

GLOSSOLALIA INFLUENCES ON STRESS RESPONSE  
AMONG APOSTOLIC PENTECOSTALS

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GLOSSOLALIA INFLUENCES ON STRESS RESPONSE  
AMONG APOSTOLIC PENTECOSTALS

by

Christopher Dana Lynn

A Dissertation

Submitted to the University at Albany, State University of New York

in Partial Fulfillment of

the Requirements for the Degree of

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Glossolalia Influences on Stress Response  
among Apostolic Pentecostals

by

Christopher Dana Lynn

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## **Abstract**

This study tests the hypothesis that long-term experience of Apostolic Pentecostal *glossolalia* or “speaking in tongues” reduces the reactivity of biological stress response to normal or “daily” stressors. Glossolalia is a form of religious *dissociation*. Dissociation is a universal capacity often conflated with “trance.” It refers to the partitioning of awareness associated with a variety of cross-cultural forms, from daydreaming and denial to possession trance, shamanic spirit journeys, and dissociative identity disorder.

Dissociation is believed to reduce or filter stress by mediating evaluation of potential stressors and reactivity of the mechanisms of biological stress response. Previous studies have examined these mechanisms in clinical settings and in relation to secularized dissociative phenomena, but few have attempted to evaluate the stress reducing and filtering capacities of culturally relative dissociation *in situ*. This is important, as forms of dissociation, such as meditation and hypnosis, are used in medical application for improving health by reducing stress. The current study sought to isolate a form of culturally relative dissociation in assessing its influence on biological stress response. This was accomplished through a two year investigation among Apostolics in New York’s mid-Hudson Valley.

Pentecostalism is a form of evangelical Protestantism that rose to prominence over the 20<sup>th</sup> century to become a global phenomenon. Apostolics are a traditional denomination defined by belief in glossolalia as absolutely necessary to convey acceptance of Christ. Sixty participants were sampled with regard to glossolalia, biological stress, and other relevant factors. Biological stress was measured by collecting saliva samples to measure diurnal cycles of cortisol and  $\alpha$ -Amylase production.

The data suggest that glossolalia is suggestively associated with a reduction in stress in response to normal stressors and significantly associated with positive mood and calmness. This supports a growing body of work validating the health-improving affects of religiosity and the claims of Pentecostals themselves. The broad implication of this research is that dissociation plays a role in stress-related health outcomes in religious dissociative contexts.

## **Acknowledgements**

I must thank the brethren of the Triumphant Apostolic Church of Jesus Christ and Abundant Life Tabernacle for allowing me to spend the last two years among them collecting the data reported in this study. Without their hospitality and amenability, this study would never have been possible. The pastors of both churches, in particular, have been incredibly accommodating, interested, and supportive, which made the entire effort much easier than it might have been given the lack of precedent for a study of this type.

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Additionally, he often helped reduce the anxiety that mounted when data collection slowed down by telling me that qualitative research usually takes unexpected turns and that no good cultural study is ever completed in the relatively short period of time entailed in dissertation research, that when I'm done with this, I will probably be far from done with the research. I am extremely grateful to Dr. Gordon Gallup, Jr. for welcoming me into his evolutionary psychology lab. It was in there that I was able to test some of the methods I employed in this study and to develop the interdisciplinary approach I will continue to utilize in future research and academic endeavors.

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## List of Abbreviations

AIP	anticipatory interactive planning
ASC	altered state of consciousness
ATL	Abundant Life Tabernacle
BIDR	Balanced Inventory of Desirable Responsivity
COMT	catechol-O-methioninehyltransferase
DDIS	Dissociative Disorders Interview Schedule
DDNOS	Dissociative Disorder Not Otherwise Specified
DES	Dissociative Experiences Scale
DID	Dissociative Identity Disorder
<i>DSM-IV</i>	<i>Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition</i>
<i>DSM-IV-TR</i>	<i>Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition- Text Revision</i>
DV	dependent variable
EBV	Epstein-Barr virus
EEG	electroencephalogram
EIA	enzyme immunoassay
ELISA	enzyme-linked immunosorbent assay
EPI	epinephrine
fMRI	functional magnetic resonance imaging
FMS	Faith Maturity Scale
GEI	glossolalia experiences index
GP	general population
HGG	Holy Ghost glossolalia

HPA	hypothalamic-pituitary-adrenal axis
ICD-10	<i>International Statistical Classification of Diseases and Health Related Problems, Tenth Revision</i>
IPL	inferior parietal lobe
ITL	inferior temporal lobe
LGE	lifetime glossolalia experiences
MPD	multiple personality disorder
PAW	Pentecostal Assemblies of the World
PERI-LES	Psychiatric Epidemiological Research Inventory-Life Events Scale
PFC	prefrontal cortex
PSPL	posterior superior parietal lobe
PT	possession trance
PTSD	posttraumatic stress disorder
RIA	radiometric immunoassay
RMQ	Religiosity Measures Questionnaire
SA	self-awareness
sAA	salivary $\alpha$ -Amylase
SAM	sympathetic-adrenal-medullary axis
SES	socioeconomic status
SNS	sympathetic nervous system
SOS	Salivary Oral Swab
SSC	shamanic state of consciousness
SST	Saliva Storage Tube

TAC	Triumphant Apostolic Church
TM	Transcendental Meditation
ToM	theory of mind
UPCI	United Pentecostal Churches International
WHO	World Health Organization

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## FORWARD

### *1. A BRIEF SYNOPSIS*

This dissertation is a biocultural investigation of dissociation in a naturalistic setting.

Dissociation is myriad cultural and personal phenomena, even in this one cultural setting, even in me and probably in you too. In other words, there are many types of dissociation, as will be outlined in chapter 2, all of which seem to have at the root a relationship with stress. Dissociation seems to be either a filter to prevent potential stressors from triggering actual stress or a means to reduce the experience of stress. The following chapters are an investigation of this concept. The culmination of this investigation is a test of the candidate mechanisms for this stress mediation performed in two populations of Pentecostals. The form of dissociation examined is speaking in tongues or *glossolalia*, which is God speaking through initiates. Based on studies of other forms of dissociation, such as meditation, it is believed that what is otherwise the regular maintenance of a relationship with God reaps numerous benefits, among which is improved health. Because health is also culturally defined but linked in many ways to stress, this investigation focuses on stress, or how this relationship with God may benefit health by reducing or mediating stress. In appraising the dissociation concept in general, this may elucidate the mechanisms by which the utilization of both normative universal and culturally relative forms of dissociation mediate stress. For Pentecostals, this may shed some light on the natural laws devised by God.

Though this study benefits both science and religion, there is a history of tension between the two that undermines the value of belief and scientific method. As outlined in the following section, this study is important in ameliorating at least some of this tension.

## *2. RELIGION AND SCIENCE*

One of the objectives of this study has been to bridge the schism between religion and science. This is important for the development of a relationship whereby continued and future collaborative research may occur. It is also important because science and religion are functionally separate phenomena. When I began the qualitative portion of the study, there was absolutely no resistance from church brethren. For Pentecostals, an interview about their religious experience is an opportunity to testify, something they make a purposive practice of. It is an opportunity to spread the good word, and, for most, I sensed no holding back or fear of judgment in their interviews with (testimonials<sup>1</sup> to) me. The stories were remarkable. Within five minutes of beginning my very first interview, at an outside table in front of Dunkin Donuts with strangers sitting at another table only a few feet away, my male informant divulged a history of childhood sexual abuse and subsequent drug use and began crying. Another informant told of the ‘signs and wonders’ (alluding to Mark 16:17-18 [King James Version], whereby true believers will experience miracles attesting to the power of God, leading to the labeling of such groups, many of whom are Pentecostal, as ‘sign-followers’—e.g., snake handlers) that had guided him, including strangers who showed up and presaged his future fortunes then were never seen again and prescient dreams that had guided his move to the town we were in. Still another told of her former occupation as a reiki healer, the demons she had taken on in healing others, and their eventual spectral haunting of her mirrors. She became terrified of her own home and enlisted the assistance of her reiki master to purge it, which proved unsuccessful. Eventually, a friend took her to one of the Apostolic churches in this study, and, though she was skeptical, she had an immediate conversion experience that was so utterly transcendental<sup>2</sup> as to remove any doubt for her of the reality of this experience or

any fear of being judged for sharing it with others. She said, “Do you know that love you feel when you look into your children’s eyes or you feel when you watch them sleep? The experience of being filled with the Holy Ghost is a million times more powerful than that.” She began speaking in tongues during the church service and continued throughout the drive home and for several hours thereafter. Additionally, the son of her friend, who is not a regular member of the church but only occasionally shows up, was simultaneously blessed with the ‘gift of interpretation,’ the ability to understand tongues, and provided a running translating for the duration of her first experience, though he has not received this gift since; and it is one rarely seen nowadays, according to one elder.

Yet when I began the quantitative portion of the study, people’s guards finally went up. The introduction of questionnaires and the collection of biological samples drew skepticism and hesitation, but this didn’t start until I had been among them for over a year. This was beyond testifying and, as I discerned through discussions with the brethren, perhaps concerned them because they were less familiar with it and so felt that their subjective interpretations might be undermined. As some put it, they were concerned God would be reduced to biology. I began this research with an evolutionary perspective but not one that explains God in biological terms. Rather, it is one that views evolution and divinity (whichever God, gods, spirits, or forces to which one subscribes) as inextricably bound together. Psychoneuroimmunological studies of faith suggest that belief in God is associated with positive health outcomes. The reductive nature of biological science tends to lead to an interpretation of this belief as an evolutionary adaptation or exaptation that has a variety of functional purposes, part of which is this health outcome, rather than the outcome of activity by a supernatural force. This is

because science by definition seeks to explain natural phenomena, so when ‘supernatural’ becomes explicable, it defaults to ‘natural.’ Yet, for those who have experienced the power of this belief, there is an equally compelling explanation. God, as the creator of all things, devised human physiology and this is the means by which the power of Jesus is manifest. While it is possible to discern natural laws of God, He and the power of faith in Him remain, also by definition, beyond the knowable.

In the contemporary political climate in the United States, religion and science have been rather exclusive of one another. While I have not heard an express creationist sermon in my time with the Pentecostals, there has been explicit intimation that scientists manipulate statistics. Certainly some scientists tend to highlight positive study outcomes and downplay negative ones—positive outcomes are simply more publishable, a phenomenon that is politic, not scientific. I have heard sermons that blast science, as I cringe in the pews, and even been pointed out as ‘the anthropologist among us conducting science,’ yet afterward I am inevitably embraced. I have never been denigrated personally. In fact, the very same pastor said to me, immediately after completing this sermon, “How is the study going?”

“Well, it’s going well,” I said, “but I need more participants.”

“Have you approached everyone here?” he asked. “These young people will be going to college and in the same situation as you, so I hope they’re participating.”

And they were. But what this told me, and what they often said to me more expressly, is that they understand the practicality of getting a degree, of getting a job, of supporting a family, and of living in this world. Just as they point out that they don’t evangelize to everyone because they know it turns some people off, turns people away

from them, and they have jobs to hold down and neighbors to get along with, they also understand the necessity of my work, whether or not they agree with it. And the very same pastor has children, also core members of the church, who are pursuing degrees in biology, one with hopes of becoming a doctor. So science is obviously not an all or nothing thing to them, and they are more complicated than the evolution/creationism schism suggests. They are, in fact, of like mind that God is about belief and that science is a method for understanding God's work, though they have never articulated it as such. But, in trying to frame this study and the importance of science and religion cooperating, I have pointed this out, and they have agreed. This is a sentiment echoed throughout the academy, as scientists from esteemed physicist Steven Hawking to Francis Collins, presidential nominee to head the National Institutes of Health, are making similar efforts. The National Academy of Sciences in 2008 published the freely downloadable *Science, Evolution and Creationism*, which flies in the face of two earlier publications in 1984 and 1999 that extolled the virtues of science and gave no quarter to creationism. This 2008 publication is an effort to explain the difference between science and religion and makes the case that acceptance of the evidence supporting the principles of evolution does not require the abandonment of a belief in God. Other national scientific organizations are taking a similar position, and with regard to this study, grant support was provided by the National Science Foundation expressly because of the contribution of this project to rectifying this schism.

These are just a few anecdotes to illustrate the negotiation that took place to ameliorate the tension between science and religion. And these negotiations took place in just two congregations, but I hope that the results of this and future studies, through

publications and presentations, will continue this progress. This dissertation addresses investigation of specific research questions this negotiated relationship made possible. The following section outlines the dissertation chapters and how each chapter addresses the research questions.

### *3. SUMMARY OF CHAPTERS*

Chapter 1 of this dissertation introduces this study and presents the model, hypotheses, methods, and rationale of the study. It also places it in the context of current research taking place in anthropology, including studies of living populations of North America in the sub-disciplines of biocultural anthropology, medical and psychological anthropology, cultural neurophenomenology, and the anthropology of religion.

Chapter 2 defines what dissociation is and why it is the focus of this study. It articulates a precise definition within the context of several fields that make use of it, including anthropology, psychology, and epidemiology. In addition to defining dissociation, several varying examples are discussed to illustrate the basic biological function of dissociation despite numerous cross-cultural differences. This is important for understanding why a state deemed to be a highly desirable manifestation of God can be compared to pathological dissociation like that of dissociative identity disorder (DID), shamanistic spirit journeys, meditation, or hypnosis.

Chapter 3 reviews the literature on biological stress response and the relationship of dissociation to stress. The biological function of dissociation appears to be as a stress filter or mitigator, so it is important to review some of the empirical research that this model is based upon. The hypotheses of this study are based on these previous findings. No similar study has been conducted outside of a lab with religious practitioners of

dissociation, so it these other studies that substantiate the interpretations of the data in this study, as well as inform some of the research design.

Chapter 4 reviews the major methods used in the social sciences to measure stress, for which the methods from this study were selected.

Chapter 5 describes why Apostolic Pentecostals were chosen for this study and provides a brief history to illustrate their importance to anthropological research in general. It also includes a vignette from my field notes from a Sunday service at one of the churches in this study that I call “the wrong Holy Ghost” that was instrumental in my formulation of the quantitative research design.

Chapter 6 outlines the research design, including the sites chosen, the data sources utilized and glossolalia typology developed from these sources, data collection procedures, laboratory analysis, and the statistical procedures used for analysis.

Chapter 7 describes the results of the quantitative portion of the study in relation to each of the hypotheses outlined in chapter 1.

Chapter 8 discusses the quantitative results and their implications. It also discusses the compromises inherent in simultaneously conducting a study with biological anthropological, ethnographic, and psychological dimensions.

Chapter 9 discusses the findings of this study in the context of a larger model of human consciousness. This is important because I assert that the biological basis of dissociation is an aspect of this model of consciousness. Dissociation is a function of the human psyche to reduce consciousness—i.e., to reduce the awareness of self and the mental states of others. The demands of our families and friends on us are in conflict, and that conflict is stressful! Chapter 9 reviews research in evolutionary psychology,

cognitive neuroscience, and anthropology that inform this model.

Chapter 10 concludes by summarizing the results and implications and outlines other applications of this model I intend to pursue. It also describes the ongoing research I am conducting with regard to self-deception that is independent of this study but integrally related in the big picture.

# 1. A BIOCULTURAL STUDY OF APOSTOLIC PENTECOSTALISM

## *1. INTRODUCTION*

This project is a biocultural investigation of ritual dissociation and its affects on stress. It examines glossolalia or speaking in tongues, a form of dissociation, among predominantly Apostolic Pentecostals in Poughkeepsie and Kingston, NY to answer the question, ‘does religious dissociation make them less stressed?’ Dissociation is a term used to identify the phenomenology of the partitioning of conscious awareness, also often conflated as trance states. Dissociation appears cross-culturally (Bourguignon 1973; 1976) and throughout human history (Clottes and Lewis-Williams 1998) in contexts that span a spectrum of normative, pathological, and chemically-induced forms (Dorahy 1999; Goodman 1988). Some manifestations are rare and culture-bound (e.g., running amok in Indonesia or arctic hysteria [Hughes 1985b]), others quotidian and universal (e.g., self-deception [Schumaker 1995]). Within all contexts dissociation seems to reduce stress (Bernstein and Putnam 1986; Bourguignon 1976; Winkelman 2000) and negotiate power relationships and identity (Bourguignon 1976; Brown 2001; Sharp 1996).

The 20<sup>th</sup> century has been associated with an epidemic of stress-related diseases (Kalia 2002; Wainwright and Calnan 2002). Dissociative practices have been extracted from religious contexts for clinical treatment of stress-related conditions, such as focused meditation from Eastern religions (Benson and Klipper 2000; Wallace and Shapiro 2006; Walsh and Shapiro 2006) and the Hindu practice of yoga (Bijlani, Vempati, Yadav, Ray, Gupta, Sharma, Mehta, and Mahapatra 2005). This secularization has made them amenable to experimental analysis, but few studies address whether clinical health benefits are also enjoyed in religious contexts.

To address whether these benefits accrue in naturalistic religious settings, I measured stress hormones in Pentecostals on a day of service when I expected all participants to have relatively high levels as a result of experiential worship—worship through activities by which to experience Christ, rather than ritual practice through a priest or other intermediary—and compared them to measures collected on a non-service day when I expected those with stress responses habituated by glossolalia experience to be less reactive to daily stressor. I grouped participants by relative rates of glossolalia experience. On service days, those with relatively more glossolalia experiences tend to attend two services and Sunday School, which means they attend church from 10 a.m. till 1:30 or 2 p.m., then again from 6 p.m. to 8 p.m. Those with less experience are either new converts, in which case they may also attend with the same frequency, or they simply are less invested and typically only attend the Sunday Midday service, from 11 a.m. till 2 p.m. These stress hormones cycle daily, so several measures were required to take this into account and establish diurnal profiles. To standardize these profiles among participants and prevent conflicts with services, samples were collected at four specific times on each day (10 a.m., 2:30 p.m., 6 p.m., and 10 p.m.). This allows comparison between aggregated measures of each day (an average of the four measures), each individual time measure, and the rate of change in hormone levels between each individual time measure.

This study seeks to test for a stress-influencing affect of dissociation in a naturalistic population, as has been established in laboratory studies. The following section outlines the model upon which study hypotheses and research design are based.

## *2. BIOCULTURAL MODEL FOR PENTECOSTAL STRESS REDUCTION*

It is inherently a biocultural study, as preliminary research has shown that cultural perception can determine if glossolalia is a positive behavior promoting spiritual inclusivity or a negative one, exacerbating tensions. It was accomplished by utilizing ethnographic data gathered through participant-observation and key informant interviews to develop relevant surveys for quantifying glossolalia and culturally-defined stress and support. Self-reported stress, religiosity, dissociation, and demographic information will be gathered using self-report questionnaires.

Apostolic Pentecostalism offers an ideal venue for such research. Pentecostalism is a charismatic form of evangelical Protestantism emphasizing personal experience with the divine. This relationship takes the form of charismata or “gifts of the Spirit,” including glossolalia, interpretation, healing, prophecy, and discernment. Pentecostalism was the fastest form of Christianity of the 20<sup>th</sup> century (Anderson 2004b; Cleary 1997; Cox 1995; Synan 2004). This success is generally attributed to Pentecostals’ direct access to God, but other forms of evangelical Protestantism boast similar access (Martin 1990; Stoll 1990). Pentecostalism is so successful, suggests Dorahy (1999), because it uniquely provides this access via a normative dissociative trance. Not coincidentally, glossolalia bears important similarities to other forms of ritual dissociation, particularly possession trance (Bourguignon 1976). It matches no intelligible language (with the exception of an occasional word), but, linguistically, it is structurally similar across cultures (Goodman 1972).

It is necessary to approach this first as an ethnographic study, to then be able to correctly measure and interpret physiological data. Pentecostal glossolalia is not merely an ecstatic practice but also defines social position and embodies denominational

ideology (Chesnut 1997). ‘Baptism of the Spirit’ is a rite of passage marked by glossolalia that signifies acceptance of the Holy Spirit. There is socialization of proper glossolalia, which is important for congregational recognition (Cleary 1997; Navarro 1998). Those who claim the “gift of discernment”—the ability to detect demonic or false tongues (Goodman 1972)—are able to distinguish those who purport to speak in tongues from those who have truly accepted God. Glossolalia can be praised as a sign that one has accepted Jesus or interpreted as the work of the devil, who “knows more tongues than all of us combined,” according to informants. Such negative appraisal may in fact produce stress rather than alleviate it.

*Figure 1.1 Biocultural model of Pentecostalism and health*

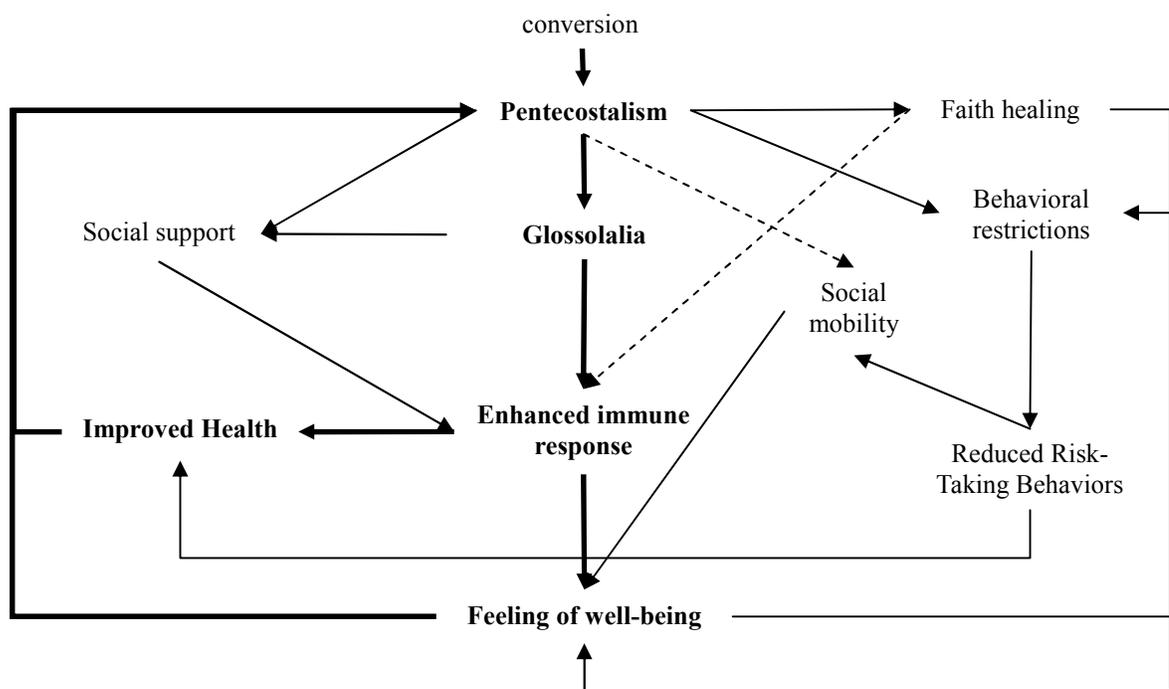
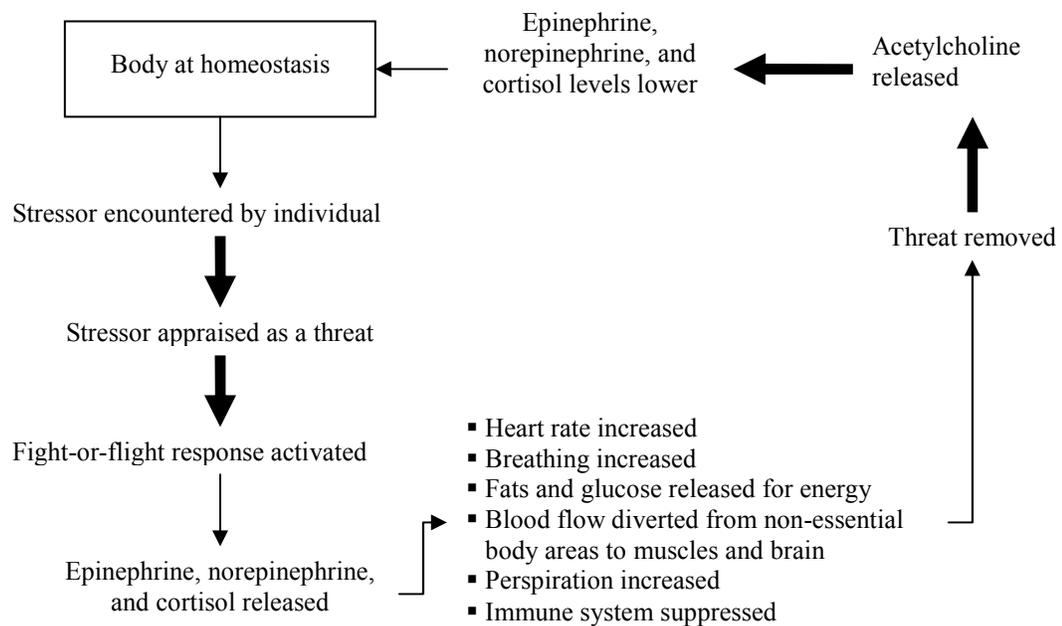


Figure 1.1 outlines the hypothetical pathways that influence health and stress and upon which the hypotheses outlined above are based. It illustrates five positive feedback pathways reinforcing membership resulting from conversion to Pentecostalism. (1) The

pathway in bold represents the one tested in this study. Acceptance of Christ is validated by glossolalia, wherein God is believed to speak through the individual. The mediated dissociation of glossolalia may influence an enhanced immune response, which will proximally produce feelings of well-being and distally improve health, both of which will encourage individuals to continue as Pentecostals and potentially convert others via testimonials of their experiences. (2) Another pathway is through the social support. Evangelical religions like Pentecostalism are attractive because of the support that joining automatically entails. Enhanced immune response may occur in terms of the hope instilled by having such support or literally the resources one needs to lead a healthy life. This again results in feelings of well-being and improved health, reinforcing membership. (3) Pentecostalism is also attractive to some because it advertises immediate amelioration of some ills through faith healing. Faith healing may literally involve mechanisms of enhancing immune response or simply produce hope and thus feelings of well-being. Either way, feelings of well-being will encourage continued membership. (4) Members are also expected to abide by certain behavioral restriction, which largely involve risky behavior, such as drinking alcohol and premarital sex. This can lead directly to improved health, as well as elevate one's esteem among peers and improve chances for vocational or status opportunities. Success in the community through social mobility would likely produce feelings of well-being toward the community, reinforcing a desire to maintain membership and possibly return the favor to another convert down the road. (5) In general, evangelical religions can be attractive because they involve immediate networking opportunities for employment and achieving social mobility, with consequential positive regard toward the community, and a desire to reciprocate.

Overall, the model suggests that, as a form of dissociative trance, glossolalia has a direct beneficial physiological affect on immune response, as has been found with other forms of dissociation (Bonura, Aloe, Becker, and Tenebaum 2007, unpublished manuscript cited in Bonura 2007; Chalmers, Clements, Schenkluhn, and Weinless 1990; Esch, Fricchione, and Stefano 2003; Flory, Salazar, and Lang 2007; Orme-Johnson and Farrow 1977; Wallace, Orme-Johnson, and Dillbeck 1990).

*Figure 1.2 Stress response and return to homeostasis*



Culturally moderated dissociation may influence how individuals evaluate potential stressors, how their bodies respond to those perceived as threatening, and the appropriate return to homeostasis, as depicted by the pathways in boldface.

Figure 1.2 illustrates the neuroendocrine response to the perception of stress. Glossolalia may mediate either just before or just after stress appraisal or both to influence the activation point of fight-or-flight. It is speculated that allostatic change may occur through glossolalia similar to that observed through focused meditation (Hoffman et al. 1982; Morrell and Hollandsworth 1986). Dissociation may effect changes in set-points for the activation of stress response (Sapolsky 2002; Stefano and Esch 2005).

Increased levels of endorphin are necessary to activate receptors that trigger nitric oxide production (Stefano 2000). Nitric oxide appears to be the primary mechanism inhibiting the vasoconstricting effect of norepinephrine that raises blood pressure and implicated in the return to homeostasis (Esch et al. 2002). In addition, the ‘exercising’ of stress response through ritual stimulation may also influence how it is deactivated, enabling individuals to return to homeostasis in an appropriate manner after an immediate crisis has been dealt with. Purposively activating and deactivating the stress response under controlled circumstances ritual dissociative behavior may habituate the system and thereby down-tune its sensitivity to generalized psychosocial stressors.

Given this model, this study tests several hypothesis that over time glossolalia experience habituates stress response to be less reactive to normal everyday stressors. This study tests this by comparing biological stress among Apostolic Pentecostals on Sunday and Monday. On Sunday, everyone is expected to have relatively elevated stress hormones due to the activity of worshipping. Those who attend both Sunday services will display more activity in conjunction with those services than individuals who don’t. Glossolalia is generally associated with this activity, as it is the ones who have accepted Christ and actively seek to speak in tongues who are the most active. Monday is a non-service day, when individuals deal simply with “normal everyday stressors.” Experienced glossolalists with less reactive stress responses are expected to produce generally lower levels of stress hormone on Monday than non-glossolalists or those with less experience.

While methodologically biocultural, this study draws from and contributes to a number of current subfields within anthropology. The following section briefly describes

those subfields and the relevance of this study.

### *3. SIGNIFICANCE OF THE CURRENT STUDY*

This investigation draws particularly on precedents from the recent reconceptualization of the biocultural synthesis, medical and psychological anthropology, cultural neurophenomenology, and Pentecostal studies.

#### *3.1 BIOCULTURAL SYNTHESIS*

Anthropological research with living populations has historically been associated with studies abroad in relatively remote field sites studying peoples in developing countries, yet the past several decades have witnessed the emergence of biocultural anthropology in and of North American and European cities. Cities are busy intersections of culture, where the ‘culture as adaptation’ paradigm gets sorely strained and provides fertile territory for examining biocultural interactions. For instance, the historic development of cities, which is at base a human cultural innovation, has always carried consequences to human health (Schell 2002). The larger context of the research outlined in this dissertation is both in and of the city. This first phase does not specifically tackle the affects of city on health, but there are clear allusions to the changes the infrastructure of city life has on the Jamaican immigrant community in this study. Future follow-up research in Jamaica will attempt to address these changes. Anthropologist/sociologist Nancy Foner (1987) has addressed the Jamaican immigration to New York from a sociological perspective, but a biocultural approach is warranted.

Additionally, the *biocultural* perspective itself, once inextricable from the holism of four-field anthropology, has fallen by the wayside as the sub-disciplines of anthropology have become increasingly specialized. As biological anthropologists Alan

Goodman and Thomas Leatherman point out, understanding “the social, environmental, and biological dimensions” of the problems faced around the world, such as those of poverty, “tests the relevance of anthropology” (1998:4). As the current study illustrates, it can sometimes be difficult to analyze culture in terms both cultural and biological, but, in failing to do so, there are dangers of missing the implications of their inherently dialectic nature. In fact, culture and biology are not separate but are reified as such for operational and analytical purposes, a point that sometimes gets forgotten or neglected. Yet Goodman and Leatherman (1998:25) point out that a newly synthesized biocultural approach must regard the dialectic of biology and culture, not merely the preceding biosocial approach that viewed humanity as a social species because of a shared biology. While there is a biological basis to much human behavior, as this dissertation will also discuss, there are also biological implications of specific cultural behaviors and subsequent implications on the culture of the biological implications.

Biological anthropologist Carol Worthman grounds biocultural research in the theory of embodied praxis. However, unlike previous philosophical and cultural approaches (cf. Csordas 1994; 1997b; 1999), she draws upon studies of human physiology, such as the recent reevaluation of human emotions (cf. Damasio 1994; 1999; Gladwell 2005), as the basis of this theory (Worthman 1999). This model includes the “notions of dual *embodiment*, which integrates developmental and processual perspectives on emotion; *local biology*, which points to intrinsic nature of biological variation; and *developmental indeterminacy*, the probabilistic relationship of biology and culture to ontogeny, given the biocultural interaction operating throughout development” (1999:42-43). And, as Worthman says, “through dual embodiment, individuals undergo

‘deep socialization,’ in which anatomy, physiology, cognition, and emotion dynamically represent the history of person-environment interactions” (1999:63-64). This conception of embodiment is extremely relevant in explaining the dispositions, behavior, and socialization of Pentecostalism, which is first and foremost a religion of bodily experience, of glossolalic practices and the implications of those dispositions, behaviors, and practices, and shall be utilized throughout this dissertation. It is also, as I will hazard to speculate, relative to the cultural universality of dissociation.

### *3.2 MEDICAL AND PSYCHOLOGICAL ANTHROPOLOGY*

This project’s biocultural integration of methodologies follows medical anthropologist William Dressler’s (Dressler 1999; 2005; Dressler and Bindon 2000) approach for assessing the relationship between cultural consonance and health. Cultural consonance, or having a lifestyle congruent with cultural expectations, is an intervening variable that moderates the influence of psychosocial stress on cardiovascular disease. This methodology involves ethnography via participant-observation and interviews of key informants, then the operationalization of variables in epidemiologic survey tools consistent with the ethnographic information (Dressler 2005). Though much medical anthropology research tends to be primarily cultural, “without biological measures as both outcomes and potential confounders it would have been difficult for Dressler to argue that cultural consonance actually makes a difference in physical health. Conversely, culturally sensitive instruments and appropriate analytical tools for characterizing cultural similarities were essential to capturing intracultural agreement and variation” (Hruschka, Lende, and Worthman 2005:10). In the same way, it is impossible to detect health advantages of glossolalia without biological measures, but these measures

are only sensitive enough if they are designed in a culturally relative manner.

By utilizing Dressler's methodology, this study draws on and contributes to medical anthropology, and by the focus the cognitive dimensions of stress—i.e., on psychosocial stress—it also engages psychological anthropology. This biocultural approach to cultural psychology is the essence of cultural neurophenomenology, especially in the focus on religious sub-domains.

### *3.3 CULTURAL NEUROPHENOMENOLOGY*

The term “cultural neurophenomenology,” coined by anthropologists Charles Laughlin and Jason Throop (2003; 2006), refers to the integration of cultural phenomenology, like that practiced by anthropologist Thomas Csordas (1990; 1997b; 1999), and neurophenomenology, as exemplified by Newberg and anthropologists Eugene d'Aquili and Laughlin (Laughlin, McManus, and d'Aquili 1990). It is an effort to provide language relevant to bridging the mind/body schism still perceived to exist in the so-called ‘hard’ sciences. Through the model of cultural neurophenomenology, say Laughlin and Throop, the confluence of individual experience, culture, and extramental reality as practiced can be simultaneously addressed (2006).

The concept of embodiment elaborated by Worthman is also utilized in cultural phenomenology and, thus, in cultural neurophenomenology. With embodiment, culture is actually ‘inscribed’ or manifest in the body. This concept derives from the phenomenological philosophy of Maurice Merleau-Ponty. Merleau-Ponty saw the body as a “setting in relation to the world” (1962:303) and human consciousness as the projection of the body into the world (Csordas 1997b:7). French sociologist Pierre Bourdieu's work paralleled Merleau-Ponty in evaluating the socially informed body as

the “principle generating and unifying all practices” (Bourdieu 1977:124) and viewing consciousness as a system of strategic calculations in a context of objective potentials (Csordas 1997b:7). Csordas utilizes this conception in his evaluation of the embodiment of charismatic healing (1990; 1997b; 1999; 2002), work that has particular relevance to the current study.

The embodiment of experience has universal relevance, but religious sub-domains like glossolalia in particular cannot be properly explained without this theoretical concept. Religious behaviors have always been of interest to anthropologists, and glossolalia and other Pentecostal behaviors are no exception.

### *3.4 ANTHROPOLOGY OF RELIGION*

There has been a good deal written about global Pentecostalism (Anderson 2004b; Austin-Broos 1997; Chesnut 1997; Cleary 1997; Cox 1995; Garrard-Burnett 1998; Martin 1990; Miller and Yamamori 2007; Synan 2004; Zubieta, Heitzeg, Smith, Bueller, Xu, Xu, Koeppe, Stohler, and Goldman 2003) but less about American Pentecostals. Nevertheless, there are a few works pertinent to this study, including several on (Wacker 2003)black Pentecostalism (Paris 1982, Sanders 1999, Simpson 1974, Williams 1984) and a few on Jamaican Pentecostalism (Austin-Broos 1997, Wedenoja 1980). Additionally, Csordas’s (Csordas 1997a; Csordas 1997b; Csordas 2002) research, though focused on Catholic Charismatics, a movement that emulates Pentecostalism, is also relevant and concerns groups from a similar region of the Northeastern United States. He has rigorously documented the embodiment of charismatic phenomenology among practitioners as being core to defining self. Charismatic practices are central to many marginal religions but had largely disappeared from mainstream Western religions until

1901 when Pentecostalism emerged in the United States and, within a decade, spread throughout the world (Anderson 1979; Synan 2004). Members remember their first time vividly, quips one researcher, even better than the number of children they have (Chesnut 2000). Others suggest it is what all new members look toward and current members look for as a sign of Godliness (Bourguignon 1976; Goodman 1972; Goodman 1974). It is the mark of a transformation of consciousness and status in the congregation. Practitioners report that worship thereafter becomes more meaningful, fulfilling, and sincere; and those witnessed and acknowledged as baptized in the Spirit become full, recognized members. Horwatt (Horwatt 1988) has likened Pentecostalism to the shamanic complex (Lévi-Strauss 1963), particularly because of the oral-formulaic (Lord 1981) delivery of sermons, which has a trance-inducing effect (Rosenberg 1970). And like shamans, Pentecostals have been criticized as mentally unstable because of their ecstatic practices (Devereux 1961; Hollan 2000; Spiro 1997). Kay and Francis (Kay and Francis 1995) addressed this in a study of young people entering the ministry and found the contrary; glossolalists are more stable than the general population.

The preceding sections outline the precedence for studies of this kind, but it is necessary to recognize the importance of this study in general and why an anthropological perspective is appropriate to such an investigation.

#### *4. CONTRIBUTION TO ANTHROPOLOGICAL THEORY AND DISCIPLINE*

This project uniquely proposes a biocultural model by which to study dissociation and human consciousness. The study of dissociation in anthropology has suffered a lack of consistent methodology. There is a general consensus of the healing value or psychic valve function of dissociation cross-culturally, in and out of ritual context (Bourguignon

1976; Goodman 1988; Lewis 1989; McClenon 2002; Walker 1972; Winkelman 2000) and many ethnographic descriptions of such. As yet, there is no recognized means of verifying these functions. The only other study with a similar approach used the Dissociative Experiences Scale among practitioners of condomblé, who engage in dissociative trance as a primary ritual (Seligman 2005). The fact that this study found no significant difference in dissociation measures as compared to normal North Americans highlights the ineffectiveness of adding psychological scales alone to ethnographic studies of dissociation. Furthermore, several recent publications contend that with improvement in technologies for studying the brain, consciousness research is being commandeered into neuroscience labs, outside relevant cultural contexts, and a schism developing between interpretive studies of transcendent states and those tracing the neural correlates of consciousness (Charet and Webb 2007; Gray 2007; Mentor 2007; Williams 2007). The use of methodologies from several disciplines enables the current study to contribute to both interpretive and neuroscientific explorations of consciousness.

This research is part of a larger model proposing that the level of dissociation observed in humans is an evolutionary check on consciousness. The liminality of glossolalia and its physiological correlates may illustrate the human psyche's design for transformative experience (Dornan 2004; MacDonald, Cove, Laughlin, and McManus 1989). Furthermore, there is a paucity of anthropological studies of charismatic religion, let alone of North American Apostolics. Noteworthy exceptions are Csordas's work (1997a; 1997b; 2002) and Goodman's (1972) and Samarin's (1972) cross-cultural comparisons of glossolalia, though the latter are now 35 years old.

There is also a history of hostility between science and fundamentalism in the

United States, perpetuated on both sides, that this investigation will contribute to mending. This project is making no claims about the existence of God but is seeking to understand a pathway of stress-relief, which may also be interpreted as the natural law through which God works. One key informant states that it may help people to understand that what they do “is not man-made.” Finally, this research is important because people often turn or return to non-secular avenues of health-enhancement if they become dissatisfied with biomedical interventions (Bash 2004; Tacey 2004; Walter 2002), and the results of this study may be useful in supporting efforts to implement dissociative practices among populations at risk for stress-related diseases.

These contributions are important to humanity, and anthropology uniquely provides the methodology to conduct such an investigation.

##### *5. SUMMARY*

Ritual dissociative or trance practices are found cross-culturally and throughout history, but little attention has been paid them as a cultural practice that may also be biologically adaptive. Dissociation is widely believed to reduce stress. This project tests the hypothesis that such ritual dissociative behavior as glossolalia reduces the reactivity of biological stress response over time. Preliminary research revealed the emic view is that both God and the devil can cause people to speak in tongues, with potentially opposing outcomes for stress, illustrating the importance of integrating ethnographic, biological, and psychological approaches. Quantitative investigation involved measures of biochemicals of stress hormone and administration of questionnaires to collect self-reported stress, religiosity, and dissociation data. Cortisol was analyzed relative to culturally-defined stress, supports, and glossolalia. All other things being equal,

acceptable glossolalia over time is hypothesized to reduce overall stress on a non-service day. Questionnaire and interview data was used to establish baseline environmental stressors, individual stress appraisal, and dissociation and to control for other sources of stress-reduction, such as basic religious faith.

## 2. WHAT IS DISSOCIATION?

The previous chapter outlined the research goals, general strategy, and context for this study of naturalistic dissociation. This chapter defines what dissociation is and distinguishes it as a psychological concept, its phenomenology, and, briefly, its neural correlates. Then it discusses dissociation from a cross-cultural perspective. This context is important to understanding what characteristics all forms of dissociation have in common, as well as what is distinctive and therefore not appropriate to compare. In this chapter, particular attention will be paid to forms used in shamanism, possession trance, dissociative identity disorder (DID), and the focus of this research, speaking in tongues.

The following section discusses the varying definitions of dissociation used and establishes one that is relevant to this study and cross-cultural comparisons.

### *1. DEFINITIONS*

The word *dissociation* primarily describes the psychology of experiences and behaviors available to the mind but kept out of awareness either temporarily or permanently. Commonly experienced examples include those of athletes, who dissociate feelings of pain or exhaustion to continue competing, or of abuse victims, who dissociate memories of trauma to go about their daily lives. There are also culturally relative examples or those experienced only by people in particular cultures. These include religious practices and health-oriented behaviors, such as shamanic soul journeying, possession trance, meditation, and hypnosis. Many terms have been used in describing similar phenomena, such as dis-association, trance, denial, and, with regard to culturally relative states, possession. The terms dissociation and trance in particular are often conflated. Cultural anthropologist Sheila Walker, in her seminal treatment on religious possession trance,

*Ceremonial Spirit Possession in Africa and Afro-America*, differentiates between trance and possession as follows: “Trance is the scientific description of a psychological and physiological state in Western terminology, whereas possession is the folk explanation, in more philosophical terms, for the same type of state” (1972:3).

In the following sections, I further refine this definition by suggesting the term *dissociation* best describes the psychological state, *trance* the phenomenological or affective, and *deafferentation* the physiological.

### *1.1 DISSOCIATION*

Dissociation is a partitioning of conscious awareness that is both unexceptionally quotidian and remarkably unique. *Merriam-Webster's Collegiate Dictionary*, 10<sup>th</sup> edition, defines it as “the separation of whole segments of the personality (as in multiple personality) or of discrete mental processes (as in schizophrenias) from the mainstream of consciousness or of behavior.” It is a phenomenon historically intertwined with hysteria, suggestibility, and hypnosis. Indeed, hypnosis is a form of dissociation, and some (cf. Charcot 1889; de la Tourette 1887; 1891) have thought hypnosis symptomatic of hysteria. The term hypnosis was coined to distinguish that characteristic of hysteria that was believed to be a neurophysiological phenomenon and not just a product of imagination (Braid 1843). Many believed that such hysteria was largely the product of suggestion rather than neurosis but that this suggestion was heightened by what pioneering American psychologist and philosopher William James (1890) termed “hypnotic trance,” “hypotaxy,” “dissociation,” or “trance-like state” (cf. Charcot 1889; Janet 1894a; Prince 1905). Eminent French psychiatrist and philosopher Pierre Janet (1925) and founder of group psychotherapy Paul Schilder (1956) likened dissociation to a derivative of natural

sleep. Psychologist Ernest Hilgard (1973), famous for his metaphor of brain mechanism that serves as a “hidden observer” meditating memory in hypnosis, prefers the term “neo-dissociation,” which emphasizes the flexibility of the phenomenon.

Dissociation is often discussed under the spectrum of “altered states of consciousness” (ASC). ASC “are conditions in which sensations, perceptions, cognition, and emotions are altered” (Bourguignon 1979:236). Clinical psychiatrist Arnold Ludwig (1966:227-230; 1968:77-83) outlined several characteristics of ASC, which Walker (1972:13-14) summarized:

1. Alteration of thinking  
—inward shift in direction of attention; disturbed memory, concentration, judgment.
2. Disturbed time sense.
3. Loss of control  
—may gain greater control or truth through loss of conscious control, e.g., identity with source of greater power.
4. Change in emotional expression  
—less control, inhibition; more primitive, extreme emotions; may be detached.
5. Body image changes  
—depersonalization, body-mind schism, dissolution of boundaries between self and others or universe, feeling of oneness or transcendence.
6. Perceptual distortions—hallucinations and pseudohallucinations  
—content of perceptual aberrations determined by culture, group, individual, [and]/or neurophysiological factors. May represent wish fulfillment, expression of basic fears or conflicts, or phenomena of little dynamic importance.
7. Change in meaning or significance  
—attach increased meaning or significance to subjective experiences, ideas, perceptions in such state; often feelings of profound truth, insight, illumination. This feeling of increased significance or importance is one of most important features of religious or mystical consciousness, and is probably a major feature in stabilizing many religious groups.
8. Sense of ineffable  
—because unique, subjective experience, hard to communicate nature or essence to one who has not undergone it; tendency not to remember.
9. Feelings of rejuvenation, renewed hope.
10. Hypersuggestibility  
—increased propensity of person to accept and/or automatically respond to specific statements, i.e., commands or instructions of leader, or to non-specific cues as cultural group expectations. The distinguishing feature of these states is

the hypnotized subject's emotional conviction that the world is as suggested by the hypnotist rather than a pseudo-perception based on this suggestion. There is also a reduction of the effective range of the critical faculties with an attendant decrease in the capacity for reality testing, i.e., an inability to distinguish between subjective and objective reality. This situation creates a compensatory need to bolster such faculties by seeking props and guidance in an effort to relieve the anxiety usually associated with such a loss of control. There is increased reliance on an authority who is seen as omnipotent.

With the 'dissociation of self boundaries', an important feature of ASC's, the subject has a tendency to identify with an authority [in possession this would be the god or spirit, priest, and total community] whose wishes and commands are seen as the individual's own. As a result of all these factors there occurs a monomotivational or supramotivational state in which the person strives to realized in concrete behavior, the thoughts or ideas he experiences as subjective reality. This subjective reality is determined by the expectations of the authority figure or group as well as by the individual's own wishes and fears. In an altered state of consciousness in which external direction and structure are ambiguous or ill-defined (e.g., panic, acute psychosis) the person's internal mental productions are his major guide in the perception of reality, and thus have a large role in determining his behavior. In this case the subject is more susceptible to the dictates of his emotions and the fantasies and thoughts associated with them than to the directions given by other people.

All human societies utilize ASC in some form, as noted by psychological anthropologist Erika Bourguignon (1979:233). Yet this is a broad rubric, and there are a number of large groupings of ASC that must be distinguished, including "a secular type...(such as drugs, fever, hysteria, schizophrenia) and two religious or supernaturalistic explanations: soul absence and possession" (Bourguignon 1976:10). ASC are achieved in numerous ways, including but not limited to the use of dancing, repetitious rhythms, sensory and sleep deprivation, fasting, meditation, and the ingestion of psychoactive plants and drugs. Many of these characteristics are true of dissociation as well, hence a tendency to use the terms interchangeably. For instance, while dissociative features are diagnostic of schizophrenia in some cases, it is not a dissociative disorder. In other words, in the cultural modes of dissociation that will be discussed in this chapter, dissociation is the prevailing psychological state.

In France, Moreau de Tours (1845) was the first to use the dissociation (*désagrégation* in the original French) concept in this manner<sup>3</sup> (van der Hart and Horst 1989), but most clinicians and researchers dealing with dissociative disorders today follow Janet's (1889) elaboration of it as a coping mechanism to deal with trauma. In the clinical varieties it is a psychological pattern of unconscious behavior developed at a very young age in the face of severe trauma. Within this *psychiatric-adaptive* paradigm (Seligman and Kirmayer 2008), the concern is to detect dissociative disorders as defined by the *Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition-Text Revision (DSM-IV-TR)* (APA 2000), the U.S. gold-standard for the diagnoses of psychiatric pathology. The *DSM-IV-TR* states that "the essential feature of the Dissociative Disorders is a disruption in the usually integrated functions of consciousness, memory, identity, or perception. The disturbance may be sudden or gradual, transient or chronic" (APA 2000:519). There are five *DSM-IV-TR* dissociative disorders: dissociative amnesia, dissociative fugue, dissociative identity disorder (DID), depersonalization disorder, and dissociative disorder not otherwise specified (DDNOS). Yet it recognizes that dissociation is not inherently pathological, and a cross-cultural perspective should be employed in the evaluation of dissociative disorders because of the ubiquity and variety of dissociative elements in cultural practices throughout the world (APA 2000).

However, such psychological definitions are deficit-oriented by default and imply an ideal integration (Waller, Putnam, and Carlson 1996). Anthropologist Morton Klass (2003) points out that it is the role of medical experts to define and treat illness, not wellness; psychiatrists define mental phenomena with the ultimate goals of diagnosis and treatment of mental health problems. Nevertheless, one must be aware of the

inconsistency sometimes found in the use of the term dissociation, as it is often implies pathology and does not distinguish “dissociation” from “dissociative disorder” or “pathological dissociation.” For example, Eve Bernstein-Carlson and Frank Putnam, among the foremost psychiatric experts on dissociation, define dissociation as “a lack of the normal integration of thoughts, feelings, and experiences into the stream of consciousness and memory” (1986:727).

Despite this sometime confusion, many recognize dissociation as a fundamental aspect of the human psyche (Bowers and Meichenbaum 1984; Dorahy and Lewis 2001; Hilgard 1973; 1986; Schumaker 1995), as will be discussed further in chapter 8. Indeed, it was the basis of Janet’s psychological model, which was displaced as the model for American psychiatry by Freud’s repression model. Many definitions tend to emphasize this influence. For instance, Yvonne Dolan, Ericksonian hypnotherapist and director of the Institute for Solution-Focused Therapy, defines it as “the mental process of splitting off information or systems of ideas in such a way that this information or system of ideas can exist and exert influence independently of the person’s conscious awareness” (1991:114). The *Psychiatric Dictionary* similarly defines dissociation as

the segregation of any group of mental processes from the rest of the psychic apparatus. Dissociation generally means a loss of the usual interrelationships between various groups of mental processes with resultant almost independent functioning of the one group that has been separated from the rest. [Hinsie and Campbell 1970]

Another emphasizes stream of thought separation but maintains the importance of this separated information, stating that dissociation is “a psycho-physiological process whereby information—incoming, stored, or outgoing—is *actively deflected from integration with its usual or expected associations...*[allowing] *a discernible alteration in a person’s thoughts, feelings, or actions...an experience that may or many not be*

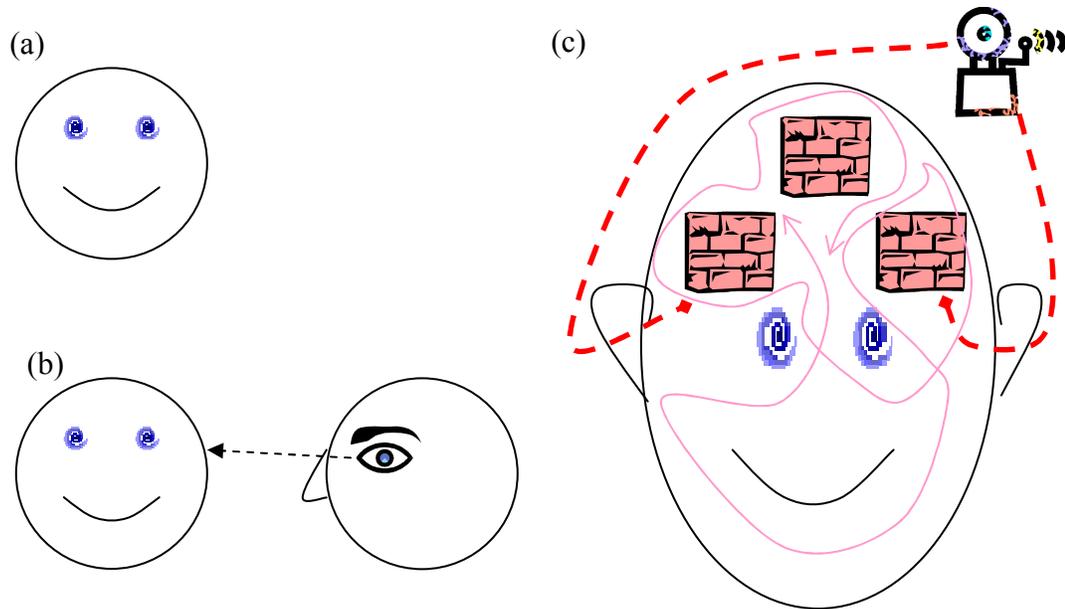
*considered psychopathological*' (West 1967:890).

On the other hand, the *anthropological-discursive* paradigm (Seligman and Kirmayer 2008) generally views dissociation as a social, rhetorical phenomenon framed in relations of power, agency, social space and embodiment, a performance *emic*, and as an adaptation that is only pathological under extreme and often culturally-relative circumstances (cf. Bourguignon 1976; Goodman 1988; Walker 1972). It does not presume the psychiatric ideal of integration as the norm and, indeed, postulates instead that a lack of integration may merely be a by-product of focused attention (Seligman and Kirmayer 2008). To paraphrase Bourguignon (1976), when severe dissociation occurs in an individual due to a history of traumatic experiences, a fine line exists between being personally adaptive and socially maladaptive. That line may be crossed when an individual's dissociation is so severe as to not be confined to culturally-condoned parameters and leads to social marginalization or institutionalization. It is therefore hypothetically possible, though not verified, that a community which ceremonially practices a form of dissociation, such as spirit possession, may provide a supportive, complementary environment for someone prone to trauma-induced, severe dissociation. The opposite could be true in European and U.S. communities, where such people find themselves marked as outsiders or mentally ill. And it is true that even in communities that practice dissociation ceremonially, those who cannot contain their dissociation to ceremonial contexts are similarly marked.

Psychiatric anthropologist Richard Castillo (1995) indicates that institutionalized forms of dissociation, such as those of yoga, create alternative neural pathways of long-term potentiation through repeated use. In this sense, dissociation is less an altered state

of consciousness than an alternative one and not

Figure 2.1 Different conceptual levels of dissociation, trance, and deafferentation



*Dissociation* is a personal psychological experience of an alternative state of consciousness wherein there is some degree of partitioning of awareness. In (a) this is represented by a hypnagogic state, though dissociation is not always externally visible or apparent. *Trance* is the observably affective state, as seen in (b). *Deafferentation* is the neural corollary of dissociation, wherein incoming or afferent neural signals are blocked. In (c) the incoming auditory sensory information (signified by red dashed path) is blocked from consciousness while other signals (pink solid path) move freely around.

necessarily “disconnected from the mainstream.” The dissociation phenomenon encompasses forms that are both culturally normal and abnormal (Walker 1972) and that can be short-term, infrequent aberrations or reinforced through long-term potentiation. Sometimes information is rigidly separated and results in amnesia; sometimes it is only partially separated. Haitian *vodou* (voodoo) and DID offer striking examples of the former, whereas hypnosis and meditation are good examples of the latter. Think of an office space comprising cubicles separated by partitions that can be moved around in a variety of configurations, interspersed with several dedicated offices that have more

permanent walls. Information flows over, around, and through these separators, with various degrees of ease. The partitions can be unconsciously moved to divert or block streams of information (see Figure 2.1).

The permeable and semi-permeable partitions are what Hilgard's (1973; 1986) neodissociation was meant to capture, which distinguished it from a permanent partitioning as seen, for example, in cases of autism and schizophrenia. Hilgard drew directly on Janet but felt Janet's focus overemphasized pathology, so the term neodissociation was also meant to suggest the phenomenon's normalcy and universality (van der Hart and Horst 1989).

To rectify these inconsistent uses of the dissociation concept, I refer to it inclusively as follows:

- *Dissociation is the psychological phenomena of alternative states involving varying degrees of partitions of awareness.*
- *In some individuals these states may be permanent and separated from the mainstream of normal consciousness, though this distinction is culturally relative.*
- *In other cases it involves varying degrees of permeability and impermanence.*
- *It is the experienced mental state and causative of the visual or apparent state of trance, though a visual trance is not apparent in all states of dissociation.*
- *Neurophysiologically, dissociation is not a unitary process and, thus, to avoid confusion it is referred to more precisely at the neural level as deafferentation.*

Trance Institute director Dennis Wier clarifies the importance of this by pointing out that dissociation as commonly defined circumscribes three types of phenomena that are functionally different. These are abstraction, autonomous multiprocessing, and

trance. Autonomous multiprocessing is the splitting of cognition into two portions, with the dominant path remaining in awareness and the latent path being subconscious. The rate and sequence of these latent pathways may to some degree reflect thought processing efficiency or intelligence. These functions are based, he says, in that

dissociation is the mechanism by which processing becomes distributed to dominant and latent sequences. When both dominant and latent sequences are continuing at the same time, then there is parallel processing. The latent sequence becomes the trained automaton. Multiple parallel information processing, with or without awareness, seems to be at the basis of influencing cognition, affect and behavior.

What distinguishes the dominant from the latent sequences of dissociation is the disabling or enabling of certain cognitive functions from the latent sequence. [Wier 1996:55-56]

Dissociation as abstraction, says Wier, is the basis for learning, as signals can exist longer latently than in a dominant pathway. This is energetically more efficient, though in latent pathways, cognitive functions such as critical thinking are disabled.

Wier suggests reading and scratching one's arm simultaneously as an example of this autonomous multiple parallel processing (1996:56-57). Perhaps a better example is a musician playing an instrument—a guitar for example—while singing. Furthermore, both playing guitar and singing could be autonomous while dominant attention is focused on looking at the audience or a band mate or performing some movement on the stage. The trance is then a further extrapolation of this autonomous behavior, as will be discussed in a section below. Wier's model for how it occurs, which mirrors neurological models developed to describe transcendence (d'Aquili and Newberg 1993), will also be discussed in a subsequent section.

Dissociation comes in many forms that, in some cases, are difficult to rectify as part of a universal experience because they are so different. Often these differences are because they are at opposing ends of the 'dissociation continuum.'

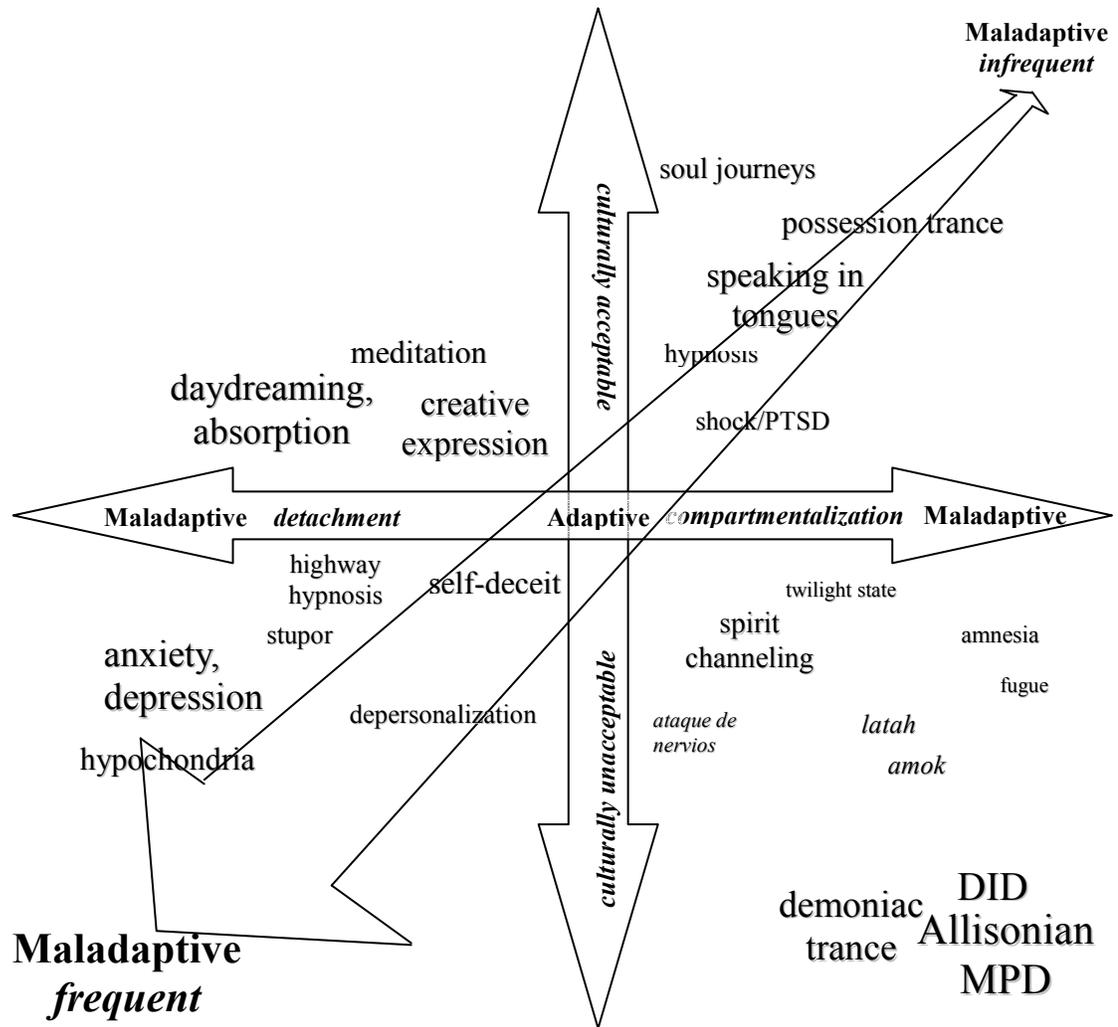
### *1.1.1 The dissociation continuum concept.*

Dissociation has been described as comprising a continuum of experience (Bernstein and Putnam 1986; Braun 1986; Goodman 1988:21; Ross 1985; Shor, Orne, and O'Connell 1962; Spiegel 1963; Tellegen and Atkinson 1974). At one end lay culturally instructed and ritualized types—structured by society—such as the shamanic spirit journeys of visionary trance or the possession trance found in the Caribbean—while at the other are the aberrant and pathological types like DID and demoniac possession. Positions are determined by the degree to which a society approves of and invokes dissociation. The forms that are taught as an explicit part of cultural emics or belief systems and involve communities that converge expressly for possession ceremonies and often dance, sing or chant, eat, drink, and socialize. At the other end of the spectrum, dissociation is unconsciously structured by the individual. For example, victims of DID are socially marginalized. Because they are frightened and ashamed of sharing their dissociative experiences with others, the emic of DID is a complete contrast to the celebratory nature of Haitian possession trance.

While this continuum is not wrong, it is incomplete. It is generally represented as a simplified linear model, though it has long been recognized as multi-dimensional (cf. Spiegel 1963), and many theorists (Allen 2001; Brown 2002; Cardeña 1994; Holmes, Brown, Mansell, Fearon, Hunter, Frasquilho, and Oakley 2005; Putnam 1997; van der Kolk and Fislser 1995) have attempted to address the confusion the unitary model has caused by identifying different types of dissociation (Brown 2006). It is better conceived as a three-dimensional field or spectrum, as illustrated in Figure 2.2, because its forms vary widely in cultural integration, persistence, and intensity. As can be seen, culturally acceptable forms tend to be both functional for the individual and supported by the group,

as with Pentecostal speaking in tongues or the social support granted victims suffering

Figure 2.2 Multi-dimensional continuum of dissociation



PTSD (post-traumatic stress disorder), whereas culturally unacceptable forms *may* be functional for the individual but can be shunned or criticized at the group level and even result in institutionalization, as with DID or Puerto Rican *ataque de nervios* (Lewis-Fernández 1994). But the intensity, frequency, and particularly the context of dissociation will often determine cultural acceptability, such that even acceptable forms

like speaking in tongues, when done too intensely, too frequently, or in the wrong context, might be interpreted as pathological (or demoniacal instead of divine). Additionally, two qualitatively different forms are distinguished in this dissociation model—those that constitute degrees of depersonalization or *detachment* and those that involve *compartmentalization* (though both of these are subsumed by the office partitions concept of dissociation). Also, if dissociation is adaptive, then sub-normal will also be degrees of pathology, as depicted by anxiety, depression, and hypochondria, which, arguably, represent individuals who do not successfully filter out potential stressors.

For most people, dissociative experiences are primarily byproducts of focused attention (autonomous multiprocessing) pastimes such as daydreaming, reading, watching television, driving, creating art, or playing a sport. In these examples, attention is being focused on a mental train of thought or task, and other stimuli are “tuned out” or dissociated from conscious awareness. Healthy people dissociate in such ways every day of their lives. In fact, I hypothesize that not only can excessive, unsupported dissociation be maladaptive, so can an inability to dissociate (Lynn 2005). That is to say, problems should be evident in people with too much consciousness (as discussed further in chapter 4), who cannot dissociate enough. Anxiety disorders and hypochondria, for instance, may involve awareness of self to a debilitating degree. Association between anxiety, hypochondria, and dissociation should be testable indirectly through questionnaires comparing sufferers of the former and non-sufferers as well as directly through comparisons of brain scans while ostensibly focusing on something besides self. One would expect more intense, persistent patterns in the prefrontal cortex in sufferers whose perseverating focus is on self even when instructed to direct their attention elsewhere.

Intermediate between these extremes is a range beginning with few, very mild dissociative experiences and progressing through many, severely dissociative experiences. Mild experiences are those of focused attention (e.g., daydreaming) from which a person may easily be distracted. Severe dissociation involves amnesia.

While there are a variety of types of dissociation, it is generally considered to be biologically based and, when not aberrantly extreme, functional on some level.

### *1.1.2 Functions of dissociation.*

I propose that dissociation is a psychological function of stress response, be it the stress of trauma, culturally-mediated, or even subtle, idiosyncratic forms. It is this function that distinguishes dissociation from other ASC. Dissociative states are a subset of ASC for which Ludwig outlines seven functional modes. These include

- (1) the automatization of certain behaviors, (2) the efficiency and economy of effort, (3) the resolution of irreconcilable conflicts, (4) escape from the constraints of reality, (5) the isolation of catastrophic experiences, (6) the cathartic discharge of certain feelings, and (7) the enhancement of herd sense (e.g., the submersion of the individual ego for the group identity, greater suggestibility, etc.). [1983:93]

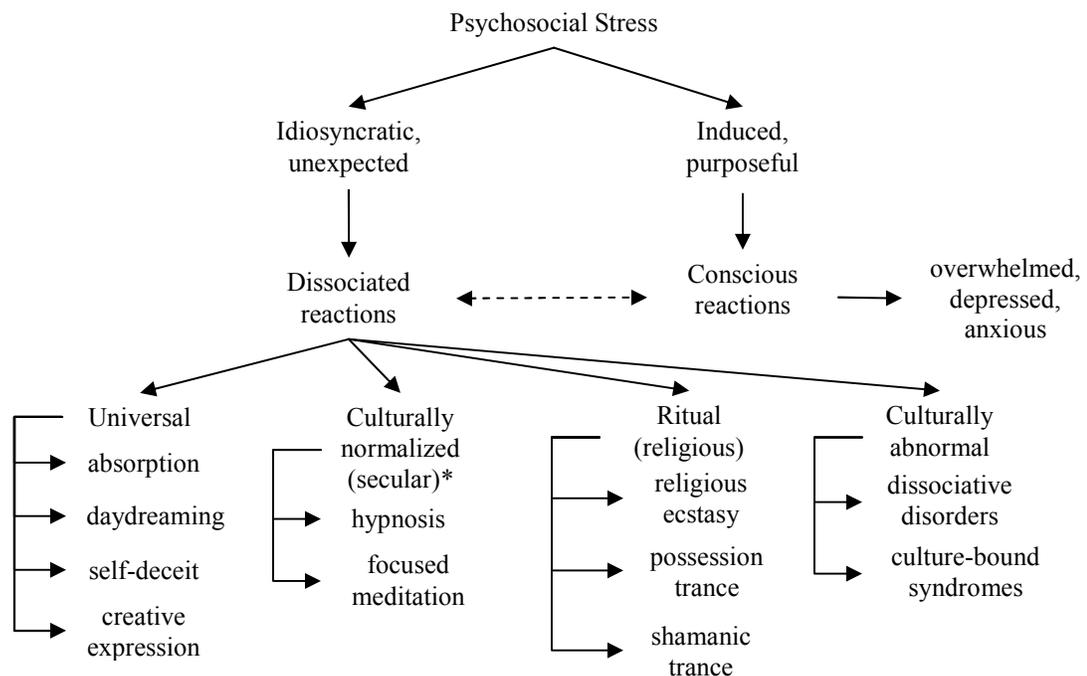
These are all stress-reducing by either minimizing stress or deflecting potential stressors. Sometimes this stress is framed in relation to issues of power (cf. Sharp 1996). For this reason, psychologist John Schumaker calls dissociation a censoring system that “*filters* vast amounts of information in order to diagnose data sets that are potentially *noxious* to the individual...to greatly reduce the complexity of incoming and stored information in such a way that a sense of order is more likely” (1995:49). The mechanisms of dissociation may partition alarming information or stimuli away from awareness or elevate the threshold for neuroendocrine activation in determining what the brain evaluates as alarming. In other words, there may be denial or selective perception

of alarming realities *or* actual recognition of them but the ability not to “stress out.” It enables us, in other words, to simultaneously accept two sets of contradictory information, an ability termed *trance logic* (Orne 1962:54). “Dissociation,” says Schumaker, “is the cognitive faculty that allows us to alternate in purposeful ways, and in varying degrees, between reality orientedness and a lack of reality orientation, while never actually abandoning an awareness of reality at the unconscious level” (1995:52).

As I have illustrated in Figure 2.3, there are three dissociative responses to stress—(1) universal but not culturally moderated, (2) culturally relative and validated secular or religious, and (3) culturally aberrant. Within shamanic cultures, dissociation is employed in the service of client and communal healing. It is an ethnomedical tool of shamans, akin to hypnosis use by psychotherapists, as pointed out by structural anthropologist Claude Lévi-Strauss (1963). In possession trance cultures in which spiritual leaders and initiates are taken over by spirits, the individual is absolved from responsibility for behavior exhibited while possessed. Drawing on Freud’s hydraulic theory of repression, the functionalist interpretation conceptualizes dissociation as a ritualized valve for venting personal and social pressure in an acceptable context. Dissent toward authority figures otherwise considered inappropriate for an individual to express is acceptable and even expected from a spirit. In this way, social problems can be voiced and changes implemented without individuals bearing the brunt of social disapproval (Bourguignon 1976). This interpretation admittedly ignores discourse on malevolent shamans and *bokors* (vodou priests that practice black sorcery) that use the same dissociative behavior to exact personal or purchased revenge (cf. Davis 1986; Taussig 1987). Demoniac possession utilizes a similar mechanism without the social approval or

mediation (Goodman 1988). In DID, dissociation is a coping mechanism to deal with developmental trauma that becomes problematical in adulthood when the trauma has ended. This model of dissociation does not posit a closed and coherent system; rather this anthropological-discursive paradigm holds that dissociation is a biological capacity that is culturally and psychologically malleable.

Figure 2.3 Biocultural dissociative response to stress



Dissociation is an embodied state or body hexis, though it is not always apparent. It is functionally distinct from other forms of ASC yet a fundamental aspect of the human psyche. Many forms are culturally relative, though in some form or another, dissociation appears universally. Using the anthropological-discursive model of dissociation, I have conceived of a biocultural model in which its fundamental role is as the psychological aspect of biological stress response. However, though often conflated with trance, I propose that trance is merely the affective appearance in some forms of dissociation. It is

important to recognize that dissociation occurs even in the absence of trance but that trance is a common occurrence. The following section outlines the distinctive features of trance, which will be relevant when discussing Pentecostal worship, as trance is a common feature of much religious practice. Glossolalia is merely a sub-domain of religious behavior that takes place in some trances—not all trances triggered by Pentecostal practice involve glossolalia.

### *1.2 TRANCE*

Trance is the phenomenological—i.e., the apparent, affective, or visible—state of dissociation. *Merriam-Webster's Collegiate Dictionary*, 10<sup>th</sup> edition, defines trance as “a state of partly suspended animation or inability to function...a somnolent state (as of deep hypnosis)...a state of profound abstraction or absorption.” Wier defines trance as “a state of limited awareness.” Both of these definitions are problematical because somnolent states, abstraction, and limited awareness are essential elements as well as effects of trance (1996:18-20). This is why it is important to distinguish dissociation as the psychological state and trance as the affective one. Thereby, dissociation is the cause that effects the trance.

To say someone is in a dissociative trance is redundant. Trance is characterized by varying degrees of “disabling of judgment, disabling or limiting of volition, decrease of body awareness including eye fixation and immobility, an increase in the vividness or number of visions or hallucinations, inability to perform some mental functions and increased ability to perform other functions” (Wier 1996:104-105). Not all of these characteristics are readily apparent, especially in experienced ritual dissociators, who can often exert more conscious control than those with less experience. Other characteristics

of trance include fixed attention, increased or decreased ability to learn, enhanced self-observation, inability to make critical judgments, increased literalism, and enhanced trance force. Literalism refers to the direct interpretation of words, which may be an artifact of focused attention. Attention is not focused on discerning the metaphoric meaning often embedded in speech but on hearing speech uncritically at face value.<sup>4</sup>

Trance force refers to the more esoteric phenomenon that may propel a person or group to engage in trance behavior (Wier 1996).

There cannot be a trance without dissociation, though there can be dissociation without an apparent trance. However, the term is commonly used anthropologically to connote cultural practices that invoke dissociation with particular trance affects. For example, particular affective states during the dissociative possessions in Haitian voodoo are recognizable as specific spirits. Among shamans, anthropologist Piers Vitebsky notes that the onset of trance is marked by traits such as “trembling, shuddering, goose-flesh, swooning, falling to the ground, yawning, lethargy, convulsions, foaming at the mouth, protruding eyes, insensitivity to heat, cold and pain, tics, loud breathing, a glassy stare” (Vitebsky 1995). These are also many of the signs of possession trance, the difference being that the trance of the shaman is a highly controlled experience.

Trance states often rely on triggers involving rhythm, especially drumming (Wier 1996; Winkelman 2000). Music has been tied to such interactions with the spirit realm in most of the world, but the drum in particular may have special qualities that stimulates trance. In 1962, psychologist Andrew Neher suggested that drumming harmonizes neural activity in the brain, a study that was cited uncritically by numerous anthropologists (e.g., Johnston 1972; Lyons 1998:67; Prince 1968; Vitebsky 1995; Walker 1972) as proof

positive of the neurophysiological effects of drum rhythms despite numerous methodological (Achterberg 1985; Bickford and Klass 1969) and theoretical problems (Rouget 1985). However, nearly 30 years later a driving effect of drumming was substantiated in an electro-encephalograph (EEG) study (Maxfield 1990; Wright 1991).

A number of triggers stimulate trance states, as reviewed by anthropologist and shamanism expert Michael Winkelman (2000:148-152). These include extensive motor behavior, such as dancing, combined with exertion, and fatigue; auditory driving, such as drumming and other percussion, singing, or chanting; fasting and nutritional restrictions, which induces a hypoglycemic state; sensory deprivation and stimulation; austerities and endogenous opiate releasers, such as burns, extreme cold, pain, injury, and toxicants, all of which stimulate stress hormones and concomitant endorphins; and hallucinogens. There is an array of psychoactive plants used by ritual trance practitioners that have long been of interest to anthropologists and ethnobotanists (cf. Dobkin de Rios 1984; Furst 1976; La Barre 1969; Schultes 1998; Schultes and Hofmann 1979).

Finally, as Wier indicates, trances can involve varying degrees of memory alteration. In multiple personality and other dissociative disorders, the trance state's structural components are "switches of executive control from one identity to another and amnesia" (1996:4). These switches, which are also true of other forms of trance, are syntagmatic with the two dissociative memory states mentioned above—compartmentalization and detachment. *Somnambulistic trance* is the affective state involving compartmentalization—i.e., amnesia—in which the possessing entity takes over executive control, whereas *lucid trance* the experience of detachment, in which people have the sense that they do not have control over their body and a palpable sense

of another entity in their bodies (adapted from Oesterreich 1974[1921]).

Trance states are often conflated with dissociation because they are the affective state of many forms of dissociation. The preceding section outlines the phenomenological characteristics of trance, as well as the triggers known to stimulate such states. Additionally, it noted a theoretical model for distinguishing types on the dissociation continuum, somnambulistic and lucid trance. Glossolalia, as will become clear, involves a lucid trance. Again, it is important to clarify types of dissociation and trance in order to contextualize glossolalia within the paradigm of dissociation and, as will be discussed in later chapters, to begin to distinguish among types of glossolalia. Since not all dissociative states are apparent as trances, there is still a lack of phenomenological information for distinguishing nonaffective dissociative states. The next section will outline the behavioral and neural correlates of dissociation. This is important in understanding how truly basic a system of the human psyche dissociation is and how it can easily be culturally and personally manipulated in such myriad ways.

### *1.3 DEAFFERENTATION*

The word dissociation is also used in the literature to describe the neurological absence of communication between associated brain regions (cf. Damasio 1994). To avoid confusion, neurophenomenologists Eugene d'Aquili and Andrew Newberg (1993) use the term *deafferentation*. Deafferentation is the blocking or detouring of afferent neural signals, or those signals coming into an area—in this case, areas of the brain. It

simply means that neural input into a structure within the nervous system is 'cut off.' This cutting off, which may be partial or total, can be caused by physical interruption such as by a destructive tumor or surgical cutting, or by 'functional' deafferentation. Functional deafferentation can occur through inhibitory fibers from other nervous system structures. Thus, impulses from inhibitory fibers may actually block input into a neural structure. [1993:185]

This deafferentation results in a limited circuit or set of circuits through which signals can pass, and this limitation creates a functional circle or loop. Such neural looping correlates to behavioral looping or a set of repeated behaviors, such as chanting or dancing. Thus, as described in the following section, there are several levels of looping.

### *1.3.1 Primary- and secondary-order trance generating loops.*

As conceived of in the dissociation paradigm, this functional deafferentation results from a looping or repeatedly activated neural circuit, what Wier (1996) terms a *trance generating loop*. These loops are thought sequences that are repeated. The sociocultural elements of such loops are effected by cultural scripts, which are the discursive resources used to make sense of stimuli and responses, to render them cognitively consistent through interpretation and attribution. These trances and other dissociative experiences must then be explained in terms of these same cultural scripts, creating what Seligman and Kirmayer (Seligman and Kirmayer 2008) term a form of “biolooping.” Each neural circuit of this repeated sequence generates awareness (Wier 1996). Simultaneously, the awareness generated by previous bioloops attenuates but is not totally replaced. The sum of this residual awareness, if sufficient loops have occurred, will be experienced apart from the trance generating loop. It is this residual awareness, dissociated from the looping that generated it, which is experienced as an alternative state of consciousness and effects the dissociative state that is seen as a trance. To continue Wier’s systems analogy, it amounts to multiple parallel processing in which there is one dominant pathway and one or more latent pathways. The dominant pathway is the sum of the attenuating residual awareness generated by the looping, while the looping becomes the latent pathway or pathways. Such multiple processing takes place as a regular part of

cognitive processing but is difficult to subjectively detect (Wier 1996:57-60). However, demonstrations of bifocal rivalry, wherein the eyes are presented with mutually exclusive stimuli can illustrate this phenomenon (for instance, by placing a piece of paper between one's eyes, perpendicular to the face, and presenting a different image to each eye close enough that the other eye can't see). Functional magnetic resonance imaging of bifocal rivalry displays rapidly alternating patterns in visual recognition regions in the brain's occipital lobe, indicating competition between dominant and latent pathways (Logothetis 2006). The subjective experience of this is a toggling back and forth between the images. Such dual consciousnesses are in fact a well-established and fundamental aspect of human cognition (cf. Gazzaniga and LeDoux 1978; Joseph 1982; 1988a; 1988b; Levy 1983; Sperry 1966; 1982).

The type of trance generating loop determines the type of trance experience. Light trances result from fewer repetitions, more intense trances from greater numbers of repetitions. This model allows for trances ranging on a scale of milliseconds to those where people may repeat a thought sequence for decades. And thought sequences themselves can be as short as one sound, movement, or thought or be a long series or combination of sounds, movements, and thoughts. Changes in trance states take place through modifications of the elements in the looping sequence, or trances can be interrupted if such modifications decrease the energy in the neural loop. The attenuation rate of awareness of each generated bioloop is also important, as rapidly attenuating awareness will not leave enough residual to build to a level sufficient to produce a trance. This is why hypnotists will promote a persistent awareness—to slow down attenuation rates—while they simultaneously reinforce a bioloop. The speed of looping is also

important, so the number of elements of a sequence becomes important, as a shorter sequence of items in a loop is likely to cycle more quickly. The quicker a bioloop cycles, the less awareness of each loop is likely to attenuate, generating a trance more quickly. For instance, people who conduct rapid repetitive tasks often become dissociated from their work and can take on a hypnogogic appearance. People who feel rushed throughout an otherwise monotonous workday will report the same experience (Wier 1996:60-64).

There are benefits to the dissociated trance plane. Coasting, as it were, on the residual awareness of trance requires less physical energy than the generating loop (were it dominant instead of latent) because of the disabling of some cognitive functions in the trance state. This conservation of energy also enables abstraction and subconscious learning through the parallel multiprocessing. This explains why many people have the experience of epiphany when they are no longer concentrating on a problem. And, as the functions inhibited are “critical thinking, intellectual processes, judgments, accurate recall, [and] decision-making” (Wier 1996:64), it also explains the hypersuggestibility of trance states. While the dissociated state is energetically efficient, a “small but measurable biophysical quantity” of energy is nevertheless required to sustain the trance and an additional amount required to sustain the bioloop. These combined amounts constitute the aforementioned trance force and can be supplemented by external energy or a *secondary-order trance generating loop*. The strength of the trance force determines the appearance of the visible affective state (Wier 1996:65-69).

Secondary-order loops are external inductors. As suggested, trances are normal everyday occurrences, and, in general, not stable. Someone who seems to be staring off into space—i.e., daydreaming—is in a trance that can be easily interrupted. But a trance

can become more stable when there is an external inductor or trigger or secondary-order loop. Secondary-order loops can create and maintain primary order loops through a non-neural looping or repetition. For example, ritual behaviors like the repetitive whirling in Sufism induces trance, as does chanting, singing, drumming, and drug-taking among shamans. A secondary-order loop is often what is required to produce a deep trance, the kind generally implicated in hypnosis and religious ecstasy<sup>5</sup> (Wier 1996:111-119).

This looping of behavior and corollary biolooping makes for an elegant model, but it is important to substantiate this model empirically. The following section outlines this biolooping with respect to deafferentation in association with the behavioral looping of religious behavior.

### *1.3.2 Deafferentation in the brain.*

Raw sensory input goes first to the respective *primary receptive area*. For example, in following the oscillations of the stereotypical hypnotist's swinging pocket watch,<sup>6</sup> visual sensations come into the primary visual cortex of each hemisphere of the occipital region of the brain, corresponding to Brodmann's area 17. Next, the *secondary receptive areas*—for vision, Brodmann's areas 18 and 19, just anterior to area 17—process the data for recognition and meaning. *Tertiary receptive areas*, also termed *association areas*, may process information next. It is in these areas that multi-sensory and remembered information is integrated. This activity and the focused attention that generates the biolooping are moderated by the executive functions of the prefrontal cortex (PFC). The PFC is a suite of motor tertiary areas that exerts strong influence on the sensory tertiary areas and limbic functions (d'Aquili and Newberg 1993; Fuster 1989; Joseph 1990).

In addition to the PFC, there are three other specific tertiary association areas that

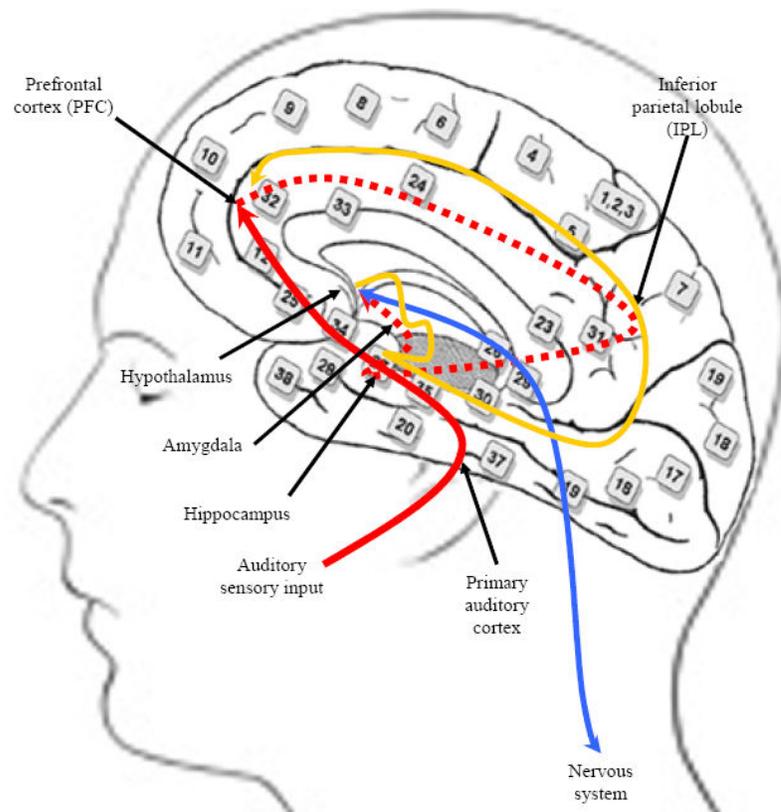
have direct relationships to the limbic system, which regulates emotional responses, and are also closely tied to the parasympathetic nervous system, which generates fight-or-flight stress response. These are the inferior temporal lobe (ITL), the inferior parietal lobule (IPL), and the posterior superior parietal lobule (PSPL). The ITL interacts with the visual system and IPL to scan the environment for objects of interest or importance. The IPL is a circuit box of sorts, as it is at an intersection of association areas and operates there as “an association area of association areas, and maintains rich interconnections with the visual, auditory, and somaesthetic association areas. This area is responsible for the generation of abstract concepts and relating them to words” (d'Aquili and Newberg 1993:182). The PSPL is responsible for analyzing and integrating “higher-order visual, auditory, and somaesthetic information...to create a three-dimensional image of the body in space” (d'Aquili and Newberg 1993:181).

Another important circuit box is the hypothalamus because of its hormonal influence on the peripheral parasympathetic and sympathetic nervous systems. The medial hypothalamic structures and parasympathetic nervous system control *trophotropic* or energy-conserving systems to maintain homeostasis, whereas the lateral hypothalamic and sympathetic system comprise the *ergotropic* or energy-expending system, which is responsible for effecting fight-or-flight. The PFC is the only association cortex that receives neural input from all sensory systems (d'Aquili and Newberg 1993).

D'Aquili and Newberg propose that mystical trance occurs when the IPL deafferentates from the PSPL. In active meditative states, the PFC focuses on a word or image to generate a loop and in passive states purges the mind of thoughts. It partially deafferentates information from the ITL and to the IPL, preventing unrelated associations

and limbic responses, and from the PSPL, disrupting the sense of self in space. All of these areas, including the PFC, communicate with the hypothalamus, which signals vascular dilation and musculoskeletal relaxation in the body. This feeds back to the PFC. The biolooping of this circuit spills over systemically, producing a feeling of quiescence throughout the body (1993).

*Figure 2.4 Deafferentation model of self-deceit (denial)*



Sensory information (auditory in this example) enters as depicted by the solid red line, passing from the primary auditory cortex to the executive associational tertiary areas of the PFC. This information is partially deafferentated from the inferior parietal lobule by the PFC as depicted by the dashed red line. This essentially filtered sensory information continues to the hippocampus, amygdala, and hypothalamus. From there the bioloop returns through the same areas, integrating filtered sensory information with emotions and memories as depicted by the solid yellow line. A secondary bioloop, depicted by the solid blue line, stimulates motor behavior in the nervous system. Adapted from d'Aquili and Newberg (1993) figures 3 and 4.

It is probable that all forms of dissociation are based on similar deafferentation mechanisms, which vary relative to the type of dissociation and information being

dissociated. In denial, for instance, a primary and generally advantageous form of dissociation, the executive function of the PFC maintains a dominant pathway focusing on other thoughts or stimuli and away from unpleasant knowledge, memories, or stimuli. Figure 2.4 is an adaptation of d'Aquili and Newberg's model of passive meditation (1993:186-191) with regard to denial. It begins with incoming information that is personally dissonant. A hypothetical example might be a womanizing male making a verbal sexual advance on a female is told by the female that he repels her. Though he has heard this perhaps many times before, his PFC deafferentates from the IPL areas that would process this fact and its implications and directs it instead to the regions recalling that he has had sexual successes in the past with his approach. These pathways between the IPL and amygdala/hippocampus may determine that it is the female in fact who is offensive. This information is directed to the hypothalamus, which generates an emotional reaction to this association that reinforces and sustains such a loop. In this example the ITL has been left out because it is not visual information.

Dissociation is a psychological concept that has neural corollaries termed deafferentation. When these states are apparent, it is termed trance. Dissociative trance can be both somnambulant or lucid and occurs through quite simple processes of repeating behaviors. These behaviors can be few or multiple and create very short or exceedingly long trances. This variation possible results in an array of disparate experiences within and across cultures. It is important to restate that, as a basic function of psyche, dissociation is a very normal experience. Yet at times the manifestations of dissociation appear extremely abnormal, so it must be reiterated that these manifestations are all part of a dissociation spectrum. To convey a sense of this variety, the following

section reviews a few of the major types of dissociation studies by anthropology and psychology. Anthropologists have long been interested in shamanic soul journeys and possession trance, and the recent increased rate of dissociative disorders in the United States and Europe has drawn psychological attention to them. The following review will focus on what distinguishes these types of dissociation, as well as on the functional basis that unites them. This will be important when later linking glossolalia as yet another major type of dissociation, which is neither shamanistic nor does it involve possession to the same extent as the cults reviewed in the following section. It is a characteristic of a mainstream global form of Christianity, yet its primary dissociative feature has a long and integral role in human cultural history.

## *2. DISSOCIATION AS A CROSS-CULTURAL PHENOMENON*

ASC are universal, and many culturo-religious practices feature dissociation as a primary or key aspect. ASC “exist in a religious context in 90% of a sample of 488 societies,” a 1963 study showed, which included “all parts of the world and traditional societies at various levels of technological complexity” (Bourguignon 1979:245; Bourguignon and Evascu 1977). This near universality of dissociative states suggests an underlying biological purpose that gets culturally manipulated. Anthropologists believe self-induced stress is used cross-culturally as a form of healing. “In rituals and with medicinal plants, people push past normal limits in order to experience power, energy, and transformation” (McElroy and Townsend 2004:274). They do so through exposure to excessive stimulation, such as the hyperkinetics of prolonged dancing and music, drug use, or through extremely low levels of stimulation, such as chanting, silent meditation, or the localized pain of acupuncture. Such self-induced stress is thought to release endorphins,

which are biochemically similar to opium or morphine and known to reduce pain and relieve depression (McElroy and Townsend 2004). These rituals and stress-induction methods are part and parcel of cross-cultural shamanic and possession practices and, from the section above, also recognizable as secondary-order trance generating loops. Clinical psychiatrist Colin Ross, who has written and lectured extensively on dissociation and trauma, believes the psychobiological basis of DID, also induced by stress (though not self-induced), is the same as “trance and possession states found in most cultures throughout history” (1996:4).

Though they are universal, dissociation takes place in different settings. There appear to be three main contexts for the occurrence of dissociation throughout the world: (1) as a response to acute stress or trauma, (2) in socially-sanctioned ritual practices as part of religious systems and in creative settings, and (3) as spontaneous alternations of ordinary consciousness that are unremarkable unless they contrast with cultural meaning systems (Kirmayer and Santhanam 2001). A variety of cultural rituals and behaviors are characterized by the dissociation etic within these contexts (Figure 2.3). Foremost among them are shamanic trances, often soul journeys, and ceremonial possession trance. On the continuum of dissociation (Figure 2.2), these are among the more extreme forms but are non-pathological due to very structured cultural mediation. Dissociation is also increasingly viewed in the context of disorders. Though it is rare, DID receives a preponderance of attention because its striking symptoms, which are outside of a structured cultural system, and association with extreme trauma. These forms of dissociation will be reviewed in the following sections, after which glossolalia will be introduced as a form of dissociation.

## 2.1 SHAMANIC SOUL JOURNEYS

Shamanic spirit journeys are an important form of culturally mediated dissociation because shamanism is often considered the original religion and theoretically the earliest example of cultural mediated of dissociation (Bourguignon and Evascu 1977; Clottes and Lewis-Williams 1998; McClenon 2002; Winkelman 2000). Such a long cultural history alone is suggestive of the importance of dissociation.

*Shamanism* is a generic term used to describe a mode of religio-cultural behavior that invokes dissociative ASC for soul flight among foraging societies (Winkelman 2000). The term “shaman” originally applied to the Tungus people of Siberia and derives from the Tungusic word *saman*, though some have proposed a Chinese origin from *shamen* (“witch”), a Sanskrit origin from *sramana* (“Buddhist monk”), or a Turkish origin from *kam*; but a cross-cultural similarity to the behavior ascribed to the Tungus has resulted in a generalization of their term (Eliade 1964:495-499). Richard Noll, a clinical psychologist who interviewed the last living Tungus shamans in the 1990s, defines shamanism as “an ecstatic healing tradition which at its core is concerned with the techniques for inducing, maintaining, and interpreting the vivid experiences of enhanced mental imagery that occur in the deliberately induced altered states of consciousness in the shaman” (1987:49).

The distribution of shamanic culture as far flung as the Tungus in Siberia, the Bushmen of Southwest Africa, and the Warao of Amazonian South America suggests that such practices are not the result of diffusion but are more likely due to convergent cultural evolution. Winkelman (1986a; 1986b; 1990; 2000; 2002) and others (Bourguignon 1973; 1976; 1979; Goodman 1988; McClenon 1997; 2002; Walker 1972) suggest a predisposition toward altered states (neither just human nor exclusively

mammalian [Siegel 1989a]) influence cultural coalescence into similar religio-cultural forms when socioeconomic organization is also similar, explaining why all these distant foraging cultures practice shamanism and dissociative soul journeying.

Evidence from antiquity also supports theories that it is a religious mode as old as humanity. Cognitive archaeologists David Lewis-Williams and Thomas Dowson (1988) have drawn compelling parallels between the rock art of the Upper Paleolithic and that of the sub-Saharan Bushmen and Shoshonean Coso of the California basin. Ethnographers have found that the Bushman and Shoshone rock art depicts entopic phenomena perceived during shamanic trance states (Campbell 1986; Huffman 1983; Lewis-Williams 1980; 1981; 1982; 1985a; 1985b; 1987; 1986; Maggs and Sealy 1983; Manhire, Parkington, Mazel, and Maggs 1986; Parkington, Yates, Manhire, and Halkett 1986; Whitley 1998; Yates, Golson, and Hall 1985). Entopic phenomena are “visual sensations derived from the structure of the optic system anywhere from the eyeball to the cortex...[and] covers two classes of geometric percept that appear to derive from different parts of the visual system—phosphenes and form constants” (Lewis-Williams 1988:202). *Phosphenes* are produced by physical pressure or manipulation of the eyeball (Walker 1988), which are perceived as visual sensations because all sensory neurons of the eye are sent to the brain’s visual cortex. *Form constants* are artifacts of the visual system beyond the eye and likely result from the brain’s neurology dedicated to form recognition (Bressloff, Cowan, Golubitsky, Thomas, and Wiener 2002; Siegel 1977). Lewis-Williams and Dowson posit that the similarity of art from Upper Paleolithic sites from Europe to Australia (ca. 25-40 kya) suggest it also represents entopic images. The universality of shamanic practices in contemporary societies and recent history supports

the proposition that entopic depictions in Upper Paleolithic rock art are the result of the same cultural practices and consequent experiences in antiquity.

Since soul journeys occur in a global distribution of cultures eticly considered shamanic, it is important to distinguish what constitutes a ‘soul journey’ and why they are an important form of dissociation. The following section reviews the phenomenology or reported experiences, sensations, and appearances of shamanic soul journeys.

### *2.1.1 Phenomenology of shamanism.*

“The main defining characteristics of a shaman,” according to anthropologist Michael Harner (1987:3), “is that he or she is someone who enters an altered state of consciousness (which I have called the *shamanic state of consciousness*, or SSC).”

SSCs<sup>7</sup> are phenomenologically unique and specific among ASC, distinct for instance from rapid-eye movement, drug-states, or meditative state. SSCs are

usually induced by monotonous drumming or other percussion sound, in order to make journeys for a variety of purposes in what are technically called the Lower and Upper Worlds. These other worlds accessible to the shaman in the SSC are regarded as an alternate reality, and the shaman’s purpose in journeying to it in the SSC is to interact consciously with certain guardian powers or spirits there, which are usually perceived as power animals. The shaman solicits the friendship and aid of such power animals in order to help other people in various ways, and he or she may also have spiritual teachers in this hidden reality who give advice, instruction, and other forms of assistance. [Harner 1990:xix]

Shamans view spirit journeying as a controlled form of dreaming, as another instance of the “personality soul” taking flight. The purposes of such voyages may involve the kidnapping of the souls of laypersons or enemy shamans or traveling to other realms. The shaman’s body remains relatively unconscious. These realms represent a parallel yet completely tangible dimension only accessible to certain people and only with special skills and training. The elemental power of shamans is manifest in their

ability to manipulate the boundary of these dimensions, possible due to their close proximity (Vitebsky 1995).

Rituals of death and rebirth are often enacted each time shamans perform, albeit on a smaller scale. It becomes easier for them to achieve the trance state. They must be able to retain a certain level of consciousness in order to orchestrate the drama for their respective community, which repeated performances along with the lessons of initiation have taught them. The trance is primarily one of lucid dissociation but is marked by “levels” of amnesia regarding the “real world,” and proficient shamans learn to keep one metaphorical eye open. They therefore have knowledge of both the spiritual realm and the ceremony going on around them, often while remaining motionless and isolated or in a state of rhythmic chanting. Other times shamans’ behavior is extremely dynamic, and the community and shamans have altogether different experiences. Shamans’ faces becomes transformed, and their movements are altogether not in keeping with the everyday people to whom the bodies belong (Goodman 1988:12).

This death and rebirth phenomenon and many of the psychic illnesses and crises that are typically initiatory for shamans have led skeptics to compare them to schizophrenics, hysterics, and psychotics. Indeed, schizophrenia appears to be in some way related as perhaps an extreme and irremediable form of deafferentation and biolooping, but it also lacks cultural structure. It is important to briefly discuss the mental health of shamans, as Pentecostalism and other dissociative religious practices have been called retreats or cultural hideouts for the mentally ill. Upon closer examination, however, the opposite appears to be the truth.

### 2.1.3 *Mental health of shamans.*

It has been suggested that shamanism is a cultural niche exploited by the mentally disturbed (cf. Czaplicka 2001; Devereux 1956; Devereux 1961; Hultkrantz 1978; Jeste, del Carmen, Lohr, and Wyatt 1985; Lot-Falck 1977; Perrin 1992; Polimeni and Reiss 2002; Polimeni and Reiss 2003; 2005; Silverman 1967; Stevens and Price 2000). Indeed, as Eliade (1964:24) points out, Siberian shamans have been considered the quintessential shamanic psychopaths as evidenced by their episodes of arctic hysteria (often the initiatory illness) and sub-Siberian shamanism as distinguished by degrees of neuropathy (Ohlmarks 1939). These assessments are inherently biased, defining mental health in antiquated Western ethnomedical terms. Culturally-mediated dissociation is now acknowledged in the current Western ethnomedical system, as reflected by the *DSM-IV-TR* (APA 2000). The same behavior outside of ritualized or culturally-appropriate contexts would earn these same practitioners diagnoses of dissociative trance disorder, a subcategory of DDNOS, the miscellaneous diagnosis for maladaptive dissociation.

Eliade (1964:24-26) reviews a number of scholars who have analyzed shamanism in terms of or as deriving from neuropathy, but it was anthropologists like the eminent Alfred Kroeber (1940), whose modeling of shamanic behavior as mental disturbance, fixed such perceptions well into the 21<sup>st</sup> century. This was echoed by psychoanalytical anthropologist George Devereux (1956; 1961) and further validated by anthropologist Weston La Barre (1970; 1972). This characterization continues to date, though recast in terms of genetic group selection. Schizophrenia and obsessive-compulsive disorders are hypothesized to be byproducts of traits bundled with shamanic cultures (Jeste, del Carmen, Lohr, and Wyatt 1985; Polimeni and Reiss 2002; Polimeni and Reiss 2003; 2005; Stevens and Price 2000).

The shamanic neuropathy model has been repeatedly refuted. Shamans in fact are probably the more mentally balanced people in their communities. Eliade states that

the mentally ill patient proves to be an unsuccessful mystic or, better, the caricature of a mystic. His experience is without religious content, even if it appears to resemble a religious experience, just as an act of autoeroticism arrives at the same physiological result as a sexual act properly speaking (seminal emission), yet at the same time is but a caricature of the latter because it is without the concrete presence of the partner. Then too, it is quite possible that the assimilation of a neurotic subject to an individual possessed by spirits—an assimilation supposed to be quite frequent in the archaic world—is in many cases only the result of imperfect observations on the part of the earliest ethnologists. [Eliade 1964:26-27]

Noll contends that shamans are chosen for their resiliency and perceptivity, not mental disturbance. Whereas the mentally ill become lost in a destabilizing private experience, shamans are more focused by their “voyage,” experiencing it as a trip into an alternate universe where they are taught to have a more acute sense of control of their own and their community’s relationship with the spirit realm (Noll 1983; 1987). Boyer et al (1969; 1973) have found Mescalero Apache shamans to be mentally sound. Handelman (1967) found the same to be true of Washo shaman Henry Rupert. St. Lawrence Eskimo shamans have been found mentally health (Murphy 1964), as have those among the Nepalese (Peters 2004).

The depiction of shamanic behaviors in terms of Western pathology evokes a medical model that obscures understanding the specifics of SSC and dissociation in general. Pathologies such as schizophrenia are organic personality traits and functionally pervasive. In contrast, SSCs are states of mind, transitory, and specifically and purposively induced and mediated through acceptable cultural practices (Noll 1983). The long cultural history of dissociation through shamanic spirit journeys attests to its normalcy and importance. The same criticisms have been made of possession trance,

which is in many ways similarly exotic to most Westerners and long studied by anthropologists. But it is important to review a few major possession trance cultures, as the socioeconomic structure of society appears to exert substantial influence on cultural manifestations of dissociation. Thus, reviewing these different forms and their associated socioeconomic structures helps clarify why religious dissociation may appear as glossolalia in industrialized countries, not as soul journeys or possession trance.

## 2.2 POSSESSION TRANCE

The other main type of ritualistic trance state is known as *possession*, wherein the souls of people are typically displaced by a specific spirit. Possession has perhaps a cultural history second only to shamanic spirit journeys. It also deserves attention because it appears in more developed social contexts and provides a natural bridge to discussing glossolalia, which is a form of possession that prevails in industrial society.

There are two types of possession, only one of which utilizes dissociation. Plain possession is simply the belief in the capacity for a person to be changed by the presence or invasion of spirits or powers. They may use this belief as an explanation for alterations in behavior, illnesses, diseases, and even social grudges, in much the same ways that accusations of witchcraft have been attributed to the inexplicable and misunderstood (Evans-Pritchard 1937). *Possession trance* (PT), on the other hand, is present “when...there is such a belief in possession and...it is used to account for alterations or discontinuity in consciousness, awareness, personality, or other aspects of psychological functioning” (Bourguignon 1976:8). Possession is strictly a psychological alteration; PT includes a physical one (Bourguignon 1976:7-8). It is PT that is specifically of interest here and will be referred to hereafter.

Like shamanism, PT cults have been labeled as refuges for the mentally ill (Ward 1980). While they may provide something to which such people may cling, they are refuges for all. That is their primary function. There are mentally disturbed people everywhere—in PT cults but also in Christian congregations, Jewish temples, Islamic mosques, and secular settings. Ritualized PT in such cults, as with all religions, provides structure for entire lives, including some (but not all) individual pathology. PT cults may thus contain “abnormal” behavior, metaphorically speaking, rather than allow it to flounder recklessly. In such cases, it is often because the given society is without sufficient governmental institutions to accommodate such individual discomfiture. However, it is often the case that the mentally disturbed are impaired in fundamentally social ways and cannot abide the structure of PT cults. Their pathologies manifest idiosyncratically, though other cultural PT modes, like demoniac possession, may exist for such individuals (Walker 1972:2).

The following sections will discuss a few extremes of PT. This is important to illustrate the range of culturally relative dissociation practices and variations in their social acceptability. Like many of these forms, glossolalia varies in its social acceptability. It is similar to demoniac possession in appearing in industrialized countries and deriving from a Judeo-Christian belief system, but demoniac possession more closely resembles DID in that it is personally idiosyncratic and lacks social structure and validation. The PT of *vodou*, *zār*, and Pentecostalism are all central to religious practice, rendering them what ‘central possession cultures’ (Lewis 1989:29). Because non-demoniacal PT forms share many attributes distinct from demoniacal, the abbreviation PT will refer to non-demoniacal forms except in sections specifically discussing

demoniacal PT; demoniacal PT will be referred to as demoniacal possession.

### *2.2.1 Possession trance cultures.*

There are essentially three ways to differentiate societies engaged in possession behavior:

(1) those in which trance is desired, voluntary, and intentionally invoked, such as Haitian vodou or Cuban *santería*; (2) those where initial trance is deemed deviant or sickness and involuntary but where a ceremonial cure manifests PT in a controlled setting, as with *zār* cults of North Africa and the Middle East; and (3) those in which the trance is involuntary, feared, and every effort is made to drive it out, such as Christian demoniac possession (Bourguignon 1976:9).

#### *2.2.1.1 Vodou*

Vodou (used interchangeably with *vodun*, *vodoun*, *voudou*, *vaudon*, and voodoo) is one of the most documented forms of PT. It is practiced by the Creole population of Haiti and Haitian immigrants in cities like New York. For devotees, it is common to invoke possession of oneself under the guidance of mediums called *houngans* (*oungans*) or *mambos* (*manbos*) (for males and females, respectively) during vodou celebrations, or it may be these specialists who are possessed (Brown 2001:56). As mediums, the predominant magico-religious activities of houngans and mambos are healing and divination, providing protection from spirits and malevolent magic, agricultural magic, and propitiation of the *loa* (ancestral spirits). Mediums are predominantly female, have low socioeconomic status, and are considered moral authorities. They are part-time, collective/group practitioners, selected for their roles through spontaneous possession, then trained by other practitioners. They are recognized in their role through ceremonial activities. Their professional motives are to act at the behest of clients in public

ceremonies by inviting the spirits, over which they then have little to no control.

Possessions are dramatic public instantiations of somnambulistic trance marked by amnesia, spontaneous onsets, tremors, convulsions, seizures, and compulsive motor behavior (Winkelman 2000:68).

Historically, vodou was denied by all but the peasantry (Hurston 1938) and considered “a lower-class folk religion” (Bourguignon 1976:34) that Haitians typically abandoned upon reaching a higher socioeconomic strata, but it has become a target of tourism in recent decades (Richman 2008). Throughout its history, vodou has provided a source of social unity and an organizational point around which to rally revolts against both oppressive colonial, and, ironically, the subsequent governmental powers that spring from such movements (Burton 1997).

The rituals of PT give participants a chance to get respect, something that is generally in short supply in Haitian peasant lives (Burton 1997:221; Métraux 1959:135). In the possession psychodrama, the spirits “ride” the participants, also enabling them to act out in ways within the ceremonial setting that wouldn’t otherwise be acceptable. This is why it is especially a resource of the poor; their status allows them little recourse for political disgruntlement. Such a periodic release of tension is a recognized necessity in many cultures, most of whom provide some form of cathartic recreation through which they encourage the acting out of certain otherwise undesirable urges (Walker 1972:5).

The loas are integrated into the peasants’ lives to the extent that spontaneous possessions often occur early, frequently as an individual’s first one. The circumstances are crucial and generally entail some form of major life change or stress. The deity involved in such possessions is called a *loa bossal*, which means the person’s behavior

was uncontrolled and doesn't conform to any recognized deity. The person is subsequently given ceremonial instruction and taught how to control his possession to invoke specific deities (Walker 1972: 81-82). Most of the possessed, apparently gain nothing more than "the approval of the congregation, ...measured by the amount of attention it devotes to his words and actions" (Métraux 1958:135)—which is to say the "horse" (as the possessed are termed, which are "mounted" by the loa) gains reputation and respect, a precious reward for any black West Indian, but especially for a black West Indian woman (Burton 1997).

Similar practices exist on nearby islands and Central and South America but vary depending on the combination of African and other immigrant labor, such as East Indian Hindus and Chinese Buddhists, as well as the colonizing country and the structural integrity of the current society. Among the creole of Cuba, there are possession rituals within the context of *santería* (Brandon 1997); *gagá* is a form of vodou that was adapted to the Dominican Republic by infusing vestiges of the island's native *Taino* traditions (Brown 1999:74; Olmos and Paravisini-Gebert 1997:5-7); among the Brazilians there is *candomblé* (Wafer 1991), *umbanda* (Brown 1994), and, though not a possession cult to the same degree but still involving PT with some roots in African traditions, spiritism (Hess 1994). While both *candomblé* and *umbanda* are Afro-Brazilian practices, the former is considered more African (Wafer 1991). In *umbanda*, PT is often the realm of the second generation of African and European syncretization, an upwardly mobile middle-class in the flux of social change (Goodman 1988:45). In Trinidad the *shango* cult is derived from the Yoruban worship of the god Shango filtered through the prism of immigration from other Caribbean islands, Britain, and France over the past few centuries

(Burton 1997; Simpson 1962).

As with other forms of culturally mediated dissociative trance, the marks of a possessed person as they are popularly known include being “dazed, stiff, possibly going into convulsions” (Goodman 1988:13). Participants have often been fasting and feel the onset of hypoglycemia, or have used alcohol, or induced hyperventilation, all of which are known to slow brain waves slightly (Walker 1972:15). Devotees may fall to the ground and roll before the drums or stagger blindly about (Goodman 1988). There may follow a period of hyperactivity accompanied by fine tremors and convulsive jerks. The deity is then said to have taken over, and the possessed person acts accordingly; facial expressions, manner of speaking, moving and things said appear dramatically inconsistent with the usual behavior of the individuals. A totally new personality with full depth, breadth, and resilience emerges. There can be as many of these personalities as there are gods who possess the individual (Ravenscroft 1965:167-168). These characteristics will be familiar to most participants of the possession ritual, and it is important that such recognition be made, as each deity requires its own particular drum rhythms and songs. Return from possession is marked by exhaustion and a mild state of euphoria (Goodman 1988; Walker 1972).

Possession is led by hougans or mambos, who ‘communicate’ or trigger it in suggestible or sympathetic participants. Such leaders remain in lucid trance states, like shamans, so that they can control the proceedings and draw on their intuitive talents and knowledge to diagnose and treat (Kiev 1961:134). With age, they come to regard themselves as controlling their deities rather than being controlled by them. This is consistent with the inverse situation in which early possessions, whether ceremonial or

not, are typically more dramatic or violent. This gives the impression that the first one occurs due to buildup of tension and later ones to more controlled release (Walker 1972).

Haitians are socialized to the deities throughout their entire lives. Children attend family ceremonies from the time they are born and “hear stories about spirits as they hear anecdotes about people in their families and neighborhoods. They see dancing and hear songs and music associated with the spirits, so that by the time they experience an altered state they have learned the basic information relevant for appropriate behavior” (Bourguignon 1976:17). Possession ceremonies are highly structured and purposeful. Nevertheless, vodou is an open system in that “neither the number nor the character of the spirits is fixed, so that much innovation in ritual and personal expression is possible” (Bourguignon 1976:18).

Individuals in PT cultures often resort to possession as a means to cope with stress, though it generally occurs in ceremonial situations. The invocation of a loa gives such a person confidence and authority that he or she does not ordinarily possess.

Such non-ceremonial possession occurs in specific kinds of social and psychological circumstances usually involving extreme personal stress, fear, pain, or fatigue, or when the honor, interest, or life of the subject is threatened. These situations are usually such that they require independence, assertiveness, dominance, or responsibility beyond the capacity of most Haitian peasants...In the possessed state the individual has an incredible range of physical capacity and endurance relative to his unpossessed performance. [Walker 1972:43]

Provided the others present are of the same culture and share the same values, the person possessed feels no fear, and the personality of the god elevates him or her to a superior position (Walker 1972:44).

There are social precedents and logical explanations for such coping mechanisms. In Haiti the first possession usually comes with the responsibilities of adulthood. They

decline as the aged become dependent on their children (Bourguignon 1976:39; Ravenscroft 1965:174). The presence of the spirit is taken as a positive sign that elevates the person's esteem in the society (Walker 1972:44), but a person who continues to be spontaneously possessed, whose possessions are not complete, continually begin and end with difficulty, or occur in awkward moments—who is ultimately incapable of controlling them—is considered unworthy of the loa. This may be interpreted as a warning to improve behavior, or the person might be considered “deranged” and in need of treatment by a vodou specialist, as “something is wrong in the relation between human and spirit.” Widespread occurrence might even indicate an overall lack of social cohesion, as more rigidly-structured ceremonial communities have few incidents of spontaneous, uncontrolled possession (Bourguignon 1976:17).

Loa do not hand out prescriptions for life; rather, they work through a problem, and decisions are based on interpreting the words and actions of all the spirits combined.

Describing Mama Lola's experiences, Brown says,

All significant events are filtered through the sieve of their personalities, and their character traits and patterns of behavior frame her choices. But the spirits are not moral exemplars. Nor do they dictate exactly what she is to do, although from time to time some of the spirits give advice. More commonly, through possession-performance, the spirits explore all the potentialities, constructive and destructive, in a given life situation. [2001:112]

Vodou spirits are not ideals but representative slices of reality. Dealing with the loa is “dynamic state of being that demands ongoing attention and care. Virtue is achieved by maintaining responsible relationships” (Brown 2001:6-7).

The ability to slip into PT is widespread among Haitians but seems located in certain types of people more than others. Heritability and suggestibility of the person is important in accruing the benefits of PT, as are attitude, nutrition, physical and

psychological trauma, lifestyle, cultural perception—whether it is seen as a positive or negative value—and other dimensions of habitus (Walker 1972:24; Wittkower 1964:79). If stress is an environmental trigger, then any poor Haitian is susceptible. In Haitian culture and vodou, life entails complete submission to one's superiors and to the will of the gods. The same emphasis on submissiveness is characteristic of the child-rearing process in which children are forced to obey and curb their feelings of aggression toward their elders by corporal punishment and threats of harm from the werewolves and other evil spirits. Devotees must surrender their ego to be accessible to the deity, especially in times of personal crisis, as it is specifically in such instances that they do not have other psychological mechanisms to cope (Walker 1972:68).

Like mediums, as vodou participants become more familiar with PT, invocation of deities comes relatively easier. This can also be true in cases of non-ceremonial possession when it comes on discretely and without the convulsive induction period under circumstances that would appear awkward (Walker 1972:44). Such a trance is seldom deep in the absence of the ritual environment (Ravenscroft 1965:178-180).

Vodou began as a resource of predominantly the poor, though it has become more pervasive. Individuals are socialized to manifest traditional loa but may also display individual variations and new themes to deal with new or unique personal or cultural circumstances. These possessions resemble other cross-cultural forms of dissociative trance and seem to be utilized at some level to deal with stress. The degree to which people experience somnambulistic or lucid PT varies from society to society. It is posited that if there was a sharper degree of contrast between devotee personalities and that of possessing deities, there would be no need for such justifications as amnesia and

convenient forgetfulness. In Haiti, the possessed person recalls nothing of the possession and acts as if all actions involved were those of an unrelated person, while in Brazilian *candomblé* people can become surprised and upset by their behavior while possessed. Members of the *zār* cults, however, profess no memory of their possessions but sometimes act otherwise, which has been attributed both to ruse and post-hypnotic suggestion (Leiris 1958:77; Walker 1972:49).

### 2.2.1.2 *Zār*

Among the Arabic-speaking Muslims of Northern Sudan, *zār* spirit possession is an illness than can be ameliorated but never cured (Boddy 1989:8). *Zār* refers to the type of spirits, the rituals and activities devoted to them, and the ways or patterns of conducting those rituals and activities (Kenyon 1999). The origins of the *zār* cult are obscure but believed to have spread via trading caravans (Cloudsley 1983), while the word likely derives from Amharic, the official language of Ethiopia. The cults were well-established by the mid—19<sup>th</sup> century and were so widespread by the time of Anglo-Egyptian conquest that they were denounced as a threat to orthodox Islam. Yet they are tolerated and even legitimated within Islam, the *zār* spirits or *zayran* belong to the *jinn* (whence the word “genie” is derived) class of spirits, which are substantiated by the Quran. *Zār* cults have been observed in many Arabic areas of Africa and the Middle East, including Algeria, Djibouti, Tunisia, Morocco, Saudi Arabia, Kuwait, Qatar, United Arab Emirates, Iran, West Africa, Egypt, and Somalia (where it is called *sar*) (Lewis 1989). Though beliefs are different, *zār* is also practiced in Christian Ethiopia, and similar cults throughout that region with historical relationships to *zār* cultures emphasize relieving illness or distress by placating invasive spirits. There are the *shatana* practices of

Ethiopia; the *liban sheitan* of Chad; the *shaitani* of the Digo of south Kenya; *shetani* of the Segeju Swahili of Tanzania; *masabe* of the Tonga of Zambia; the *bori* of Nigeria and North Africa; *trumba* (*tromba*) and *patros* in Mayotte, Comoro Islands, and Madagascar; *saka* or *pepo* of the Wataita of Kenya; the *takuka* of the Ndembu of Zambia; the *holey* of the Songhay; and the *jnun* of the Hamadsha of Morocco (Boddy 1989:131-132).

Although a *zār* spirit inflicts suffering on a host, it also shows positive concern for that person (Boddy 1989:133). It is like a symbiotic relationship that is portrayed as parasitic (the spirit preying on the host) but is more accurately mutualistic (both benefiting the other) or commensal (the host benefiting from the spirit while the spirit is neither helped nor harmed). Such relationships can be maintained indefinitely as long as the survival of either is not jeopardized and, indeed, *zayran* spirits rarely abandon their hosts. Hosts have no control over spirits and can be inhabited anytime, though *zār* PT seldom occurs outside of ritual contexts.

Whereas in Haiti and other cultures where the possession is sought out, in the *zār* cult the emic of trance is that it occurs because the person is already possessed (Boddy 1989:134; Lambek 1980:7). Entering trance is a process learned through curing ceremonies designed to help victims negotiate relationships with intruding spirits. One learns “how not to resist a spirit’s attempts to enter the human world through the medium of her body” (Boddy 1989:134). In this way, PT is culturally mediated and has specific times when it is appropriate and others when it is inappropriate. For instance, menstruating women are sexually taboo and not to be entered by spirit (or husband), as signaled during ceremonies by a knot tied in her braids.

Trance is not always present during curing ceremonies and varies in intensity and

duration from occasion to occasion and among individuals. But curing ceremonies are part of the negotiation humans make with spirits, and spirits not given this due may become dangerous by entering their hosts at will and causing trouble (Boddy 1989). In addition to these spaces to operate among humans, they demand hosts attend the ceremonies of other spirits, abstain from traditional mourning behavior, associate with clean and sweet-smelling things, and not indulge in strong emotions. Attempts to cure in any way beyond the mediated ceremonies, including Islamic or biomedical forms, only bring further suffering. Yet, as with other types of possession relationships, the moral overtones of spiritual demands, while constraining upon the host, may reduce the risk factors that undermine health (Boddy 2001:405).

As with vodou there is a distinctive cultural affect despite the less welcome nature of the *zār*. Among the Sudanese Hofriyat, these women, who in their day-to-day lives strive to maintain a restrained decorum, dance wildly when possessed and take on “bizarre mannerisms.”

Smoking, wanton dancing, flailing about, burping and hiccupping, drinking blood and alcohol, wearing male clothing, publicly threatening men with swords, speaking loudly, lacking due regard for etiquette, these are hardly the behaviors of Hofriyati women for whom dignity and propriety are leading concerns. But in the context of a *zār* they are common and expected. [Boddy 1989:131]

*Zār* possessions are a surprise for those attending ceremonies, even though spirit presences are expected. It is common that called spirits fail to arrive and women who did not realize they were possessed become seized by a spirit. Other spirits may refuse to leave when the drumming stops. Even those women whose presence at a ceremony is required by their spirit and who are accustomed to PT approach ceremonies with trepidation because spirits are powerful and often frightening. Ceremonies are, however,

on the whole, considered pleasurable events (Boddy 1989:349).

Zār ceremonies are highly structured and a number of trance inductors typical of PT cross-culturally are utilized. These may include persistent rhythmic drumming to focus attention; hyperventilation, including hyperventilated tobacco smoke inhalation; consuming alcohol; and “inducing dizziness by quick up and down movements of the head and torso from a kneeling position, called *nizūl*, ‘descent’” (Boddy 1989:349). This structure extends to non-ceremonial settings as well, and individuals may early on cultivate alternative perceptions of themselves, reinforcing the distinctiveness of possessing spirits from their own personalities. This brings them further attention through their spirits, as prophecy and prognostication are greatly valued in the culture. PT is thus welcomed by many, provided it is conducted in a controlled and orderly fashion (Boddy 1989:349).

The zār spirits are considered amoral. They are known to love beauty and human finery and so, as hosts become versed in PT, often provide them pleasurable experiences while possessed. However, they demand more than hosts can provide, as they are not respectful of the costs of such finery, the time beautification regimens require, or the ravages inflicted by necessary physical labor. This makes zār much like their human hosts, as they are neither good nor bad but ambiguous and ambivalent. They are exaggerations of human fecklessness and frivolity, unchecked by the practical constraints of village life (Boddy 1989:272-273).

Similar to loa, zayran are familiar to their human hosts, and their personalities derive from their position in the parallel spirit universe, a universe that mirrors ethnic distinctions. For instance, among the Hofriyat, *Darāwīsh* spirits are those parallel of

founders of Islamic fraternities represented in Sudan and known to have lived in the 12<sup>th</sup> and 13<sup>th</sup> centuries, and there is a whole dynasty of spirits associated with these fraternities (Boddy 1989:275-280). There are Ethiopian spirits called *Habish*, which parallel Ethiopian Christians and some Arabic-speaking Muslims residing on the Ethiopian frontier. Male *Habish* exemplify political power and legitimate, heritable authority,” whereas female *Habish* are all prostitutes “or at the very least salacious” and obvious by their request for red dresses and headscarves (Boddy 1989:280-281).

Like vodou possession, *zār* ceremonies are structured and purposeful. Children are socialized to manifest culturally relative spirits from birth, and, when treated appropriately, spirits provides much-needed personal and social valves for personal stress and social tension. Yet, the *zār* are considered unwelcome, and ceremonies are appeasements of possessions that have already taken place rather than invocations of them. Hosts attempt to benefit from spirits by placating them rather than seek them out for advice and help.

This relationship places *zār* between vodou and Christian demoniac possession, though *zār* and demoniac possession sometimes get lumped together. One important difference is that *zār* is both culturally structured and validated, whereas demoniac possession, though appearing in Christian, industrialized contexts, is unstructured and unsupported. Demoniacally possessed individuals often find themselves institutions, rather than supportive cultural ceremonies, as the following sections describes.

### 2.2.1.3 Demoniac possession

There are manifestations of PT outside of the ritual context as well that are neither desired as with vodou nor tolerated as with *zār*. Certainly the most familiar to average

Westerners is demoniac possession in the Christian realm, popularized in movies such as *The Exorcist*. Barring charismatic religions, as will be discussed, most Christian religions have no integrated or 'sacred' space permitting the use of possession. Therefore, if as suggested dissociation is the psychological function of stress response (a topic that will be discussed in more detail in chapter 3), it may be manifested anomalously and chaotically under circumstances that cast the sanity of the possessed individual into doubt. The 'ritual' procedures of the West, if they can be called such, often include some form of hospitalization and psychoanalysis, following or accompanied by exorcism. The degree of success varies, attributable perhaps to a certain amount of denial that possession is in fact real and on the lack of consistency of even these default "rituals." They are, in fact, the remedies often pursued in the face of a lack of knowledge as to how to treat the demonically possessed individual.

In these instances, what is emicly interpreted as a vindictive spirit, such as a deceased individual who has for some reason not moved on, a malevolent demon, or the arch rival of Christianity's God, Satan himself, inhabits the bodies of involuntary victims who periodically lose consciousness and act out according to the wills of these beings, usually to the social, mental, and physical detriment of the individual so possessed. Although such occurrences are not as frequent as the entertainment industry could lead one to believe, "they are so spectacular that...there are written records of them going back two thousand years" (Goodman 1988:98). There are even apparent instances in the bible, including the possession of Legion and an exorcism performed by Jesus. A number of other incidents from Europe have been documented over the years but involving significantly less famous personages (Goodman 1988).

In recent history, demoniac possession has become rare. After a peak in the Middle Ages and the advent of germ theory, there was a transition from “diabolical” forms of possession (i.e., witchcraft or demons) to mental illness (e.g., conversion disorder, hysteria, split or multiple personality, schizophrenia) (Ellenberger 1970). Yet, cases of such possession have been reported (though in some may be conflated with dissociative trance disorder and not emicly ascribed to devils or demons but to malevolent or inconvenient spirits) in the West, Hong Kong, south Asia, Central and South America, the Caribbean, and among tribal societies (Bartlett 1989; Casper and Philippus 1975; Colson 1969; Crabtree 1985; Elder 1970; Evans-Pritchard 1937; Ferracuti and Sacco 1996; Freed and Freed 1964; Galvin and Ludwig 1961; Gaviria and Wintrob 1976; Halliburton 2005; Hunt 1998; Janet 1894b; 1926; Kiev 1964; Lewis 1989; Ludwig 1965; Oesterreich 1974; Taylor 1951; Warner 1977; Yap 1960).

Unlike *zār* possession, there is no structure to support, temper, or provide meaning for demoniac possession, which manifests as illness that must be cured or removed. The possession’s initial period of illness elicits the concern of family and doctors because of the failure of conventional remedies; an exorcist may then be called in, whereupon the spirit reveals its presence, and healing is attempted through dislodging or expelling it (Goodman 1988:95). What Goodman refers to more generally as the “Eurasian type” of possession, as opposed *zār*-like PT cults, is distinguished by “a chronic phase of depression and frightening visions, interspersed with individual episodes of violent possession, often described as attacks. These have a clearly marked onset, where the subject visibly slips into a religious trance, and which is characterized by intractable raging” (Goodman 1988:96). The Catholic Church has tests to detect such possession,

which essentially determine if the pre-eminent signs of demon possession are present—if the “demon” has aversions to everything sacred and speaks through the victim’s mouth.

Additionally, other affective signs could include

insomnia; fever; agitation; roaming; compulsively eating strange or repulsive substances, or refusing all food, resulting in an anorexialike condition; repulsive stench; copious foaming saliva; trembling, which may escalate into convulsions; rigidity of muscles up to a catatonialike state; severe abdominal pain; screaming fits; grinding of teeth; uncontrollable weeping; superhuman strength; a near-total change in facial features; a number of different forms of aggression, especially autoaggression up to suicide and aggression against associates; the demons speak with a rasping, low voice completely unlike that of the natural voice of the speaker, often switching into *corprolalia* (uttering strings of insults and obscenities) in combination with copious divinatory or prophetic pronouncements. [Goodman 1988:96]

This *corprolalia*, and demoniac possession in general, is significant in that incidents invariably occur in people who otherwise lead lives of quiet humility, whether actively religious or not. The tendency of demons to break out of such characters, to foreground drama and obscenity by manifesting it in reserved people, has historically been utilized for political and social change. Possession in this sense becomes a mechanism whereby ideas officially disapproved of or taboo can be voiced with impunity. In Christian settings, demoniac pronouncements are antithetical to good unless said under duress, especially the authority of the Virgin Mary, in which case they carry high authority. A dangerous idea, given verbiage by a demon could then surreptitiously enter the arena of debate among the body politic and plant the seed of reform. This was especially true in the stringent times of the Middle Ages. What demons said speaking from the mouth of the possessed quickly made the rounds and carried as much weight as nowadays remarks of a powerful politician at a press conference. Demoniac pronouncements were suitable and versatile weapons in inner-church conflicts, theological controversies, and church politics. As recently as 1976, German university

student Analiese Michel was possessed by a demon that had in mind reforms for the Second Ecumenical Council, which were subsequently approved (Goodman 1988:96-97).

As with the zār cults, demoniac possession often manifests after there is a breaking of a taboo or commission of a crime, which are believed to “open the door to demonic forces” (Goodman 1988:98). The person will begin to feel and see that there are demons and evil about. These demons tempt the person into doing socially and culturally threatening actions, often jeopardizing or trying to extinguish the life of the possessed body. The ritual of exorcism therefore becomes imperative to both save the life of the victim and to protect the society from possible harm caused by the victim’s anti-social behavior. The exorcism “is a social drama on a grand scale, often involving levity” (Goodman 1988:98). There is a gathering of people who are close to the victim, and an exorcist, who functions much like a houngan, calling upon the powers of “good” to assist them. The demon is forced to emerge, to announce its name, and to explain its attack on the victim. Following lengthy prayers, the “illness” is identified in an acceptable forum, and the demon admits defeat, restoring its victim to health upon departure.

The parallels of demoniac with other forms of PT are obvious. The incidence of possession provides a cathartic release for the individual and society. It is characterized by a dynamic role that thrusts the possessed individual into a spotlight that is otherwise unavailable. The subsequent exorcism provides a mechanism for reintegrating the individual into the group after a moment of glory through the expression of community concern and collaboration in restoring the individual, and thereby the society, to health. It is also a means of circumventing restrictive social institutions to provide validation for the individual and a reprieve from the dullness of an otherwise restricted existence as

well as a means to instigate social change. In some situations, demoniac possession has blurred with the contemporary diagnoses of idiosyncratic, pathological dissociative states. DID sufferers may have alternate identities that claim possession by demons or the Devil. This is suggestive of the tension between religion and science introduced in the forward. Both science and religion are treated by some as belief systems, and, though they are philosophically distinct, they can become phenomenologically intertwined. For instance, Pentecostal glossolalists seek the attention of medical doctors and psychologists for physical and mental maladies yet also variously believe in demons and possession. The following sections outline the Euro-American cultural model that is supplanting or being retrofitted alongside possession beliefs in industrializing countries around the world. It is important to review these forms because it supports the assertion that culturally relative dissociative behaviors will manifest wherever there is human stress.

### *2.3 DISSOCIATIVE IDENTITY AND OTHER DISSOCIATIVE DISORDERS*

While dissociative disorders are by definition pathological, they are culturally constructed and fit in this same paradigm. They are important to understand because they can be structurally similar to glossolalia, and, in fact, I have developed a glossolalia typology based on the typology of DID outlined in a subsequent section.

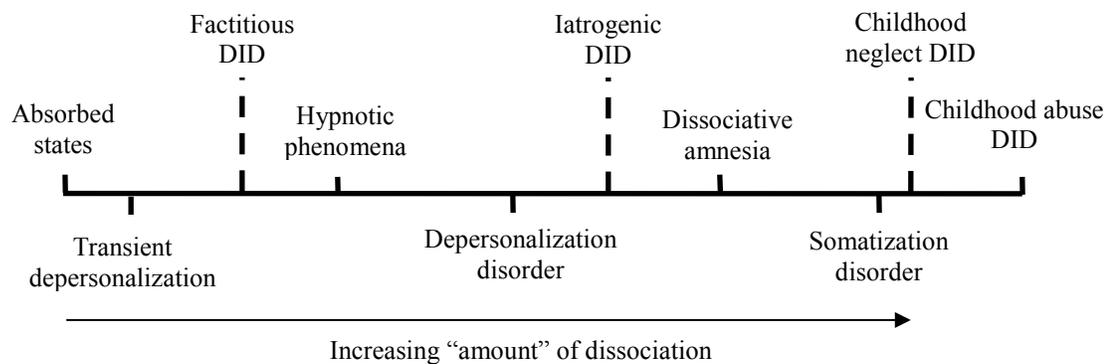
What is perfectly normal in Haiti is outside of most Westerners' perceptual frame of reference, and it can even take on a sinister quality to such wary uninitiated. Even in medical circles DID is controversial. There are those that argue it is manufactured by therapists or, at very least, was inadvertently suggested into historical existence by a few eminent psychotherapists who established the model that has been copied ever since. In the wake of 1957's Academy Award-winning *The Three Faces of Eve*, DID has become

the *deus ex machina* of American cinema. Where the Greeks rescued an irresolvable plot through the intercession of the gods, contemporary writers and directors use DID. Such high profile depictions have provided consistent cultural models for not only sincere DID—i.e., there is no debate within the plot as to the veracity of DID as a diagnosis—but also factitious—that is, faked DID (cf. *Fight Club* [Fincher, Palahniuk, and Uhls 1999] for an example of the former and *Primal Fear* [Hoblit, Diehl, and Shagan 1996] for the latter). Critics argue to varying degrees that all cases of DID currently diagnosed have been modeled ultimately on Thigpen and Cleckley's description of Eve in the book and subsequent movie (Merskey 1995; Rieber 1999; Spanos 1996; Spiegel and Borch-Jacobsen 1997) and that an association of DID with childhood sexual abuse came only after the later 1976 movie *Sybil*<sup>8</sup> (Petrie, Schreiber, and Stern 1976; Schreiber 1973). On the other hand, many others argue DID is part of the continuum of dissociation and that, while there may be cases of healer-induced or faked DID, such cases should not be discounted and very likely occupy different positions on a spectrum of dissociative disorders (Ross 1997) as illustrated in Figure 2.5.

This argument is not an anthropological argument so much as it is an argument within Euro-American culture. In other words, anthropologists do not necessarily doubt the veracity of DID in the same manner that they do not doubt the emic explanations for PT or shamanic behavior. The fact that behavior appropriate to be recognized as DID may be induced by a healer or emulated by an attention-seeker makes little difference when viewing it a part of the holism of cultural practices. But in analyzing any culturally relative or universal behavior, there are levels that must be distinguished and, as may be clear by now, at which all dissociative phenomena can be analyzed. The first is the

behavioral level. What is the behavior that is being exhibited? This includes the phenomenology and much of the emic description. The second is the mechanistic level. How does the behavior happen? This includes the gross cause and effect, possibly a proximal function, and the physiology. It may also include emic information. The third level is the evolutionary level. Why does the behavior happen? It includes the distal function, if there is one, and the relationship to other phenomena or to a broader rubric.

*Figure 2.5 Dissociative continuum including iatrogenic and factitious DID*



This scale is a simplifying model that conflates states and disorders as though dissociation is a unitary phenomenon. The purpose of such oversimplification is to suggest hypothetical positions in the dissociative disorders paradigm for Ross's (1997) DID typology, which includes factitious, iatrogenic, and childhood neglect pathways, based on "amounts" of dissociation involved. This model is adapted from Brown (2006:9), who actually uses it to illustrate the fallacy insinuated by unitary models of dissociation. As dissociation is a psychological concept that describes a variety of phenomena, it represents numerous brain mechanisms that interact with environmental influences. As such, this model may be best conceived of as representing degrees of environmental influence on dissociation mechanisms, the intensity of the repetitive biolooping of these mechanisms (as discussed above), or, most likely, an interaction of the two.

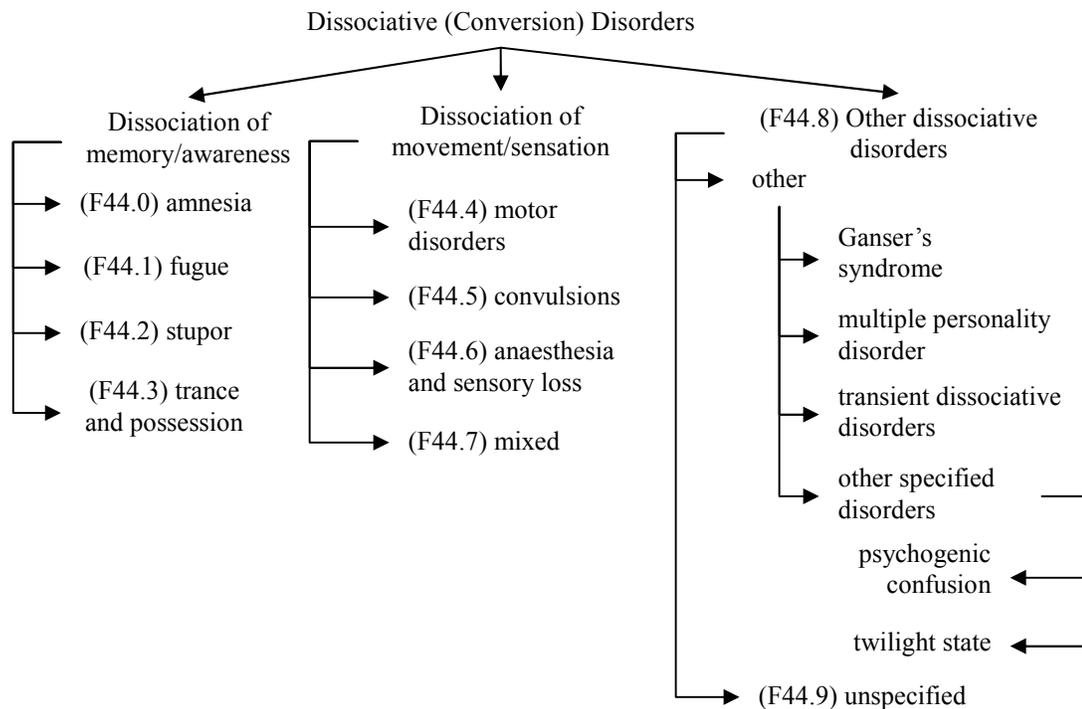
The review of the DID literature in the following sections is organized in accordance with these levels to an extent. The first section describes the phenomenology or what behavior constitutes DID, while the second sections examines DID's etiology and function. This review is important to place dissociative disorders in the context of the dissociation continuum and because physiological studies of dissociative disorders have shed much light on how dissociation might work. A model developed to distinguish the

types of DID was also drawn upon to create the glossolalia typology that will be discussed in later chapters.

### 2.3.1 Phenomenology of the dissociative disorders.

The five categories of dissociative disorders outlined in the *DSM-IV-TR* are dissociative amnesia, dissociative fugue, depersonalization disorder, DID and dissociative disorder not otherwise specified (DDNOS). This section will outline the phenomenology of each of these but with particular attention paid to DID because of its uniqueness and the abundance of literature related to it, as well as to the sub-category of DDNOS dissociative trance disorder because of its relevance to other cross-cultural forms of dissociation previously discussed.

Figure 2.6 ICD-10 dissociative disorders



First, however, it should be pointed out that the *DSM* system has been designed

and maintained as part of a larger effort in psychiatric standardization. Standardization facilitates consistent diagnosis and treatment throughout the field and the collection of reliable epidemiological information. The international standard upon which the *DSM* system is based is the *International Classification of Disease, 10<sup>th</sup> Edition (ICD-10)* published by the World Health Organization (2004). Yet, with regard to dissociative disorders, the *DSM-IV-TR* is different in several significant ways from the *ICD-10*. For instance, the *ICD-10* considers dissociative disorders to be synonymous with conversion disorders, listing the section as “Dissociative (conversion) disorders” (WHO 1992:151), whereas the *DSM-IV-TR* categorizes conversion disorders under the larger rubric of somatoform disorders. Because of this the *ICD-10* also includes ten categories of dissociative disorders, instead of just five, that can be placed into one of three groups as outlined in Figure 2.6 (the ten categories are numbered F44.0-F44.9). The majority of the research in the field of dissociative disorders cites the *DSM* rather than the *ICD*, which may be symptomatic of these differences. “The lack of diagnostic comparability” between the two has been blamed for possibly making dissociative disorders more difficult to diagnose (Alexander, Joseph, and Das 1997; Tousignant 2002:1; van der Hart 1993). Discussion of *ICD-10* categories will therefore be restricted to those that correspond to the *DSM-IV-TR*.

It must be noted that absent from both the *DSM* and *ICD* conceptions is the wider Janetian perception of dissociation as noted by psychologist Ellert Nijenhuis (2004). Beginning with Charcot, hysteria was viewed largely in terms of mentalizing, whereas Janet (1965; 1977) stressed the integration of the mental and physical in all organisms and argued against dichotomizing the two. While conversion hysteria is categorized as

somatoform and dissociative disorder in the DSM and ICD, respectively, Nijenhuis has returned to this Janetian paradigm to make the argument that conversion hysteria is actually subsumed by the category somatoform dissociation. This conception draws the psychiatric-adaptive model of dissociation into even closer alignment with the anthropological-discursive one, as suggested by Table 2.1 from Nijenhuis (2004:13).

*Table 2.1 A phenomenological categorization of dissociative symptoms*

	Psychological dissociation	Somatoform dissociation
Mental stigmata, or negative dissociative symptoms	Amnesia Abulia (will) Modifications of character (loss of character traits, predominantly affects) Suggestibility	Anesthesia (all sensory modalities) Analgesia Loss of motor control (movements, voice, swallowing, etc.)
Mental accidents, or positive dissociative symptoms	Subconscious acts, hysterical accidents, and fixed ideas Hysterical attacks Somnambulism Deliriums (dissociative psychosis)	Subconscious acts, hysterical accidents, and fixed ideas: singular intrusive somatoform symptoms which influence the habitual state Hysterical attacks: complexes of somatoform symptoms which influence the habitual state Somnambulism: alterations of state, which involve complex somatoform alterations Deliriums: alterations of state, which involve grotesque somatoform alterations and enduring failure to test reality

\*Taken from Nijenhuis (2004:13)

Janet distinguished hysterical symptoms as comprising *mental stigmata* and *mental accident* types. Mental stigmata are the negative or often maladaptive types of dissociation, resulting in modifications of character traits and losses of function, such as anesthesia (loss of sensation), amnesia (loss of memory), and abulia (loss of will). Mental accidents are the atypical but likely adaptive or positive types of dissociation that intrude into otherwise normal consciousness or streams of affect, including atypical sensations, movements, and perceptions. Both mental stigmata and mental accident involve psychological and somatoform features. Simplifying models of dissociative phenomenology, however, can make use of a mind/body dichotomy to clarify the

importance of including somatoform dissociation in the Western dissociation paradigm (Kihlstrom 1992). Therefore, in Table 2.1, somatoform dissociation refers to symptoms that phenomenologically involve the body as apparently uncontrolled by the conscious mind while psychological dissociation refers to behavior and affect or flow of ideas and functions as they normally constitute personality (Nijenhuis 2004:12).

#### *2.3.1.1 Dissociative amnesia*

The existence of different types of memory systems may account for the difference in dissociative disorders (Spiegel, Frischholz, and Spira 1993). Dissociative amnesia is a functional disorder of episodic memory, which means it involves the impairment of first-person recollection of certain events but not the loss of procedural memory. It involves the loss of discrete time periods, from minutes to years—often memories related to trauma—which can vary day to day and between investigators and is not merely vagueness of memory or recollection. It is not the result of brain trauma or neural degeneration, as with surgery, brain injury, or diseases like Alzheimer's (First and Tasman 2004:1031-1032; WHO 1992).

#### *2.3.1.2 Dissociative fugue*

Dissociative fugue is a sudden unexpected travel away from one's home or workplace involving a confusion of identity or assumption of an alternate one because of an inability to remember all or parts of one's life. Thus it involves dissociation of episodic memory but also includes somnambulant autonomic motor behavior, including the maintaining of self-care. Individuals are amnesic to making the trip but may appear normal to observers (First and Tasman 2004:1034; WHO 1992:155).

### 2.3.1.3 Depersonalization disorder

Depersonalization disorder is the sensation that one is outside of one's body looking in. This is a normal experience that becomes a disorder when it is to the extent that individuals are disturbed by it, are impaired in functioning, and feel as though they are "going crazy." It involves feelings of unreality, detachment, or estrangement from self and frequently co-occurs with anxiety, panic, phobia, and other symptoms. Also, it is a frequent symptom or side effect of post-traumatic stress disorder (PTSD), alcohol/drug abuse, some prescription medication, stress, and sensory deprivation (First and Tasman 2004:1035-1036). While the *ICD-10* description mostly mirrors the *DSM-IV-TR* with regard to phenomenology, the *ICD-10* classifies "depersonalization-derealization syndrome" as an "Other neurotic disorder" and adds that individuals find their environment colorless, lifeless, or otherwise anomalous and that those around them act in a contrived manner. There is a complaint of a loss of emotion and, not coincidentally, depersonalization-derealization is comorbid with or in the context of depressive illness, phobic disorder, and obsessive-compulsive disorder (WHO 1992:171-172).

### 2.3.1.4 Dissociative identity disorder

The *DSM-IV-TR* defines DID as

the presence of two or more distinct identities or personality states...that recurrently take control of behavior...there is an inability to recall important personal information, the extent of which is too great to be explained by ordinary forgetfulness...The disturbance is not due to the direct physiological effects of a substance or a general medical condition...Each personality state may be experienced as if it has a distinct personal history, self-image, and identity, including a separate name...Particular identities may emerge in specific circumstances and may differ in reported age and gender, vocabulary, general knowledge, or predominant affect. Alternate identities are experienced as taking control in sequence, one at the expense of the other, and may deny knowledge of one another, be critical of one another, or appear to be in open conflict. [APA 2000:484]

The *ICD-10* only minimally addresses DID, which is perhaps a testament to its greater

prevalence in the United States than in any other countries of the world. Additionally, the *ICD-10* maintains the original label of “multiple personality disorder” and relegates it to a subcategory of the generic “Other dissociative (conversion) disorders.” The full extent of the *ICD-10* description is as follows:

This disorder is rare, and controversy exists about the extent to which it is iatrogenic or culture-specific. The essential feature is the apparent existence of two or more distinct personalities within an individual, with only one of them being evident at a time. Each personality is complete, with its own memories, behaviour, and preferences; these may be in marked contrast to the single premorbid personality. In the common form with two personalities, one personality is usually dominant but neither has access to the memories of the other and the two are almost always unaware of each other’s existence. Change from one personality to another in the first instance is usually sudden and closely associated with traumatic events. Subsequent changes are often limited to dramatic or stressful events, or occur during sessions with a therapist that involve relaxation, hypnosis, or abreaction. [WHO 1992:160]

Secondary characteristics of DID fall on a spectrum of normal to severe and include items such as “missing time; coming out of blank spells in unfamiliar surroundings, unsure of how one got there; being told of disremembered events; finding objects present or missing in the environment that cannot be accounted for; distinct changes of handwriting; referring to oneself as ‘we’ or ‘us’; and auditory hallucinations, which may include voices commenting, voices conversing with one another, command hallucinations, and other variations of internal voices and conversations” (Ross 1996:14).

There are three factors involved in dissociation: (1) absorption-imaginative involvement, (2) amnesia, and (3) depersonalization. Absorption is the most common, while the latter two, especially when measures of them increase, are associated with psychopathology (Ross 1996:10). For this reason, when psychometric measures of dissociation are low, as in general population studies, inter-rater reliability is low and, conversely, high in assessments of severe DID (Boon and Draijer 1993; Frankel 1990).

The phenomenology of DID is consistent cross-culturally as assessed in the United States, Canada, the Netherlands, and Japan; and nowhere in the world has a different form been reported (Ross 1996:13-14). The primary manifestation is that severely traumatized individuals have formed alternate personalities or *alters* separated by varying degrees of amnesia from their *core* or regular personality to deal with stressful situations. These alters have such completely different habitus as to be considered distinct persons residing in the same body and behave as core personalities need to or, in some capacity, wish they could behave. These disruptions in the normal integration of personality “appear to involve the partitioning of autobiographical memory among different part-selves, or self-narrative strands” (Seligman and Kirmayer 2008). In the case of Eve White (whose real married name was Chris White), the core, was demure, sad, and ineffectual; whereas alter Eve Black (in reality, called by her maiden name, Chris Costner) was a brash and assertive spitfire; and alter Jane was calm, thoughtful, and rationally perceptive (Sizemore and Pittillo 1977; Thigpen and Cleckley 1957).

Like the spirits of vodou or *zār*, the distinct personalities of DID victims are immediately recognizable, once one gets to know them. They are not cultural icons that just anybody would know. Each patient creates his or her own personalities, which, once introduced, become familiar to those who know them. For instance, Thigpen and Cleckley refer to the flash of Chris Costner’s clothes, especially as relative to Chris White’s conservative ones. Even when Chris Costner did not have time to change after coming out, she was conspicuous “at some distance, from her bouncy gait, confident carriage, and general air of well-being and energy” (1957:127). Jane was “clearly civilized and unaffected.” She displayed an “alert and thoughtful expression,” and her

equally distinct way of walking was “unobtrusively eurythmic and perfectly feminine” (1957:127). Chris’ sister Tiny, who got to spend time with Jane, also knew her to be “shallow, selfish, jealous, and...so vain that her greatest enjoyment was having her picture taken” (Sizemore and Pittillo 1977:304-305). Sybil’s (real name Shirley Ardell Mason) alters were constructed likewise. An appearance by Peggy Lou was instantaneously apparent because not only was “her behavior uncharacteristic[,] but also...she looked and sounded different. She seemed smaller, shrunken...The voice unlike Sybil’s voice...And the word jist. Sybil, perfectionist schoolteacher, strict grammarian, would never use a substandard word such as jist” (Schreiber 1973:47). At only her second appearance at a therapy session as Peggy, “the doctor had no difficulty recognizing her” because she was hatless and gloveless, unlike the prim and proper Sybil (Schreiber 1973:50).

DID victims initially experience their conditions as “lost time” (Schreiber 1973:96) or “blackouts” (Thigpen and Cleckley 1957:27), which are periods of amnesia. They are told by others that they have behaved in ways and done things that they do not recall and in some cases deny, as with Eve White (Thigpen and Cleckley 1957). These periods can be very brief, or they can last for years, as when Peggy Lou took over Sybil’s body from the middle of third to fifth grade (Schreiber 1973:118). When patients eventually begin therapy, they may appear only to have fugue disorder, as was the case with Sybil (Schreiber 1973:49). But fugues are more akin to dual consciousness than DID, involving only episodic compartmentalization and extended somnambulistic behavior. DID is distinguished by its marked complexity and alters’ unambiguous individuation on a long-term basis.

DID is thus most like the other forms of culturally relative dissociation that have

been discussed. It is more similar to PT than shamanic soul journeys, and this may be due to the socioeconomic structure of cultures that recognize DID. As previously stated, despite this development, there is not a distinctive ritual pattern of recognizing this dissociation, so, though there is a medical model for contending with it, this model has an uneasy relationship with culturally relative forms of dissociation outside of industrialized cultures. This becomes a problem as individuals from such cultures immigrate to industrialized countries or theorists attempt to rectify all forms of dissociation to this medical model. The following section on dissociative trance disorder outlines how these forms of possession are viewed in this model.

#### 2.3.1.5 Dissociative trance disorder

The final *DSM-IV-TR* category is DDNOS and includes any impairment of functioning with dissociation as a primary feature that is not described by the other categories.

Significant among them is the primary subcategory dissociative trance disorder (APA 2000). DID/MPD and trance disorder are categorically analogous when comparing the *DSM-IV-TR* and *ICD-10*. In the *DSM-IV-TR*, DID is a main category and trance disorder a subcategory of what essentially amounts to “miscellaneous,” while in the *ICD-10* “Trance and possession disorders” is a main category and MPD a subcategory of miscellaneous. Again, this may relate to the cultural relatively of these disorders—i.e., DID has a greater prevalence in the United States, where possession phenomena are rare outside of ritual contexts, and PT disorder has a greater prevalence outside of the United States, where MPD is rare and there is a long cultural history of spirit possession (First and Tasman 2004:1043). This cultural distinction is reflected in Table 2.2. “Dissociative trance disorder” or “possession and trance disorder” both include occasions wherein

trance takes place without a replacement of identity or personality or a spirit possession takes place outside of a ritualized context and is not accepted as part of a collective cultural or religious practice; and, in both cases, the dissociation causes significant clinical distress and social, occupational, or other dysfunction (First and Tasman 2004:1043-1046; WHO 1992:156-157).

These disorders are generally unseen by most *DSM* users, and, thereby, this section betrays a limit to the anthropological usefulness of the *DSM-IV-TR*. It mentions relatively few actual disorders by name and is restricted to mentioning only those disorders that grossly manifest as a state of trance or possession. It leaves out disorders that may not be characterized primarily by dissociation but are nevertheless culturally-relative pathologies that manifest dissociative characteristics.

*Table 2.2 Characteristics of dissociation in western and eastern cultures*

Dissociative Phenomenon	Western	Eastern
Splitting of consciousness	Depersonalization	Dissociative trance
Splitting of identity	DID/MPD: multiple internal identities	PT: control by external identities
Splitting of memory	Dissociative amnesia	Secondary in dissociative trance, more common in PT
Loss of somatic control	Conversion disorder	Dissociative trance, e.g., <i>latah</i> , <i>ataque de nervios</i>
Treatment	Therapist induces dissociation in subject, often with hypnosis	Healer enters trance or dissociative state to take on offending spirit

\*Taken from First and Tasman (2004:1044)

There is a variety of such disorders, which ultimately have no unifying principle save this foreignness as a culture-bound syndrome (Hughes 1985a), yet they fit within the dissociation spectrum or continuum. A short list of culture-bound syndromes marked by dissociation (Hughes 1985b) includes Guatemalan *colera*, Peruvian *colerina*, Southern Black (U.S.A.) “falling-out,” Bahamian “black out,” New Guinean *guria*, Taiwanese *hsieh-ping*, Shonan (southern Africa) *kupenga kwechitsiko*, Malaysian/Indonesian *latah*,

Greenlandic Eskimoan *nangiarnek* (kayak angst), New Guinean/Papuan *negi-negi*, Ceylonian *pissu*, Central Eskimoan *quajimaillitup*, Korean *shin-byung/sin-byung*, and Inuit/Yuit *uqamairineq*. These disorders cover a variety of dissociative behavior. Some, such as *pissu* and *shin-byung/sin-byung*, are forms of PT that, like the previously discussed *zār* cults, are not voluntary but are ritualized. Most are described as exhibiting dissociative symptoms or trance-like behavior without clarifying what that entails, though presumably amnesia, depersonalization, and derealization are primarily involved. Others, such as *hsieh-ping*, *pibloqtoq*, and *quajimaillituq*, are implicated as exhibiting glossolalia, which may entail a de facto trance state (Goodman 1972).

The DDNOS category of dissociative disorders is a miscellaneous category that cannot be easily rectified to the biomedical model of dissociation. This is likely because DID and the other dissociative disorders are largely culturally defined within Euro-American cultures, while DDNOS and particularly dissociative trance disorders are defined by the cultures where they predominate. The biomedical model of dissociative disorders and culturo-religious belief systems in which dissociative trance disorders are embedded are largely incongruent. While glossolalia has not been diagnosed in these categories, it shares many of the stress-reducing characteristics and cultural constructions, which makes such categorization of culturally relative dissociation problematical. The following sections outlines these characteristics with respect to DID, which, given the etiology, render it highly functional as part of this same stress-reduction paradigm.

### *2.3.2 Phenomenology, etiology, and functions of DID.*

If possession cases within the psychiatric populations of Western hospitals do not serve the same social purposes as those of ceremonial PT, their functions for individuals appear

similar. While no longer considered “clever fakers” (Herbert 1982:356), the question still remains regarding whether alters develop spontaneously or are molded into their infamous form by the attention and validation of therapists. The evidence would seem to argue for an etic somewhere in between. While extreme disturbances in temperament are reportedly encountered in earlier stages of patients’ lives, these disruptions are not generally identified as separate personalities at the time (Thigpen and Cleckley 1954:133-134). However, one of the apparent purposes of alters is, essentially, to attract necessary attention and validation for the psyche. Chris Costner Sizemore expresses confusion herself over how her dissociation came easier in therapy. It was, she says, “a pleasure to oblige the doctor” (Sizemore and Pittillo 1977:261-262). “Here is an important and busy man taking time to methodically play the game with her. The desire for acceptance and recognition is a bottomless pit in the human soul. If it cannot be attained in one way, it will be attained in another” (Sizemore and Pittillo 1977:278). The skills that are needed to cope with stressful situations—to make friends, to navigate the social paradigm—may be unavailable to the core personality; therefore the alters of individuals handle such chores and respond to doctors’ validation because it is what the core needs and desires but does not know how to accept. This is similar to the roles played by the spirits in possession vodou and zār possession cults.

It is important to remember that, unlike possession cults, appeasement or acknowledgement of alters does not unite the community. DID is not a functionally integrated part of society. People with this condition are called “victims,” “sufferers,” and “patients.” They live in mental hospitals or go to therapy sessions on a daily basis. Some try to kill themselves and others. But dissociation seems to be more a means to

survive than to die. Indeed, alters often express a strong desire to live, whereas the cores seem significantly less interested. Cores are scared to interact with people. They are isolated and damaged and cannot function in the social paradigm without the intercession of their alters. Disruptions in psychic development occurred at an age when they did not yet have the necessary defenses to cope and still conform to the socializing elements of their respective environments. This is the period when the brain and nervous system are wired up with the linguistics and social syntax of its culture (Ornstein 1991:9), so traits that develop during this period stay with a person for life.

One of the primary debates surrounding DID and which goes to the heart of its controversy as a diagnosis is its cause. At one extreme are those who maintain it is a very rare condition that manifests before the age of seven and only occurs as a result of the real, immediate, and terrifying fear of being killed in the course of physical or sexual abuse (Allison 1996; 2005). At the other are those who recognize DID and dissociative disorders in general as an umbrella under which a range of disorders associated with dissociation fall. These disorders are often the result of a functional psychological compartmentalization that occurs in childhood as a result of some trauma but which becomes dysfunctional in adulthood when circumstances have changed. But they also include manifestations that occur after childhood, as well as conversion disorders (a type of psychosomatic illness), which are currently classified by the *DSM-IV-TR* as somatoform disorders (cf. Ross 1994; 1997). However, as stated above, the international psychiatric community considers dissociative disorders to be synonymous with conversion disorder (WHO 2004). This is a debate internal to the field akin the recognition by Haitians of whether a person is genuinely possessed by a loa and a more

fine-grained debate as to which loa it is; it is not a debate about whether a phenomenon exists or not. I will discuss a similar conflict in later chapters with regard to Pentecostal glossolalia, wherein there this also often internal disagreement as to whether individuals have received the Holy Spirit or not.

*Table 2.3 MPD/DID typology*

	Allisonian MPD	Childhood Abuse DID	Childhood Neglect DID	Factitious DID	Iatrogenic DID
Age of Onset	Before 7	By 10	Childhood	Adult	Usually adult
Predominant Personality Type		Borderline	Dependent	Antisocial	Dependent
Hypnotizability		++	+	?	+
DES Score		40	30	70	70
Type of Therapy		DID	Modified DID	Factitious DID	Cult exit counseling
Response to Treatment		Integration	?	Remission/ chronic	Remission
Type	Trauma model	Trauma model	Trauma model	Factitious model	Destructive psychotherapy- cult model
Attachment to Perpetrator DID		+/-	-	-	+
Symptoms Prior to Therapy		++	+/-	-	-
Elaborate Medical History		+/-	-	++	-

\*Adapted from Ross (1997:64)

An anthropological perspective requires allowing for the most encompassing emic definition and distinguishing sub-types within. As a useful starting point, Ross (1997:64) has developed a 4-part typology based on cause/effect pathways as outlined in Table 2.3. Ross's four pathways include childhood abuse, childhood neglect, factitious, and iatrogenic (1997:61-71) (see Figure 2.5 for relative positions in the dissociative disorders continuum). This typology distinguishes types based on the typical age of symptom onset; predominant clinical personality type; hypnotizability (high or very high); average

score on the DES (which will be discussed in more detail in chapter 3); the type of therapy merited; the typical response to therapy; the causative type; the attachment (high/low) to a trauma perpetrator; the manifestation of DID symptoms prior to entering therapy (very high/high/low); and the extent of a preexisting, related medical history. This model is based on the codified definition in the *DSM* and does not insinuate that types are discrete or mutually exclusive. It is also speculative in part and warrants further objective validation. In including “fake” and “induced” as types, Ross points out that there is nothing in the *DSM-IV-TR* about age of onset or etiology. “Using the rules of the *DSM* system, an iatrogenic case of DID is just as ‘real’ and ‘genuine’ as one with the onset in childhood” (Ross 1997:63). Additionally, including Allisonian MPD acknowledges the debate that persists as to the possibility of multiple personalities versus dissociated identities of one personality.

Dissociation in general is what Walker (1972) terms “regression in service of the ego” and in this capacity serves as a defense mechanism. She notes that this is a normal phenomenon but not necessarily one that individuals have the capacity to cope with if the regression, for whatever reason, is of a significant magnitude.

Until or unless a person’s regressive symptoms are coordinated with one of these subsystems provided by his culture for the temporary restructuring of his ego, he has neither guidelines nor security in his regression, and it can get out of control. There seem to be two general reasons, psychological and socio-cultural, for not participating in this culturally patterned method of regression. The people who show the symptoms but never socialize them by responding to the gods are probably severely neurotic or psychotic, having such idiosyncratic understandings and attitudes that they can not adapt them to the culturally prescribed patterns. People who are socially and culturally distant from the milieu where possession behavior is the norm have no culturally approved method of regressing or of acting out their desires and fantasies, thus their gratification of such needs can only be done idiosyncratically. [Walker 1972:39]

There is a psychological disconnect that separates the horror of abuse from awareness to

enable an individual to function in the same way that pain can be disconnected to continue exercising. But in the childhood abuse pathway, there is not just the compartmentalization of trauma but the formation and maintenance of attachment (conceived of perhaps as “love”). This is in some ways analogous to a wife who stays with an abusive husband because she is dependent on him *except* that she is in the adult stage of development, not the attachment.

Bliss (1980; 1984) sees this multiplicity as a normal defense mechanism put to extraordinary use, akin to the deep trance states exhibited in animals when under attack by predators. The trance protects the animal from manifesting the somatic signs of anxiety (Holmes, Brown, Mansell, Fearon, Hunter, Frasilho, and Oakley 2005; Sierra and Berrios 1998) and instead simulates death, whereupon the predator abandons its attack. It may also provide the analgesia to enable the animal to withstand extreme duress or exhibit unusual strength or temerity (Ross 1997). If it survives, post-trance amnesia or distortion may protect it from crippling post-traumatic phobia related to the attack (Volgyesi 1963). The absorption and suggestibility of trance states may enable abuse victims to concentrate intensely on surviving and being automatically obedient in the face of repeated attacks, which is an adaptive response when there is no recourse to retreat (Goodwin and Sachs 1996:94).

Unlike animals, the trance of DID takes on an elaborated sophistication to contend with and filter the sophistication of human consciousness. Each alter is relevant to and functions for certain aspects of the social paradigm. The DID alter is the paradigmatic equivalent of the loa functionally, but the syntax within their respective social equations is quite different. Like most religions, Vodou is a whole lifestyle, a

means of socialization, a community, a culture and involves express habitus that are the result of historical psychocultural processes and implicit in all behavior of initiates. It provides a flexible template for the expression of an extremely poor population that has little chance for social mobility for generations on end. Like loa, alters mirror the range of possibilities in the individual's social world with which the personal must deal. And like the loa, with each new crisis or stress, a DID will generate a new alter whose specialty becomes that syntactic aspect of the person's world. This was seen when Sybil manifested the previously unseen Blonde, representing her unlived adolescence, to deal with and facilitate her impending integration (Schreiber 1973:397-398), while Eve provided Jane. Ross points out that

in our culture, the traumatized girl creates a tough secular adolescent male protector personality, while in another culture the protector would be a deity, spirit guide, or mythological figure. There is variation at the level of content, but the structure is probably universal. In many cultures, extreme forms of dissociation are normal and even prized and sought after through study, fasting, self-immolation peyote, solitude in the wilderness, or other techniques. [1996:4]

DID thus appears to be a very functional form of dissociation not unlike that manifested by abused animals but entailing all the sophistication of human psyches and cultures that animals lack. Dissociation operates normally as the psychological aspect of stress response but under extraordinarily stressful conditions. Understanding the phenomenology, cause, and function of dissociation in DID is important because it features this stress function. It essentially represents the stripping away of ceremony and ritual that mask the function of dissociation in other contexts and reinforces this biological basis. This is important in the next chapter, as this model of dissociation as predisposed to deal with stress is the lens through which this study is viewed. The following section introduces speaking in tongues, the focus of this study.

#### 2.4 SPEAKING IN TONGUES

The emic of speaking in tongues is that it is the communication of spirits or deities through believers or initiates. It takes place during religious ecstasy and has been observed cross-culturally. It has appeared throughout history as part of Christian revitalization movements and in pagan, shamanic, and other mediumistic contexts (Hine 1969; Rose 1997). It is scientifically referred to as glossolalia, meaning to use an unintelligible vocalization. In Christian usage there are also claims of *xenoglossy*—speaking in an unlearned foreign tongue—though *xenoglossy* and glossolalia are generally not distinguished by practitioners (Anderson 1979; Goodman 1988). With the exception of an occasional word glossolalia is not a linguistically intelligible language, though it is structurally similar across cultures (Goodman 1972).

Speaking in tongues is a gift of the Spirit that connotes acceptance of Jesus Christ. It is an accepted practice among all Pentecostals and Charismatics, but its emphasis varies among denominations (Cleary 1997). According to biblical account speaking in tongues by Christians first occurred during the Pentecost, a prominent feast day. “And they were all filled with the Holy Ghost, and began to speak with other tongues, as the Spirit gave them utterance” (Acts 2:2-4 [KJV]). Non-Christian glossolalia extends back at least as far as the renowned Oracle of Delphi. Apollo is reputed to have spoken through the priestess there (the Pythia) in unintelligible utterances (Dunn 1997; see Forbes 1986 for refutation of this). Ecstatic practices were common throughout religions of the Old World and considered fundamental in Gnostic practices, which were undergirded by Hellenistic pneumatology, the attainment of miraculous powers through possession by “pneuma” or Spirit (Anderson 1979).

Socialization is required to properly speak in tongues, and, though there is cross-

cultural consistency, there are also idiosyncratic utterances of groups or denominations that become familiar to members as God's word (Goodman 1972). This type of learning is typical and may help explain why dissociative behavior cross-culturally, though similar in many important features, has such disparate appearances. Children brought up in the church may innocently practice glossolalia behavior long before 'practicing' becomes considered blasphemy or work of demons. I have observed small children in church aping the trance behaviors of others. One informant told me, "I listen to my kids sometime, and they can mimic everyone in here because they hear that repetition all the time, and they just rehearse it when they get a chance."

This mimicry is integral to socialization, as children are universally attentive to the micro-behaviors that go into making "an accomplished adult—a way of walking, a tilt of the head, facial expressions, ways of sitting and of using implements, always associated with a tone of voice, a style of speech, and...a certain subjective experience" (Bourdieu 1977:87). Learning this motor behavior alone does not constitute the habitus of Apostolic behavior but is *doxa*—i.e., "undisputed," "undiscussed," "self-evident," ignorance of an alternative (Bourdieu 1977)—to its socialization. There is no specific teaching of appropriate movement, but it is picked up along the way, ostensibly without the intent of lately manifesting it involuntarily. But along with these motor behaviors, one must also absorb the explicit and implicit moral code. Apostolic principles require express acceptance of the orthodoxy or moral code, not mere "mechanical learning by trial and error" (Bourdieu 1977). True socialization and manifestation of Apostolic cultural competence, for children and adults, is a historical process that involves the assimilation of

the product of the systematic application of principles coherent in practice, which means, that in all this endlessly redundant material, [they have] no difficulty in grasping the *rationale* of what are clearly series and in making it [their] own in the form of a principle generating conduct organized in accordance with the same rationale [Bourdieu 1977:84-88].

This is not to say that these children and converts must merely intuit proper behavior. Indeed, every service is redundant with express lessons in appropriate and moral behavior. Among the congregations in this study, Friday nights are “youth services,” which involve explicit discussions and games all directed to reproduce the principles of practices, as stated, in historical series. As such, socialization amounts to “apprenticeship through simple familiarization, in which the apprentice insensibly and unconsciously acquires the principles of the ‘art’ and the art of living—including those which are not known to the producer of the practices or works imitate.” Such ‘art,’ in this case, is the gifts of the Spirit, which only God can give but which the socialization process inculcates the capacity for through “at the other extreme, explicit and express transmission by precept and prescription” (Bourdieu 1977:88).

#### *2.4.1 Glossolalia as dissociation.*

To understand how the study of glossolalia in particular can shed light on dissociation as a whole it is important to outline what characteristics qualify tongues as a dissociative phenomenon. Typical characteristics of dissociative trance and glossolalia include varying degrees of “disabling of judgment, disabling or limiting of volition, decrease of body awareness including eye fixation and immobility, an increase in the vividness or number of visions or hallucinations, inability to perform some mental functions and increased ability to perform other functions” (Wier 1996:104-105). Not all of the characteristics are readily apparent, especially in experienced ritual dissociators, who can

often exert more conscious control than those with less experience. Memory effects (both enhancing and diminishing) are typical of glossolalia; informants in this study poignantly recalled of their first glossolalia experience in particular. Emotionally charged and novel experiences are typically memorable at a gist level, while details tend not to be apprehended or quickly fade (Burke, Heuer, and Reisberg 1992). Some informants report visions. One related the experience of glossolalia as he was being pulled from water baptism by Jesus and Moses, who were really two church elders. Another informant was primed for Pentecostal conversion by seeing demons in her mirrors she believes were drawn to her as a byproduct of her previous vocation as a New Age healer.

Reports of auditory experiences only initiates can hear are common among Pentecostals. The passages in Acts (2:1-12 [KJV]) that are the basis for Pentecostal belief in tongues actually report an incident of xenoglossy among the Apostles, who were understood by peoples of all nations gathered for the feast of the Pentecost. One of my informants reports that preaching he did in the Philippines was understood by the locals as Tagalog, though he claims no experience in that language. Xenoglossy has been reported only rarely (cf. Stevenson 1974; 1984) but is a commonly reported though undocumented feature of Pentecostalism. It is not possible that the Apostles were actually speaking several languages simultaneously, but it is possible that a mass of people primed by the same ritual experience could have internal sensory experiences of hearing in their own languages. Evidence supports that at the neural level hallucinations and sensory responses to commonly experienced sensations appear to be indistinguishable (Shergill et al. 2000; Silbersweig et al. 1995).

Sociolinguist William Samarin points out that although both glossolalia and

xenoglossy have a long history in the era of the apostles, even preceding the incident outlined in Acts, there is perhaps an equally long-standing debate as to the legitimacy of glossolalia as divine speech. Traditional Pentecostals don't recognize a difference between glossolalia and xenoglossy, but Christians critical of Pentecostals insist that divine language of the first century were tongues understood by the local community though not known by the person speaking them and thus miraculous speech acts, not strictly divine speech. Another interpretation, in treating the scriptures as a collection of human texts, suggests that Acts is a reinterpretation of the original event, imbuing a highly charged emotional event with the status of miracle by outlining it in terms of xenoglossy (Samarin 1972:15-16).

Other characteristics of dissociative trance are also implicated to some degree in glossolalia, including fixed attention, lack of volition, increased or decreased ability to learn, enhanced self-observation, inability to make critical judgments, increased literalism, and enhanced trance force (Wier 1996). When individuals engage in behavior to invoke God and are actually filled with the Holy Spirit, they are focused almost exclusively on such worship, facilitated by closing their eyes and praying aloud. This fixed attention is maintained even as they move around, forcing others to move furniture out of their way or offer physical support. Lack of volition is reported in most significant cases of glossolalia, wherein informants report being aware of their motor behaviors but unable to control them.

The literalism of dissociative trance may be an artifact of focused attention. Attention is focused on hearing speech uncritically at face value rather than on discerning metaphoric meaning embedded in speech. With glossolalia, individuals are focused on

their experiences with God and capable of hearing basic instructions and prescriptions for behavior but not in a frame of mind to absorb more metaphoric sermons. This is not to say that the Apostolic ritual does not contain both, but there are distinct portions of services devoted to sermons and to altar time and anointing, which are kept separate and differ in appearance to even a casual observer. I have observed a pastor request congregants calm their anointing when he wanted to deliver an important message that he knew wouldn't be heard during the ecstatic worship.

Finally, trance force is commonly reported by informants who initially had no intention of going to the altar but felt propelled by an external force and thereby found themselves speaking in tongues. This force is apparent during a service when multiple trance inductors (i.e., rhythmic music, repetitious singing, repetitious movements, repetitious prayer with eyes closed, others nearby speaking in tongues) are operating simultaneously. One can sense or 'feel' that a room is about to erupt in trance behavior.

Like shamans and PT practitioners, Pentecostals have been criticized as mentally unstable because of their ecstatic practices (Hollan 2000; Spiro 1997). On the contrary, studies have affirmed that charismatic glossolalists are no less emotionally stable than the general population (Louden and Francis 2001; Robbins, Hair, and Francis 1999) and may in fact be more stable (Francis and Robbins 2003; Kay and Francis 1995). Additionally, anthropologist Virginia Hine reviewed the theories of psychopathology and found Pentecostal glossolalia instead to be highly functional (1969).

Glossolalia thus shares many characteristics with other forms of dissociation including several aspects of trance and a functional cultural structure. It is central to Pentecostal practice and as such is the primary feature of Baptism of the Holy Spirit, a

rite of passage the following section briefly outlines.

#### *2.4.2 Baptism of the Holy Spirit.*

Baptism of the Spirit, signifying acceptance of Jesus, is the rite of passage to be an accepted member, and the continued manifestation of God through glossolalia is evidence a person is living a life prescribed by Jesus (Synan 2004). Spiritual baptism is distinct from water baptism, but both are steps (along with repenting of all sins) in the Pentecostal baptismal process. Yet a person may speak in tongues but not go through the other steps or may go through the other steps but not receive the Holy Ghost.

Baptism of the Holy Spirit has been described as “the experiential and doctrinal core of the Pentecostal religion” and “first and foremost an act of explosive power” (Chesnut 2000:220). Members remember their first time vividly, quips Latin American historian Andrew Chesnut, even better than the number of children they have (2000:222). Others suggest it is what all new members look toward and current members look for as a sign of Godliness (Bourguignon 1976; Goodman 1972; 1974). It is the mark of a transformation of consciousness and status in the congregation and perhaps marks a transition for some from peripheral to core members of a congregation. One informant who has not yet received it but claims to have been attending services five times a week for over a year reported still feeling like an outsider among all those who had received the baptism of the Spirit. Practitioners report that worship thereafter becomes more meaningful, fulfilling, and sincere.

Hine (1969:222) reports that glossolalists reports themselves as having a greater capacity for love toward others, sense of tranquility and joy, and more confidence after Spiritual baptism. Reports of such transformative affects of Spiritual baptism suggest

physiological changes that may distinguish glossolalists from non-glossolalists, especially if glossolalia is practiced regularly. Several studies by radiologist and neurophenomenologist Andrew Newberg have recently investigated this.

#### *2.4.3 Cultural neurophenomenology of glossolalia.*

Newberg et al. (2006) was the first to use brain imaging techniques to examine two states typical of Pentecostals and Charismatics—singing gospel music and glossolalia. The glossolalic states displayed decreased cerebral blood flow in the frontal lobes bilaterally, significant because the frontal cortex is responsible for self-awareness and executive control and validates the Apostolic belief that God replaces the self. The caudate nucleus of the basal ganglia, which plays a role as part of the limbic system in learning and memory, also displays a reduction in activity during glossolalia compared to the singing state (Newberg et al. 2006).

Comparison to previous neurophenomenological studies of cultural dissociation, including that of Tibetan Buddhist meditation and Christian centering prayer (a method that reduces the hyperactivity of the mind to prepare it for the listening and receptivity of religious contemplation), validates that there are different neural pathways for different forms (Newberg and Waldman 2006). All three studies indicate increased activity in the thalamus portion of the brain, an information integrating depot between the cerebral cortex and other parts of the brain. This system is especially sensitive to negative information, which produces intense limbic activity leading to long-term memory storage, an adaptive function of emotions for remembering danger to protect the organism from harm (Damasio 1994). It is much less sensitive to positive experiences, so maintaining a sense of well-being requires constant reinforcing of positive feelings and

beliefs, as is done through religious rituals. Praying and meditating cause incoming sensory information to be dissociated or tuned out and the self to be oriented toward positive feelings and thoughts. Temporal and spatial orientation is diminished and dopamine released, which is integral to this feeling of well-being by creating a positive feedback loop of further positive thoughts and feelings (Newberg and Waldman 2006).

Culturally relative dissociation appears to affect the information integration region of the brain, and, in the case of glossolalia, the region responsible for executive control or self. This is consistent with the cognitive partitioning model of dissociation, which proposes that it blocks and detours sensory and emotional information. It is likely that similar processes happen during shamanic spirit journeys and other forms of PT as well, though mediated by different personal and cultural experiences.

### *3. SUMMARY*

Dissociation is the partitioning of conscious awareness, whereas trance is the visible state and deafferentation the neural correlates of dissociation. These neural correlates vary depending on the type of dissociation. Dissociation appears cross-culturally and throughout history. Shamanic and PT practices that utilize them are still found throughout the world. It is important to recognize their roles in shamanism, as shamanism is arguably the world's oldest religion and is suggestive of the importance of dissociation in human cultural history. PT is nearly as old and indicates that dissociation is maintained in cultural practice despite changes in social structure. It also mirrors glossolalia in some ways, as glossolalia is a form of possession. Variations of the possession emic were likely a part of pre-Christian, pagan Europe. Even in areas of the world where scientific or biomedical explanations have supplanted religious ones,

culturally relative manifestations of dissociation continue to appear and serve a seemingly consistent purpose, though, especially in situations of trauma, its symptoms and appearance are often actually confused with the real illness. The ethnologic record provides evidence that dissociation is normal, natural and part of fight-or-flight response to stress. Finally, dissociative disorders are a manifestation of this primitive capacity, based on individual need. Though pathological, glossolalia can be viewed as similarly structured within a cultural context. Glossolalia shares many of the features of other forms of dissociation, but, like all forms, varies in its cultural context and acceptability.

This chapter reviewed dissociation's various appearances in stress mediation cross-culturally. The following chapter will discuss some of the models that more precisely describe and explain this role with regard to stress and review some of the methods used to measure stress with regard to the role of dissociation.

### 3. DIATHESIS-STRESS EMBODIMENT OF DISSOCIATION

The current study investigates the relationship between glossolalia as a form of culturally relative dissociation and stress. As chapter 2 outlined, dissociation is believed to reduce or filter stress. This chapter discusses how this might take place and outlines some of the studies conducted with regard to other forms of dissociation to outline and test this model. In order to contextualize the current study among the existing literature on this subject, the first section introduces the two biocultural approaches taken in the literature to understand this relationship—studies of adaptive and of maladaptive dissociation. The next section will briefly review the homeostatic system operations with regard to potential stressors, biological stress response, and what people experience as stress to clarify the methodological rationale for this study. The third section will review adaptive phenomena—or when dissociation works correctly—while the last section covers maladaptive phenomena—when dissociation goes awry.

#### *1. INTRODUCTION TO ALLOSTASIS AND DIATHESIS-STRESS*

This chapter will begin to position dissociation as an evolutionary adaptation or, probably more accurately, a primitive trait that has been exapted to its current use. An *exaptation* is a phenotypic characteristic that is the byproduct of or was naturally selected for something else but for which a new use developed—i.e., it was not evolutionarily selected de novo for its current purpose (Gould and Lewontin 1979). Although modeled as a singular mechanism, dissociation is a reification of complex, disparate phenomena produced by various biopsychosocial interactions. What hypothetically unifies them is some shared neuroendocrine pathways and a functional purpose.

Dissociation is the psychological aspect of stress response. It is an adaptive reaction to a stressor on a short-term basis but can be maladaptive if under- or over-utilized. Dissociation appears to be triggered autonomically, like increased blood pressure and alertness, by stressors, as part of a biogenetic structure that exists widely in the animal kingdom for contending with an abundance of external stimuli too complex for cognitive processing. Brains simplify information by filtering to render it consistent with preexisting information and thereby maintain psychological equilibrium (Laughlin and d'Aquili 1979; Schumaker 1995). In humans, and possibly other higher order primates, it is also used to filter internal information, as exemplified by the integral role of dissociation to facilitate sleep and dreaming (Schumaker 1991).

As part of stress response, dissociation is a key element of the proverbial “fight-or-flight” stress response. Dissociating possible repercussions or culpability can enable one to fight better just as dissociating stressful information or stimuli can be conceived of as mental flight. Consistent with stress physiologist Hans Selye’s (1946) general adaptation syndrome, dissociation is part of a three-stage stress response. Stage one is alarm reaction, wherein the stressor is encountered and there is a diminished resistance. During stage two, resistance rallies and rises above normal. Stage three is exhaustion when continued exposure has outlasted the adaptive resistance. In this paradigm, dissociation becomes adaptive following the acute onset of stress, but if prolonged can become overwhelming, maladaptive, and result in psychological deterioration.

This progression outlines the differences between adaptive and pathological dissociation. Everyday forms of mild dissociation and more extreme ceremonial forms tend to be of specific, finite durations that facilitate functioning and in some cases are

purported to enhance well-being. The prolonged, unchecked dissociation of pathology, on the other hand, may protect individuals from traumatic memories yet be psychologically debilitating in the long run. Based on the documented importance of this pattern of response to stress, an inability to employ dissociation as an effective stress response should also be considered maladaptive, though I am unaware of any studies pertaining to this.

The argument can be made that this is too general a picture of dissociation. For instance, some people who undergo traumatic experiences do not develop pathological dissociation while others do. Current theory regarding stress response is more specific, indicating that very specific effector systems control stress responses through *homeostats*, or psychological regulators, which are compensatory mechanisms that maintain an appropriate homeostasis for a body and its environment (Goldstein 1995). Therefore, there is an array of variables that will be different in any individual's response to stress. They are part of the allostatic system of physiological equilibrium. *Allostasis* is "maintaining stability (or homeostasis) through change" (Sterling and Eyer 1988), and permanent changes may be effected in levels or activities of homeostats (Goldstein and McEwen 2002). Dissociation appears to effect changes in set-points for the activation of stress response (cf. MacLean, Walton, Wenneberg, Levitsky, Mandarino, Waziri, Hillis, and Schneider 1997; Sapolsky 2002; Stefano 1998; 2005; 2001). In fact, Esch et al. (2002) have suggested candidate homeostats for this change and Lichtenberg et al. (2000; 2004) a genetic predisposition.

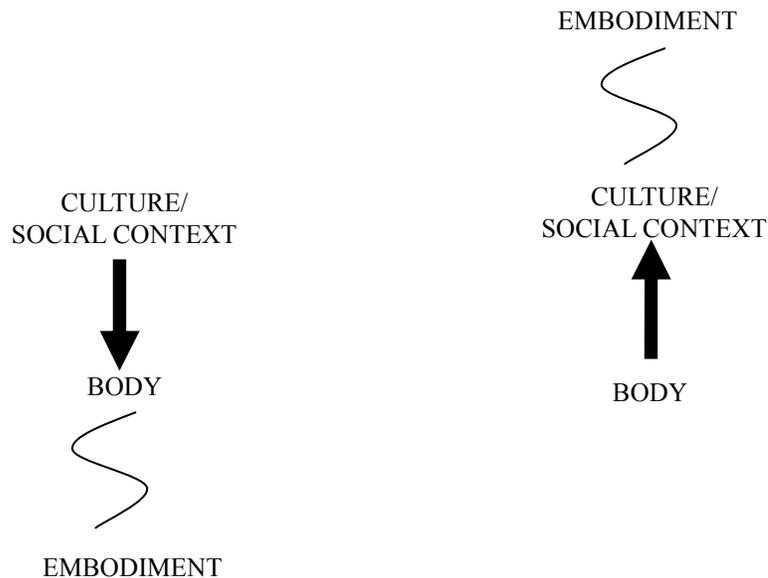
Given this perspective, this chapter essentially reviews evidence supporting a *diathesis-stress* model of dissociation (Butler, Duran, Jasiukaitis, Koopman, and Spiegel

1996), or a predisposition to dissociate in association with stress. As this and the next chapter will discuss, there are myriad data supporting a predisposition in humans for dissociation, but it remains to be seen whether to what extent dissociative capacity also varies, if individuals differentially develop their dissociative capacities to contend with stress or in pursuit of sociocultural behaviors, or if there is a plastic baseline dissociative capacity in humans that can be developmentally amplified or preserved by circumstances like traumatic stress.

Diathesis-stress is a concept drawn from psychiatric literature that works well with the dissociation model, but subsequent discussion will also link this model to the cultural phenomenology of ritual healing as undertaken in anthropology, which also provides useful terminology for capturing sometimes fleeting concepts. Specifically, Bourdieu's concept of habitus is useful in encompassing the concept of 'disposition' or 'habit.' Yet, it operates at more than merely an individual level, as it encompasses dispositions and habits as psychosocioculturally mediated. Habitus is the principle, at the individual level, that generates practice, or how people approach day-to-day life, their attitudes and inclinations. At the group level it is also a unifying principle for a whole repertoire of social practices (Csordas 1997b). For instance, the habitus of meditators may be distinctly different from non-meditators, such that they are disposed toward alternative modes of healing and health. This habitus might include attitude, diet, liberal friends, liberal parents, liberal community, belief in and more education about alternative healing and more education about them, and past experience with dissociative techniques (hypnosis, sweat lodges, drug use, etc.), among many other possibilities. This habitus is one potential predisposition toward dissociating to filter stress. Another diathesis could

be genetic—i.e., the result of intrinsic biological variation. A combination of habitus and a body status—suggesting an ongoing synergy—is Bourdieu’s (1977) use of the Greek term *hexis*. Body hexis refers to the ‘active condition’ or state of the body. Health, as an ongoing, maintained, and fluctuating conceptual process, is such a hexis. Stress is another, connoting the active body state concomitant to homeostat activity in response to stressors, as will be discussed in subsequent sections. And, not surprisingly, dissociation is also an active condition, thus, a body hexis.

*Figure 3.1 Dual embodiment schema*



\*Taken from Worthman (1999:52)

Worthman outlines a biocultural model of embodiment to which classical psychobiosociocultural interactions of stress, which shall be discussed in the following sections, all relate. Though discussed in general terms, stress is by nature relative to both individual experience and cultural definition, though this definition is by implication and embodied in cultural members. One such “voodoo death,” unimaginable to most

Americans but in Haiti a literal death because of the psychosocial stress induced by the intense fear of Vodou magic (Cannon 2002). This fear is not merely culturally determined but the result of embodied culture, the roots of which are an historical interaction of physiology and practice, as depicted in Figure 3.1. Worthman outlines five aspects and implications of dual embodiment as follows:

First, individual differences in biobehavioral affective styles of relating to experience (reactivity) create variation in the effects of any given experience...Second, cultural practices influence the timing, type, and frequency of specific experiences...Third, culture merely influences the probability of exposure to a given experience or set of experiences; actual individual experience is conditioned by historical, proximate, and stochastic factors...Fourth, temperament-environment interaction modulates individual phenomenology of even shared experience...Fifth, feed-forward ontogenetic processes shaped by person-environment interactions set up future trajectories of actual and lived experience that further interact with the evolving social niche the individual comes to inhabit through both attainment and ascription. [1999:58-59]

A diathesis-stress dual embodiment model has many implications for public health, as will be clear through review of adaptive forms of dissociation utilized in service of health and well-being. Clinical approaches to ameliorate pathogenesis of stress-related diseases and disorders targets individual symptoms and biology, whereas epidemiologic and public health approaches seek social-situational patterns of risk factors to buffer and remove potentially deleterious conditions. These approaches are synergistic but differ in the level of intervention and political implications. Dual embodiment models in general allow for a more practical biocultural approach that can have practical applications at multiple levels of intervention (Worthman 1999:55). By thus better understanding how a diathesis-stress model dissociation is dually embodied in relation to known population stressors and individual experience, it may be possible to estimate their impact and the capacity of populations to cope with them.

Homeostatic mechanisms mediate the role of dissociation and should more accurately be considered mechanisms of deafferentation to connote this physiological function in stress response. These homeostatic mechanisms are elements of the body hexis of embodied dissociation. Use of terms like body hexis refer to an ongoing process that is influenced by environment whenever discussing dissociation, not a static condition. This active state is hypothetically predisposed but embodied in various ways by virtue of different environmental and personal interactions. Through embodiment, the predisposition of dissociation can manifest in two basic ways, either adaptive or maladaptive, as will be briefly outlined in the following sections.

#### *1.1 ADAPTIVE DISSOCIATION AND PSYCHONEUROIMMUNOLOGY*

The role of stress response is receiving increasing attention in the nascent field of psychoneuroimmunology (and the closely related psychoneuroendocrinology).

Psychoneuroimmunology is “the study of how social and psychological factors affect neuroendocrine and immune functioning” (Koenig 2002:11). The now classic study that first demonstrated the psychological effects on immune response found that immunocellular activity was inhibited during bereavement after losing a loved one (Bartrop, Luckhurst, Lazarus, Kiloh, and Penny 1977; Coe 2002:385). Numerous other types of stress have since been found to effect immunological changes, such as unemployment, divorce, environmental disasters, and even university exams (Coe 2002; Glaser, Kennedy, Lafuse, Bonneau, Speicher, Hillhouse, and Kiecolt-Glaser 1990; Herbert and Cohen 1993; Ironson, Wynings, Schneiderman, Baum, Rodriguez, Greenwood, Benight, Antoni, LaPerriere, Huang, Klimas, and Fletcher 1997; Kang, Coe, McCarthy, Jarjour, Kelly, Rodriguez, and Busse 1997).

Conversely, religious belief and practice has been associated with positive immunological outcomes. Several studies have examined biological mechanisms related to health associated with religious experiences. A study of elderly found that those attending religious services were 49% less likely than those not attending to have high serum interleukin-6 levels, which is indicative of inflammatory reaction to physiological stress. This was only reduced to 42% ( $p < .005$ ) when corrected for age, sex, race, education, chronic illness, and physical functioning (Koenig, George, Cohen, Hays, Larson, and Blazer 1997). Another study found that in 112 women with metastatic breast cancer, the importance of religious or spiritual expression positively correlated with natural killer cell numbers ( $r = 0.19$ ,  $p = 0.02$ ), T-helper cell counts ( $r = 0.16$ ,  $p = 0.05$ ), and total lymphocytes ( $r = 0.15$ ,  $p = 0.05$ ). Natural killer cell activity has been directly associated with metastatic breast cancer as a physiological defense (Schaal, Sephton, Thoreson, Koopman, and Spiegel 1998).

Although the physiological mechanisms have yet to be pinpointed, there is a statistically significant association between the comfort religion provides in dealing with stress, the positive feelings of well-being people effected in some people, and the optimism and hope that it stimulates, and lower rates of depression and anxiety (Autiero 1987; Foley 1988; Patel, Shah, Peterson, and Kimmel 2002). Prayer and other diverting activities of religious practice negatively correlate to pain levels (Geisser, Robinson, and Henson 1994; Swartzman, Gwadry, Shapiro, and Teasell 1994; Swimmer, Robinson, and Geisser 1992). Religious belief and the social support that comes through associating with others of the same belief may improve self-esteem and a feeling of purpose (Hays, Landerman, George, Flint, Koenig, Land, and Blazer 1998; Musick, Koenig, Hays, and

Cohen 1998; Swimmer, Robinson, and Geisser 1992). One study of 720 adults found that religious attendance buffers the effects of psychosocial stress on mental health (Williams, Larson, Buckler, Heckmann, and Pyle 1991), and a study of 107 women with advanced breast cancer found that spirituality (which is not the same as religiosity but is related) seemed to improve emotional well-being (Coward 1991). Additionally, these psychological advantages of religiosity seem to be greater the more religious one is and among fundamentalist religions in relation to more liberal traditions. Other important associations between health and religion regard the greater amount of social support religious persons have available to them, the greater quality of that social support, and the overall longer life expectancy associated with religious life (measured by both frequency of attendance and conservatism of tradition) (Koenig 2002).

These statistics are logical given that religion generally emphasizes the reduction of risk-taking and stress-inducing behaviors and the power of religion is in the devotion and fidelity with which believers comply with religious prescriptions and proscriptions. Secular Israelis have been found to have higher total fat and saturated fat diets than non-secular Israelis (Friedlander, Kark, Kaufmann, and Stein 1985), as well as higher plasma levels of cholesterol, triglyceride, and low-density lipoprotein (Friedlander, Kark, and Stein 1987), which may be related to dietary proscriptions. Religiosity in college students has been found to correlate positively to beneficial health behaviors such as wearing seat belts (Oleckno and Blacconiere 1991) and utilizing preventative health services (Comstock and Partridge 1972). Mormons and Seventh Day Adventists have been found to have lower rates of deleterious health outcomes related to tobacco and alcohol use (Fraser 1999; Grundmann 1992). A study African-American adolescent

females found a positive correlation between religiosity and awareness of the risks of sexual activity and avoidance of unsafe sexual behavior (McCree, Wingood, DiClemente, Davies, and Harrington 2003). Religiosity may also promote health by encouraging the use of personal health practices and services, such as by sponsoring blood pressure screening, blood drives, soup kitchens, and food drives (Heath, Madden, Grant, McLaughlin, Todorov, and Bucholz 1999; Koenig, George, Cohen, Hays, Larson, and Blazer 1998; Stewart 2001; Zaleski and Schiaffino 2000).

In addition, many religious rituals serve explicit healing purposes using a variety of biosocial techniques, which is why health-affecting modalities like meditation have been extrapolated from them. Inferential evidence is accumulating to indicate that the dissociative trance state, often the means to communicate with spirits or deities, confers immunological benefits. Though this contention has been made for many years, it is only more recently that the psychoneuroendocrine pathways of these behaviors have begun to be made clear. Religious trances are invoked by a variety of stressors. These stressors—e.g., repetitious kinesis, auditory driving, psychoactive drugs, and hypoglycemia—may be the mechanisms by which such physiological changes are effected.

Meditation is one of the most studied forms of dissociation vis-à-vis health and can therefore be used to approximate the health benefits of other forms. Though meditation was developed in the context of religious ritual, the aspect determined specific to interaction with stress response—termed *relaxation response* (Benson and Klipper 2000)—has been isolated and implemented in biomedical interventions and clinical research. Studies indicate it reduces risk factors for a host of stress-related health problems (Bairey Merz, Dwyer, Nordstrom, Walton, Salerno, and Schneider 2002;

Walton, Schneider, and Nidich 2004; Walton, Schneider, Salerno, and Nidich 2005) and that practicing meditators have a less reactive stress response than non-meditators (Hoffman, Benson, Arns, Stainbrook, Landsberg, Young, and Gill 1982; Morrell and Hollandsworth 1986).

It has also been postulated that self-deception, another form of dissociation, helps protect people from mental illness (Lane, Merikangas, Schwartz, Huang, and Prusoff 1990; Sackeim and Gur 1979; Sackeim and Wegner 1986). For instance, people frequently portray things about themselves as more positive than reality merits to avoid embarrassment or criticism, to preserve optimism, and to manage impressions.

In the diathesis-stress model of dissociation, adaptive and maladaptive are primarily culturally defined. For instance, over-dissociation is defined as dissociative disorders. Yet these are also caused by unique personal trauma that no other cultural construct may be suited to accommodate. As outlined in the preceding section, adaptive dissociation seems largely to be defined within religious and health contexts. Maladaptive is the opposite, but I also propose a biological type of maladaptive dissociation, as the following section outlines, which is the inability to dissociate when faced with stressors.

### *1.2 MALADAPTIVE DISSOCIATION: OVER- AND UNDER-DISSOCIATION.*

If dissociation constitutes an adaptation spectrum as discussed in chapter 2 (see Figure 2.2), it would include an adaptive mean, as well as maladaptive extremes—over-dissociation, which is well-documented, but also under-dissociation.

Over-dissociation can be adaptive or maladaptive, depending on type and context. Dissociative disorders are sometimes conceived as psychologically adaptive to trauma

victims in part, enabling them to cope with their trauma and continue to live, unless alters harm or threaten to harm. Yet long-term dissociation results in psychological deterioration instead of adaptation. In such cases, individuals may end up in psychiatric facilities and become the sensational fodder of popular culture. This contributes to an unbalanced perception of dissociative disorders and what the typical sufferer is like. In culturally-structured forms like those of shamanism and possession trance, extreme dissociation is structured, finite, and functionally utilized in the service of healing, both expressly and implicitly.

Self-deception, which is generally adaptive, as mentioned in the section above, can also be maladaptive. For instance, extreme denial of a negative state of health can lead to avoidance of treatment, and continuation of risky behavior can result in degradation of well-being and is in such cases maladaptive (Ford 2004). Additionally, where moderate self-deceptive self-enhancement and impression management may be a beneficial coping strategy or merely an emotional buffer, narcissistic self-deception may impair social relationships (Jordan, Spencer, Zanna, Hoshino-Browne, and Correll 2003).

The inability to dissociate, though not currently documented, would hypothetically preclude self-deceit and therefore result in a relative lack of well-being. I speculate that anxiety disorders are to some degree related to a lack of dissociation. The inability to partition stress in one's consciousness may result in mental chaos and feelings of being perpetually overwhelmed, leading to a reclusive social existence or mental breakdown. This hypothesis still requires investigation and testing, but it is not dissimilar from the association between depression and a lack of self-deceit. The ability to not know that one is not as important, smart, beautiful, well-liked, and skilled as one would

like to think actually prevents low self-esteem and promotes well-being. Perhaps the adage “ignorance is bliss” is even reinforced through genetic selection.

## *2. SUMMARY*

This chapter outlined the general models that have informed this study. These include the diathesis-stress model of dissociation, the allostasis model of stress, and the dual embodiment model of biocultural synthesis. Though humans may have a predisposition to dissociate as part of stress response, many environmental and cultural variables can intercede to determine if such dissociation is adaptive or maladaptive for the individual. In addition to culturally relative, normal adaptive, and pathological forms of dissociation, which are all generally accepted, this chapter introduced the potential for maladaptive under-dissociation.

The following chapter introduces stress as another body hexis. As an active body state, stress is difficult to operationalize and measure. The categories of stress measurement are outlined, as it is important to know how stress might be measured to understand the choices made in this study.

#### 4. MEASURING PSYCHOSOCIAL STRESS

The study of stress is important because of its inherence to social existence and impacts on health. But the term “stress” suffers from misuse, as much by stress researchers as by laypersons. It is used to describe the environmental and psychological triggers, as well as the biological responses to those triggers. It is considered as any nonspecific deviation from homeostasis (i.e., equilibrium) by some, meaning that stress can be a positive response to excitement in enervating the body (including the mind), an adaptive fight-or-flight response to perceived danger, or a chronic activation of “stress hormones” because of ongoing turmoil in one’s life. This is the essence of Selye’s classic definition of stress as “the nonspecific response of the body to any demand for change” (1984).

For the purposes of this dissertation and much of the quantitative research involving stress, the biological deviation from homeostasis is termed *stress response*. Environmental triggers of stress response are called *stressors*. *Stress* is the psychobiological process in which stressors are perceived by the mind/body as potentially harmful and activate stress response. This acknowledges the biological perspective, whether or not there is a threat or environmental change external to the corpus. Psychiatrist Herbert Weiner elaborated that “the stressful experience is a potential or actual threat or challenge to the integrity, survival, and reproduction of the organism. The threat or challenge may be anticipated. It may be real, imaginary, or an admixture of both” (1992:33). It also accommodates an evolutionary perspective, which recognizes stress specifically as anything engendering a measurable glucocorticoid response. These “human psychosocial stress responses have evolved to be sensitive to conditions for which adaptive contingencies exists (i.e., conditions to which individuals

benefit from changing their behavior in ways that are influenced by physiological/neurological effects of stress responses...)" (Flinn and England 1997:33-34). And, finally, it envelopes a more proximate health perspective, which focuses predominantly on the negative affects of stress and states that it occurs when "environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease" (Cohen, Kessler, and Gordon 1995:3). What the suggested definition also suggests is that stress is based on perception, and perception can be moderated by both psychological and cultural factors. Pollard suggests that "the most useful and only definitively defensible position when working with humans may be to accept that stress is a culturally constructed and necessarily subjective phenomenon" (1999:232).

The basic conceptual issue with regard to stress research is that, as an imprecisely defined phenomenon, it is difficult to quantify for purposes of analysis. However, it is a robust field, and numerous approaches have been developed, all of which have strengths and weaknesses. One of the primary problems related to stress research is that measurement methods often induce or exacerbate stress in those being studied (Pollard 1999), so the ability to minimize this affect is crucial when considering research design with any of these techniques. They include methods to measure life events, daily hassles, affective response and appraisal, and biomarkers. They pertain to three basic realms of stress assessment: potential environmental stressors, psychological stress appraisal and emotional response, and physiological manifestation of stress response.

The methods used in this study include a measure of stress appraisal and two physiological measures of stress. These were deemed most appropriate for the design of

this study, though any study of stress benefits from approaching the hexis of stress from as many perspectives as possible. The following discussion will provide an overview of the possible approaches so that the choices made in this study can be understood.

### *1. ENVIRONMENTAL STRESSOR MEASUREMENT*

Environmental stressors may be better understood as potential triggers of biological stress response. These potential stressors can include life events, such as divorce or a death in the family; daily hassles, such as an overcrowded subway car or an out-of-service elevator; and chronic or long-term, persistent stressors, such as frustration with having a high educational level and a low-paying menial job or of earning minimal income while trying to raise multiple demanding children. These stressor types can be assessed by somewhat distinct measurement devices but actually produce interdependent effects. Therefore, life events, daily hassles, and chronic stress measures are often used together for maximum accuracy.

#### *1.1 LIFE EVENTS*

Life events are considered important in measuring stress because they can have both immediate and long-term stressful consequences. Historically, the two major areas of assessing potentially stressful experiences are life events and daily hassles. While it may be difficult for researchers to collect self-reports of relative stress, it is possible to collect information on potentially stressful life experiences and estimate the affects of stress response in populations. This is accomplished by comparing associations of the rates of life histories and diseases. This perspective was established in the 1930s when psychiatrist Adolf Meyer advocated physicians fill out a life chart as part of the medical history taken for new patients and was systematized in 1957 with the development of the

Schedule of Recent Experiences (Hawkins, Davies, and Holmes 1957). A modification of the Schedule of Recent Experiences, called the Social Readjustment Rating Scale (Holmes and Rahe 1967), added face validity by using a panel of judges to rate the items. The conception of both scales is based on Selye's assumptions that there is a cumulative affect of stressful life events and that a life change is the defining characteristic of a stressful event (Cohen, Kessler, and Gordon 1995; Turner and Wheaton 1995).

In using a life events checklist in stress research, sociologists R. Jay Turner and Blair Wheaton (1995:32) enumerate several recommendations and caveats, as follows:

1. Events should be distinct and not confounded with other events or types of stress so that each can be compared with the other and over time.
2. Lists should be chosen with respect to the study population and
3. Revised to accommodate cultural and circumstantial variations.
4. Events should focus on negative stressors and exclude clearly positive ones.
5. Events that are direct indicators of mental or physical health should be removed but those that are only causally affected retained.
6. Thirty to 50 items should be used to retain efficiency and predictive power without overburdening subjects.
7. Comprehensiveness should be attained by open-ended follow-up and probing.
8. The number and types of roles a person occupies (e.g., student, parent, teacher) should be examined, as they will be confounded with life events stress but are actually positively associated with social competence and therefore contraindicative of negative stress.

9. A minimum one-year window should be used as the recent events time frame, with longer periods for more severe events and those with verifiable long-term impacts.
10. Information about the time course of events should be gathered.
11. Unweighted indices have proven as explanatory as weighted ones, so are sufficient provided the outcomes and coping strategies of stress are examined in context.
12. Finally, reliability based on test-retest correlations is problematical because of memory inconsistency but can be improved using memory cues, wording to better define event type realm, and a life events calendar to date event onset and offset.

The other primary method of measuring life events is interviews with qualitative probes. Interview techniques are not as useful as other methods in correlational or prospective studies but are helpful in determining the exposure time of a stressor or the onset of illness believed to be associated with stress. Aside from the difficulty in coding interviews, their primary drawback is expense, which is considerable relative to checklists (Wethington, Brown, and Kessler 1995).

### *1.2 DAILY HASSLES*

Measures of daily stress or hassles are useful for seeing a finer-grained picture of stress impact than is possible using life events methods alone. Whereas the latter may suffer from recall bias and therefore limited accuracy, as well as possess a restricted ability to elicit the mechanisms behind chronic stress, daily hassles methods facilitate a finer-grained analysis of the impact and mechanisms of stress (Eckenrode and Bolger 1995).

There are six primary reasons for using daily hassles methods in stress research. They enable researchers to (1) document individual exposure to stressors and (2) analyze the interrelationships of daily events and potential cascade effects of coincidental

negative events. They (3) facilitate the investigation of the mental and physical stress impact on health. (4) The extent to which daily hassles contribute to chronic stress can be assessed. Because major life events can be exacerbated by daily stressors or the opposite, the (5) role of daily hassles in major life events is another area of interest. Finally, (6) the interactions of personality, social structures, and stressors can be studied more precisely (Eckenrode and Bolger 1995).

### *1.3 CHRONIC STRESS*

During the 1980s, interest turned from cumulative life events and acute or daily stressors to the implications of chronic stress, such as those experienced in occupations, marriages, or family conflicts (Cohen, Kessler, and Gordon 1995). Chronic stressors are discrete events that occur over a long period or a constellation of events that are closely sequential and persist over a long time. A reason for the turn in interest toward chronic stress is that it has been easier to link chronic stressors to the incidence of diseases that have a long-term onset, such as CVD, than to limited or episodic stressors. Another reason is that, although body hexis is remarkably adaptive, it does not always habituate to chronic stressors. Chronic stressors may increase vulnerability to acute stressors by undermining biopsychosocial coping resources (Lepore 1995; Sapolsky 1998).

The means of assessing chronic stressors are in many ways the same as those used to assess life events and daily hassles, including self-reports, checklists, interviews, and researcher observation. Because chronic stressors may be major, long term events; smaller but persist ones; or any combination thereof and may be exacerbated by psychological characteristics, it is important to utilize a variety of methods. The problem that often occurs in research of confounding roles of various stressors is largely

attributable to an overreliance on self-report methods questionnaires alone (Lepore 1995).

Thus stressors can be assessed in terms of life events, daily hassles, or chronic conditions. All have advantages and limitations. This study attempted to make use of a life events scale, but life events scales are long and difficult to implement in field research in which numerous other measures are included. One advantage of them is that they include appraisal scales, as will be outlined in the next section, but there are other self-reports that allow this evaluation in a more efficient format.

## *2. PSYCHOLOGICAL STRESSOR MEASUREMENT*

The following sections outline how a person responds to an environmental change—i.e., a stressor. Though psychology is not strictly extricable from the biological stress response, it is important to distinguish because, depending on the circumstances, it can be the psychological evaluation of a stressor that triggers biological stress response or, conversely, the reflexive biological response that initiates an emotional reaction. The following section begins with appraisal, which is important to understand because it can be conflated with dissociation. Appraisal is a conscious evaluation of what environmental events should constitute stressors, whereas dissociation is a non-conscious function of the stress response that inhibits certain neural pathways in favor of others to accomplish the response to stress, either by filter it or facilitating fight-or-flight and efficient return to homeostasis.

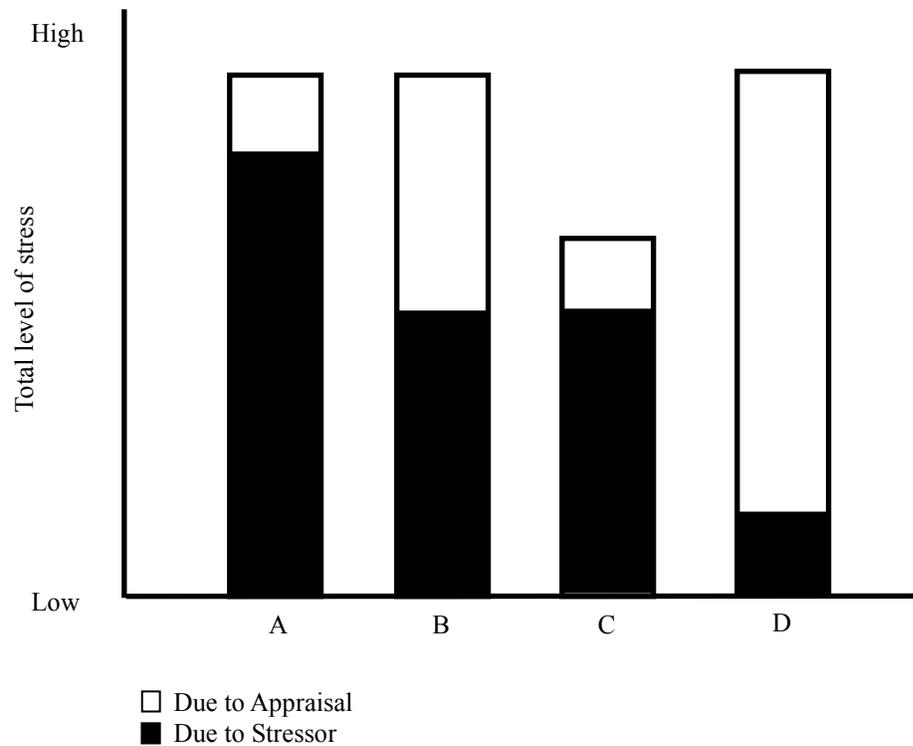
### *2.1 STRESS APPRAISAL*

The main reason to consider appraisal is that environmental adversity can be minimized by appraisal, with healthful benefits, or maximized, with detrimental implications.

Figure 4.1 suggests four hypothetical cases of stress as mediated by appraisal. High

environmental stress minimized by appraisal (A) has the potential to produce a stress load equivalent to a medium environmental stressor with a corresponding appraisal (B) or a low environmental stress load maximized by appraisal (D) (Monroe and Kelley 1995).

*Figure 4.1 Four hypothetical cases in which final total stress level varies as a function of two major components—appraisal and stressor*



\* Taken from Monroe and Kelley (1995:132)

There are two types of multi-item scales to assess appraisal—those designed to measure appraisal in relation to a specific stressor and those that target it in relation to accumulated life stressors. Significant among such scales is the Stress Appraisal Measure (Peacock and Wong 1990), which was developed to measure appraisal in relation to a specific stressor. Another commonly used scale is the Perceived Stress Scale (PSS) (Cohen, Kamarck, and Mermelstein 1983). The PSS measures the perceived stress to general life situations, rather than a specific stressor. It comes as a 14-, 10-, and 4-item

scale. All have been found reliable, valid, and useful across a wide demographic and ethnic spectrum (Monroe and Kelley 1995), though Cohen and Williamson (Cohen and Williamson 1988) recommend the 10-item scale as the superior version.

## *2.2 AFFECTIVE RESPONSE*

Affective response is sometimes measured in relation to stress because it is part of stress response. There is a linear progression beginning with appraisal and coping, followed by affective response, and then physiological and behavioral responses. Measurement of affective response relies on some type of quantifiable outcome. It is implicit in most “well-being” measures, can be considered equivalent with some clinical measures of mood, and can also be considered roughly equivalent to a measure of stressor severity. There are several issues regarding the operationalization of affective response measurement. Two basic structures have been proposed—the specific affects approach and the dimensional approach. The first operates with the assumption that there are many different types of mood with characteristically different response patterns. The dimensional approach conceives affect or mood as comprising just a few core dimensions, beyond which are shades of those basic dimensions, along the lines of color hues (Stone 1995).

The PSS-10 was chosen for this study, as it is a measure of perceived stress in relation to general stressors. No measure of affective response was used. It is important to compare self-reports with an objective measure of stress response. The following section briefly outlines the possible objective measures currently used in the field.

## *3. BIOMARKER MEASUREMENT*

Biomarkers are the physiological correlates of stress response. The sympathetic-adrenal-

medullary (SAM) axis involves sympathetic nervous system (SNS) stimulation of catecholamine release. This is followed by hypothalamic-pituitary-adrenal (HPA) axis stimulation of glucocorticoid release. The frequency and duration of these activations can have long-term consequences to body homeostasis directly, through the body's exposure to these circulating hormones, and indirectly through their impact on related immune responses. These immune responses may be related to the same threat that activated stress response, or they could be a result of a persistent or overactive stress response. The following methods are means of measuring these different aspects of stress physiology, which are invariably used by researchers in conjunction with environmental or psychological assessments of stress.

### *3.1 CARDIOVASCULAR RESPONSE*

Blood pressure and heart rate measures of stress are essentially measurement of SNS or SAM axis activity. Cardiac contraction and vasoconstriction, which both serve to increase heart rate and blood flow/pressure, are mediated by sympathetic innervation and circulating epinephrine (EPI) and norepinephrine (NE). With increased blood pressure, there is a baroreceptor reflex that is a mechanism of the negative feedback to return the system to normal after activation. Therefore, multiple cardiovascular measures (e.g., heart rate and blood pressure) or a measure of cardiovascular activity in conjunction with other measures must be made for an accurate picture of this complex response. This is also true because of the previously discussed specificity of stress response to particular stressors (Krantz and Falconer 1995). Whereas the response in general is nonspecific, as outlined by Cannon (1939) and Selye (1973), cardiovascular responses in particular are actually situationally stereotypic (Engel 1972; Lacey 1967) and thus good indicators of

the active state.

### *3.2 CATECHOLAMINES*

Circulating EPI and NE can be measured in sampled blood, but the half-life is extremely short (Baum and Grunberg 1995). The change in circulating levels can turn over completely in a minute or two, so measurement of this type represents only acute stress. This represents a problem for sampling, as venipuncture for acquiring a sample will stimulate a SNS response and produce elevated EPI and NE levels. Therefore, it is recommended to establish a baseline measure of circulating EPI and NE by sampling approximately 15-20 minutes after venipuncture to use as a comparison. Free (i.e., unmetabolized) EPI and NE can also be measured in urine. While urine measurements are not necessarily accurate representations of the current state of stress in an individual, they are useful in comparison among a sample of individuals or longitudinally in the same individual. And because the bladder fills slowly over time, urine measurements are indicative of a longer, more stable time interval of SNS activity than the blood sample method. Urinary sampling is therefore most useful for study of chronic stress. By comparing interval times to self-reported or observed stressful events, it is possible to assess neuroendocrine response to specific experiences (Baum and Grunberg 1995).

The two primary means of measuring catecholamine levels in collected samples are radioenzymatic assay and high-performance liquid chromatography. Both are well validated and considered reliable. The key differences are the expense of the equipment and number of trained technicians required. Both methods are expensive and unnecessary if the desired use is a simple comparison of stressor and SNS arousal, but they are useful when research is focused on understanding the mechanisms of stress

interaction with other bodily systems and are more sensitive than blood pressure methods. When used, certain controls are necessary because of catecholamine sensitivity to movement, drug (including alcohol and tobacco) use, and consumption of caffeine and many common foods (Baum and Grunberg 1995).

It takes approximately an hour for NE to move from blood to saliva after release, so it is not possible to get an accurate measure of NE directly through saliva (Kennedy, Dillon, Mills, and Ziegler 2001). Additionally, the methodological restrictions of NE analysis include immediate sample processing freezing and render field studies next to impossible (Rohleder, Nater, Wolf, Ehlert, and Kirschbaum 2004). Recently, however, an indirect method has been developed for assessing catecholamine levels through saliva (Granger, Kivlighan, el Sheikh, Gordis, and Stroud 2007). The enzyme  $\alpha$ -amylase has previously been of interest to researchers because of its role in digestion (Lieberman, Gahagan, Yalich, and Walden 1977), but it is now recognized as a proxy of catecholamine activity and thereby a means of assessing SNS activity in response to psychosocial stress. This is based on the hypothesis that the autonomic nervous system innervates salivary glands (Rohleder, Nater, Wolf, Ehlert, and Kirschbaum 2004). The SNS increases secretion of salivary proteins, including  $\alpha$ -amylase (Garrett 1999), while the peripheral nervous system increases salivary flow rate (Baum 1993). Acute experimental stressors have been found to induce  $\alpha$ -amylase secretion (e.g., Nater, La Marca, Florin, Moses, Langhans, Koller, and Ehlert 2006; Nater, Rohleder, Gaab, Berger, Jud, Kirschbaum, and Ehlert 2005; Takai, Yamaguchi, Aragaki, Eto, Uchihashi, and Nishikawa 2007; Yamaguchi and Sakakima 2007), though chronic stress appears to be associated with reduced output (Wolf, Nicholls, and Chen 2008). Additionally, SNS activity is non-

specific and appears largely to be activated by effort, rather than positive or negative affect (Chatterton, Vogelsong, Lu, Ellman, and Hudgens 1996; Lovallo and Thomas 2000). Important with regard to sampling via saliva,  $\alpha$ -amylase is independent of salivary flow rate (Rohleder, Wolf, Maldonado, and Kirschbaum 2006) and exhibits an endogenous diurnal rhythm (Nater, Rohleder, Schlotz, Ehlert, and Kirschbaum 2007). It is relatively stable in saliva at room temperature for at least two weeks (DeCaro 2008), which is an important consideration for field research. However, the reliability of  $\alpha$ -amylase as a catecholamine indicator has been questioned by some (Nater, La Marca, Florin, Moses, Langhans, Koller, and Ehlert 2006; Nater and Rohleder 2009), and in vitro studies have found release may also be triggered by parasympathetic activation (Busch, Sterin-Borda, and Borda 2006). Hence, it may be most useful as a general autonomic biomarker in complement to measures of cardiac activity or other measures of catecholamines (DeCaro 2008).

Another enzyme kinetic method, though as yet relatively untested, is an automated hand held analyzer for sAA measured using test strips of absorbent paper. Both the test strips and analyzer were fabricated by the authors and require further improvement but show promise, especially for field research (Yamaguchi, Deguchi, Wakasugi, Ono, Takai, Higashi, and Mizuno 2006). Enzyme-linked immunosorbent assays (ELISAs, also called enzyme immunoassays or EIAs) and radioimmunoassays (RIAs) have also been used for sAA analysis, though not in recent studies. This may be because of the greater expense and time involved in utilizing ELISA as compared to enzyme-kinetic techniques (Rohleder and Nater 2009).

### 3.3 *GLUCOCORTICOIDS*

When corticosteroid measures are used to procure an approximate assessment of stress, it is important to control for the circadian diurnal rhythms they exhibit. Cortisol, the glucocorticoid in humans, is released in adults in approximately 15 bursts over the course of a day, with the largest early in the morning (Baum and Grunberg 1995). This pattern maps onto the circadian rhythms of most animals (Gorman and Lee 2002) but may also be due to a programmed association with eating patterns, as one of the roles of glucocorticoids is maintenance of glucose production and facilitation of fat metabolism. Baseline measures of glucocorticoid patterns are therefore necessary for comparison to samples related to stressful events (Baum and Grunberg 1995).

Compared to the SAM axis, HPA axis activation is slower. The half-life of cortisol is about 70 minutes. Because of this delay, venipuncture sampling of blood does not require the time delay of catecholamines to establish a baseline, but a delay is required to sample the affects of acute stress. Urinary sampling, on the other hand, is roughly similar for corticosteroids as for catecholamines, save for consideration of the circadian pattern of glucocorticoids (Baum and Grunberg 1995).

The sampling method most commonly used in anthropological research, because of its relative convenience in field settings, is through saliva. Saliva samples are non-invasive, relatively easy to collect and do not compound the measure of stress by inducing it, as with venipuncture (Ellison 1988; Kirschbaum and Hellhammer 2007). It also provides a more accurate and time-sensitive assessment method than urine collection (Baum and Grunberg 1995). Cortisol remains stable in saliva at room temperature for at least four weeks (Kirschbaum and Hellhammer 2007), another important consideration in field research. There is a high correlation of 0.9 between salivary and blood methods

(Kirschbaum and Hellhammer 1989), as well as a strong temporal relationship. Salivary cortisol is a reliable though indirect measure —because of partial disconnect from cortisol in blood and urine as well as other HPA-related endocrine signals—of HPA activity (Hellhammer, Wnst, and Kudielka 2009). Like catecholamines, cortisol is also sensitive to drug, alcohol, tobacco, and caffeine use; certain foods; and the desired variables in stress research, physical and psychological stressors. Unlike catecholamines, glucocorticoids are relatively insensitive to movement or effort, though they may in fact be more sensitive to negative affect (Lovallo and Thomas 2000), and their onset latency enables researchers a bigger window around a stressor for collection.

Glucocorticoid levels in the past were usually measured by RIA techniques, which are relatively easy to use, highly reliable, and extensively validated (Baum and Grunberg 1995). However, the equipment for RIA is expensive and involves the handling of radioactive substances. A lower cost assay method that is now more common is ELISA , wherein an antigen-antibody reaction is measured using colorometric signals instead of a radioactive one (Lequin 2005). In general for ELISA, antibody is washed over an antigen affixed to a surface. An enzyme is added to affix to any unbound antibodies, then any unaffixed material is washed away. An enzymatic substrate is added to convert the bound enzyme to a detectable signal. The amount of detectable signal is measured and used to determine the amount of antibody-antigen reactions (i.e., the inverse of detectable signal) (Schuurs and van Weemen 1980).

### *3.4 IMMUNOLOGICAL MARKERS*

Psychoneuroimmunological studies have examined the impacts of psychological stress on immune function. For instance, marital dysfunction is considered among the most

stressful life events and associated with reduced immune function (Kiecolt-Glaser, Fisher, Ogrocki, Stout, Speicher, and Glaser 1987). The PERI-LES (Dohrenwend, Krasnoff, Askenasy, and Dohrenwend 1978) has been used to assess environmental stressors and assayed multiplications of two mitogens, concanavalin A and phytohemagglutinin, and Epstein-Barr virus (EBV) antibodies to assess immune response. EBV is the infectious agent for mononucleosis. Measurement of these factors in bereaved individuals and medical students on exam days have revealed lower proliferative responses of the lymphocytes involved in immune response relative to lower-stress baseline days. Measures of EBV antibody provide an indirect measure of immune response because when general lymphocyte proliferation is suppressed by stress, there is an increase in overall viral load, including EBV, and thus a EBV antibody response (Glaser and Gottlieb-Stematsky 1982; Glaser, Kiecolt-Glaser, Speicher, and Holliday 1985; Schleifer, Keller, Camerino, Thornton, and Stein 1983; Schleifer, Keller, Meyerson, Raskin, Davis, and Stein 1984). EBV antibodies are not affected by suppressed immunity like lymphocytes and proliferate to contend with mononucleosis virus. Presence of these antibodies is thus a signifier of overall lymphocyte immune suppression and, correlated with the life events scale, suggestive of the impairing effect of stress (Kiecolt-Glaser, Fisher, Ogrocki, Stout, Speicher, and Glaser 1987).

Objective measures of stress most appropriate to the current study were those least invasive and that could be self-administered. These included measures of salivary cortisol and  $\alpha$ -Amylase. These are advantageous in field research because of this capacity for self-collection, but this also introduces the uncertainty of relying on untrained participants to comply with collection protocols. Future research may attempt

to take advantage of innovations in collection methods with regard to other objective measures that were not validated at the time of this study to control for such uncertainty.

#### *4. SUMMARY*

This chapter discussed psychosocial stress, since dissociation is inextricably linked to it. It reviewed methods to measure environmental stressor, psychological stress appraisal, and stress biomarkers. Many studies have examined the role of stress in human health and developed a variety of means to measure it. Some of these methods were reviewed with the objective of clarifying the rationale for the choices made in this study. This study utilized appraisal and biomarker methods. An environmental method was utilized during initial data collection but proved burdensome on participants and was dropped.

The following chapter will introduce the population to which these methods were applied. It will provide a brief history of Pentecostalism and the specific type practiced by participants in this study, contextualize glossolalia in the dissociation continuum, and introduce a vignette that had an important impact on the study's research design.

## 5. QUALITATIVE RESEARCH

Glossolalia was introduced in chapter 2 as a form of dissociation, and the preceding chapter discussed the diathesis-stress and embodiment models used to assess dissociation in terms of stress. This chapter provides a brief history of Pentecostalism and the Apostolic variety examined in this study. This is important to understand how participants view their own practices. They do not see it in terms of dissociation. Dissociation is only a small element of their praxis. Some of them see Pentecostalism in terms of the movement, particularly the elders who know some of this history, while others only view it in very personal terms. In either case, some of the basics of the history of Pentecostalism are known to them all, whereas many have never heard the term “dissociation” used outside this study.

The following section briefly outlines this history, followed by background information on the specific denomination chosen for this study and why they are appropriate. Details are provided as to the specific sites involved in the study and of their history. Finally, the chapter provides a vignette from field notes of a service wherein an individual was accused of having the “wrong Holy Ghost.” This incident was important in transforming my perception of glossolalia as actually practiced and led to the development of a more nuanced research design and method of measuring glossolalia.

### *1. BRIEF HISTORY OF PENTECOSTALISM*

Most attribute the beginning of the Pentecostal movement to the work of Charles Parham in Topeka, Kansas in 1901 and a subsequent revival in Los Angeles out of the Azusa Street Mission in 1906, though other personalities and events in England, India, and America (Anderson 2004a) also culminated in these seminal periods. Parham was a

charismatic minister of the Holiness movement who began a congregation in Topeka with other Holiness adherents and their families. He decided the conversion experience his followers had been calling the 'baptism of the Spirit' was actually mere sanctification and that their mission was to discover the true baptism. Instructing them to focus on the second chapter of Acts in the bible, he informed them that the gifts of the Holy Spirit should be manifested in a divine experience. Soon after, the connection was made between his instructions and the references to tongue-speaking in the book of Acts, which thereafter began occurring in congregants. Parham launched a campaign to spread his new movement, but it flopped and resulted in the dissolution of the congregation. Later, he found success in Houston, Texas, where he opened a Bible school that would attract a student who would expose Pentecostalism to an international audience (Anderson 1979).

This student, a black Baptist preacher with Holiness leanings named William Seymour, would convince Parham to bless his passage to Los Angeles to become associate pastor of a Nazarene mission there. In LA, Seymour began preaching baptism by the Holy Spirit and tongue-speaking in a former Methodist church on Azusa Street (Nichol 1971). This began the Azusa Street Mission revival, which would take place over a number of years. During the revival "speaking in tongues was regarded as a sign of Baptism in the Spirit for the individual, a sign of a Second Pentecost for the Church, and a sign of the imminent Second Coming of Christ" (Anderson 1979:68). Attendees of the Azusa Street Mission revival returned home throughout the United States and at least 20 other nations to spread the gospel (Anderson 1979).

Pentecostalism flourished, especially after World War II, becoming the largest Christian movement of the 20<sup>th</sup> century (Cleary 1997; Goodman 1988; Synan 1997,

2004). In the 1960s, gifts of the Spirit, glossolalia most prominent among them, broke out of Pentecostalism as part of the Neopentecostal or Charismatic Revival Movement. Churches of many denominations now consider themselves charismatic, and charisms are not infrequent in non-charismatic churches. Pentecostals, Charismatics, and Neocharismatics combined comprise the world's second-largest Christian group after Catholics and the largest Christian movement of the 20<sup>th</sup> century with 570,806,000 as of mid-2004 (Barrett and Johnson 2004).

Besides its emphasis on glossolalia and other gifts as direct access to God, Pentecostalism's success has been attributed to its framework for recovery from illness and restoring health (Chesnut 1997), cultural flexibility (Anderson 2005; Martin 2001), and ability to mold to preexisting belief systems, capacity to empower victims of oppression and modernization (Martin 2001; Stoll 1990). Its global spread across many diverse cultures has been attributed to an adaptive "Pentecostal complex" (Csordas 1980). For instance, in Latin America, Pentecostalism rechannels the "mystical unity with the divine, and miraculous healing," which, until recently, had been thought provinces of folk Catholicism (Stoll 1990:112-113). In Haiti, Pentecostalism represents an innovation within vodou rather than a move away from it (Conway 1980).

In achieving this global success and adapting to local belief systems, Pentecostalism has changed and morphed in many different ways. What unites all forms is the belief in personally experiencing God through charismata. Since the emphasis on the various gifts differs among denominations and cultures, it was important to find congregations that emphasized glossolalia. Apostolics consider themselves original or traditional Pentecostals in their social conservatism, fundamentalist emphasis on the

bible, and belief in the preeminence of divine tongues as the most important gift. The following section provides a brief overview of Apostolics.

### *1.2 APOSTOLIC/ONENESS PENTECOSTALISM*

After Azusa Street, Pentecostalism rapidly splintered into numerous factions. Apostolics consider themselves “true Pentecostals” (Synan 2004), fundamentalists who trace their roots directly to Topeka, Kansas or Azusa Street and the anti-intellectual, conservative roots of the original Holiness faction. They believe the Holy Trinity are conceptualizations of the same being. This distinction from Trinitarians (Pentecostal and otherwise) began when in 1914 Frank Ewart and others began preaching that those not baptized in the Name of Jesus alone were not practicing the primitive Christianity that Pentecostalism sought to revive (Fudge 2003). A split erupted when the Assemblies of God, today the largest Pentecostal organization and fourth largest Christian organization in the world (Blumhofer 1993), adopted the Statement of Fundamental Truths at their Fourth General Council in October 1916, which affirmed their belief in the orthodoxy of the Holy Trinity. This led to a schism in which approximately a quarter of the Assemblies of God ministers, those who believed instead in the ‘oneness’ of the Godhead and in baptism in Jesus’ Name only, separated to form the Apostolic, Oneness, or Jesus Only movement (Fudge 2003).

Historical accounts of Pentecostalism indicate that Christians have a long history with glossolalia and merit dissociation research. It was only after beginning to survey churches that it became apparent Apostolic churches would best suit the testing of the current study hypothesis. The following section outlines that preliminary research.

## *2. PRELIMINARY RESEARCH*

Preliminary qualitative research was conducted from September 2006 through January 2008. A survey was mailed to every (n=56) mid-Hudson Valley Pentecostal or Charismatic church in the Yellow Pages to ascertain membership size, contact person, and openness to further inquiry. The objective was to find medium-sized (100-200 members) churches of various ethnic backgrounds wherein members frequently exhibited glossolalia. Medium-sized churches would have enough members that obtaining a sufficient sample for quantitative research should not be a problem but not so many that it would be difficult to become familiar with many congregants in a short period of time. Therefore, criteria for eliminating churches from this initial sample were too small, too large, and those that were not strictly Pentecostal (e.g., Charismatic or non-denominational). Twelve churches responded to the survey (response rate 21%) with membership sizes ranging from 15-650. Only one church reported a medium-sized membership, but it was non-denominational and geographically distant from the rest of the churches surveyed.

In January 2007, I began visiting churches that did not reply to the survey, sampling them by town. Due to time limitations, not all churches could be sampled, so the non-random method used was to find three medium-sized churches that featured glossolalia, and were similar in all other dimensions save ethnicity. Initial qualitative investigation included discerning the affect of ethnicity on practice, a goal that was later excluded due to time limitations. Non-Pentecostal charismatic churches were quickly eliminated from sampling because of the inconsistent emphasis on glossolalia, such that none was observed in the churches attended nor did it frequently occur according to an Episcopalian pastor of one such church. Nine churches were visited or contacted more

directly during this period. Three Pentecostal churches were ultimately selected for qualitative observation based on ethnic factors. Churches not included varied in characteristics from relatively liberal non-denominational charismatic churches with ethnically diverse memberships to doctrinally conservative Assemblies of God with predominantly African-American members. No known bias in SES or ethnicity characterized the excluded churches. Written permission was obtained from each of the selected church's elders, and all protocol was approved by the University at Albany Institutional Review Board.

After attending services at each of the three churches 2-3 more times each, it became apparent that the Latino church did not feature glossolalia as prominently as it first seemed and that the other two churches were Apostolic, while it was not. Therefore, investigation was refocused on Apostolic Pentecostalism, and the Latino church was dropped from the study. During the qualitative portion of the study, I attended over 50 services at seven different churches, including Sunday midday and evening services, weekday prayer and bible study meetings, youth meetings, choir tryouts, gospel concerts, baptisms, christenings, and fellowship meals. Nineteen recorded semi-structured and countless unstructured interviews were conducted to gather background information and data for the development of a questionnaire for measuring culturally relevant parameters of glossolalia experiences.

Interviews were conducted with anyone attending more than one service, which constitutes "adherence," a degree of membership. For instance, some churches categorize their congregation by number of "adherents" and a subset as "members." The degree of membership for this study was categorized using a power hierarchy, with some

modification, developed by anthropologist Melvin Williams (1984[1974]). This membership model organizes congregants by their access to or influence on the pastor. It includes *elite*, *core*, *supportive*, and *marginal* members as outlined in Table 5.1.

*Table 5.1 Informal organization of study churches*

Category	Constituents
Pastor	
elite members	church elders, pastor's immediate adult family members
core members	other church officers (evangelists, missionaries, ushers, teachers, cooks, housekeeping, musicians), attendees of multiple services per week, choir members
supportive members	"Sunday Christians," ad hoc committee members
marginal members	unstable members (e.g., chronic backsliders, newcomers, visiting relatives), children, mentally/physically disabled

\*Adapted from Williams (1984[1974]:35)

The roles in the church are called "ministries" and include, among others, pastoral ministries, outreach ministries, teaching ministries, and gospel ministries. The pastor considers his ministry just one of many and not more or less important than any other. Nonetheless, his is the face and primary voice of the church and in all churches served as my gateway informant. In Williams' structure the pastor also resides at the top. The elite category comprises individuals whose "policies, attitudes, and decisions directly influence the pastor's behavior" (Williams 1984[1974]:33). In the current study, this is not clearly defined but generally includes the adults of the pastor's immediate family who are members of the church, including wife and brothers- and sisters-in-law. "They can directly influence church policies concerning spending, fund raising, sermons, and allotment of space for ministers to preach and missionaries to teach" (Williams 1984[1974]:33). In the current study, the "elders" are a subset of the elite category. Below elites are core members. Core members are the other officers of the church and critically concerned about the operations of the church, for their future ambitions and

day-to-day life perspectives depend on these operations. But the core members do not have the power or the influence of the elite. They pay their tithes and all other financial commitments asked of them by the pastor and participate in all the activities of the church. They attend [all services throughout the week], and accompany the church on its travel itineraries. They are the members who respond when people are needed to cook, clean, and perform other functions related to annual state meetings and festivities in which the church building is used. They plan and attend special functions such as teas, banquets, pageants, and dinners. Thus, the core members are vital to the church operations, and herein lies their power, especially when they have strong alliances among themselves and with certain elite members... The core and elite members are those most concerned about recruiting and retaining members and about the threat of the church's demise. [Williams 1984(1974):33-34]

Supportive members come primarily to Sunday midday services and special events.

They seldom participate in the planning or policy decisions for these events. They are valued for their weekly offerings, recruitment to ad hoc committees, presence in Sunday morning services, their names that expand the membership list, noninterference in power maneuvers, and contributions to major financial rallies. They are the members whom the core and elite members are constantly encouraging to participate more; they give meaning to the comparative categories of core and elite. They are often referred to as "Sunday-morning Christians" and "fair-weather saints." [Williams 1984(1974):34]

Finally, marginal members are those individuals whose presence is consistent but whose contributions to the church community are minimal, including children, chronic "backsliders" (those who slide back into sin after receiving the Holy Ghost), and others whose "physical, mental, and financial inadequacies are such that their participation... is limited, but whose presence serves to demonstrate the range of acceptance..." (Williams 1984[1974]:36).

The structure of these interviews was focused on eliciting the habitus of congregants in services and during outside activities. Following Csordas's (1997b:72-73) recommendations for comparative study of religious healing, data was collected with respect to (1) "the *disposition* of supplicants" with regard to attitude or engagement in ritual behavior and their disposition toward religious community networks and resources;

(2) “the *experience of the sacred*” in order to determine how much divine healing a person is empowered to invoke through religiously legitimized modes; (3) “the *elaboration of alternatives*” that a person has available in the religio-cultural repertoire in terms of salient metaphors (e.g., “new pathways, becoming unstuck, overcoming obstacles, getting out of trouble, expelling demons, healing emotional wounds”); and (4) “the *actualization of change*” or what counts as change and the degree at which it is regarded as significant in emic terms.

Upon narrowing the study down to these two churches and developing a strategy for qualitative investigation, I began learning more about the churches and their members. While the two churches are similar in terms of doctrinal belief, size, geographic location, and SES, there are differences in terms of ethnicity. According to members, this difference does not influence Apostolic doctrine, but it is unclear if this is altogether true. The following sections outline the basic history and background of the two churches remaining in the study.

## *2.1 CHURCHES IN THE STUDY*

### *2.1.1 Triumphant Apostolic Church of Jesus Christ, Inc. (TAC).*

TAC is an Apostolic church in Poughkeepsie, NY with an ethnic composition that is predominantly Jamaican. It is on a street characterized by low-level drug trade and prostitution. Traditional or fundamentalist Pentecostalism historically appealed to lower socioeconomic strata because it provides much needed structure and resource access and facilitates social mobility (Chesnut 1997; Cleary 1997; Stoll 1990). TAC is a splinter from another Caribbean apostolic church in town, the Church of Jesus Christ Apostolic, Inc. The elite of TAC consists of the pastor, his wife, a brother (the deacon) and his wife,

two other brothers (along with the deacon, comprising the music ministry), and their mother (the church mother), as well as the assistant pastor's family, who moved to the area after the split. TAC has the stereotypical temperament of a black gospel church, with a robust and talented music ministry that is traditional but also very stylistically Jamaican (e.g., there is a significant reggae component to the rhythms). Having observed them over time and in comparing them to my observations of congregations with less compelling musical components, I suspect that their talent may be related to the quick growth the church has experienced.

TAC aligned under an Apostolic diocese in Toronto, Canada. The Toronto diocese church and bishop are also primarily Caribbean. According to the TAC pastor, "Third World churches" such as their home church in Jamaica cannot set up a not-for-profit organization in North America. Therefore, they sought a church established in North America that nevertheless had the Caribbean flavor they missed.

Over 80% of the TAC congregation is from the Manchester parish of Jamaica. Ninety-nine percent are black, from a variety of places, including the United States, countries of Africa, and other Caribbean islands. Jamaicans have been immigrating into the mid-Hudson Valley area for a few generations to escape what informants and the literature describe as a harsh life in Jamaica (Foner 1987). When asked why they chose to immigrate to the Hudson Valley, all informants report coming because of relatives already in the area but cannot answer who originally precipitated this Jamaican settlement. This influx likely began in the last few decades. When Jamaica became independent in 1962, immigration to Great Britain became severely restricted; but in 1965, the quota system in the United States was eliminated, paving the way for a switch

in emigration patterns from Jamaica. After independence, its trade patronage also shifted to the United States, and, in 1972, Jamaican political changes resulted in decades-long economic decline. These factors have led to massive immigration of Jamaicans into the United States, establishing major British-Caribbean communities in most major North American cities, including, significant to this study, New York and Toronto (Foner 1987; Kasinitz 1992). In the 1960s and 1970s, Poughkeepsie, NY was the home of IBM's main plant, producing growth and opportunities for many, including immigrant laborers. In 2000 there were 2,270 self-reported Jamaicans in this town of 72,614 total residents (3% of town population) (U.S. Census Bureau 2000). Additionally, the area is close to the Caribbean communities of New York City, where many immigrants arrive first. A plethora of farms and orchards also afford numerous seasonal jobs for migrant Jamaican workers. According to sociologist Nancy Foner (1987:205), this is typical of the Caribbean immigrant experience. "If faced with a serious problem or crisis," she says, "almost all said they would call on other Jamaicans in New York, usually relatives but sometimes in-laws and friends. The majority of regular churchgoers worshiped in congregations composed predominantly of other Jamaicans and West Indians."

Jamaica has a prominent Pentecostal movement. It arrived in Jamaica in 1907, by 1943 constituted 4% of Jamaicans, 13% by 1960, and 20% by 1970 (Martin 1990). By the 1980s, almost half a million of a population of around 2.3 million Jamaicans reported being Pentecostal (Austin-Broos 1997:21). It is the primary rival to Rastafarianism as the national religion (Austin-Broos 1997; Martin 1990). Sociologist David Martin attributes the reason for the expansion of Pentecostalism in Jamaica to

its capacity to combine a 'New Man' with an ancient strain of spirit possession and healing. It is at once the most recent expression Christianity, and in touch with the

therapeutic cults embedded in a world-wide 'archaic' religiosity. Furthermore it is colour-blind and encourages local leadership and participation...Pentecostalism takes up a deeply ingrained Jamaican faith in the ability of the Spirit to seize each and every one. [Martin 1990:122]

Furthermore, anthropologist William Wedenoja suggests that Pentecostalism has facilitated the creation of a unified national culture through psychic mutation (Wedenoja 1978), a position consistent with the habitus and psychobiological transcendence imputed to dissociation and discussed further in subsequent chapters. Austin-Broos sees this popularity of Pentecostalism in Jamaica as emblematic of the sea-change in influence in Jamaica, where once it was Britain that held influence, it is now the United States (1997).

Pentecostalism flourished most in Jamaica during a period that was also marked by some of the country's most significant sociopolitical change, as it transitioned from agrarian peasant to industrializing state (Wedenoja 1980), a phenomenon that speaks to the stabilizing influence of Pentecostalism. Pentecostalism, particularly conservative forms, emphasize an anti-intellectualism and agrarian piety that is short of asceticism but does so in the context of intellectual and industrial modernization. It is this contradiction that led many first generation Pentecostalism scholars (cf. D'Epinay 1969; Willems 1967) to assert that the success of Pentecostalism is an expression of anomie toward modernization, a position that has largely been revised in favor a more nuanced formulation. Anthropologist David Stoll points out instead how Pentecostalism provides power in the face of political oppression (1990), and Martin avoids the term "anomie" but refers to the empowerment and security Pentecostalism provides those who have fallen through the cracks of modernization (Martin 1990). Samarin points out, however, lest Pentecostalism be oversimplified as exclusively the religion of the poor, that the Neopentecostal movement and more liberal traditions are populated largely by the middle

and upper socioeconomic classes and that Pentecostalism is, rather, a true global phenomenon with a variety of explanations as to its success (1972).

In Jamaica, however, like many regions of Central and South America and the Caribbean, conservative forms of Pentecostalism thrive in the face of socioeconomic turmoil and poverty and is marked by pious practices governing behavior and attire (Wedenoja 1980). Furthermore, Wedenoja points out, while the rise of Pentecostalism in Jamaica may be a sign of the Americanization of the country, a distinct Jamaicanization of the religion has taken place, with the larger missionary effort coming from repatriated Jamaicans rather than Americans (1980:35). In Jamaica, and relevant as well to TAC,

Pentecostalism encourages the development of psychological traits and patterns of behavior conducive to success in a capitalist economy, including deferral of gratification, thrift and conscientious labor and exchange. Self-denial is a virtue in Pentecostalism, which condemns popular entertainment, fashionable clothes, jewelry and other forms of conspicuous consumption. Self-discipline is enforced by a stringent moral code which prohibits such behaviors as promiscuity, illegitimacy, concubinage, drunkenness, violence and religious “backsliding.” Achievement motivation is nurtured by competition for election to church offices and even, perhaps, in striving to achieve “spiritual baptism” by the Holy Ghost. [Wedenoja 1980:40-41]

This background on the history of TAC and Jamaican Pentecostalism helps portray the habitus of Apostolic practice among members at TAC. Abundant Life Tabernacle, the other church in the study, does not have a consistent ethnic composition, though there are several elite and core Jamaican members. The following section briefly backgrounds ALT.

*Abundant Life Tabernacle (ALT).*

ALT is run by a Nigerian pastor with a Jamaican assistant pastor. Ethnic backgrounds represented among members are white American, African-American, Caribbean, hispanic, and Indian. The church was originally aligned with the United Pentecostal

Churches International (UPCI) but broke away a few years ago over liturgical differences, feeling UPCI was too doctrinally liberal. Raised Catholic, ALT's pastor traveled to Greece for training in civil engineering, where he learned to speak fluent Greek in a relatively short time. He refers to himself as "crazy" during his early years and searched for a religion that would calm and satisfy him. He practiced Buddhism and traveled to South Asia on a pilgrimage and later turned to Krishnaism. But it was not until he was introduced to Apostolic Pentecostalism back in Greece that he found what he was seeking. Along with his wife and five sons, he has developed ALT over eight years into a church with a far reach.

The ALT pastor asserts that he does not know why people come to his church but that when he was living in Massachusetts he answered "a calling"—in this case, a literal voice he heard that he attributes to God—that told him to go to Kingston, NY to start a church. He says that over the years hundreds of people from the surrounding area and beyond—even Seattle, Florida, and London—have heard of their church and come to visit. When asked about healing acts, he mentions in an offhand manner that he has seen people with many supposedly incurable ailments and disorders—both mental and physical—become symptom-free through worship in their church.

Because of the large number of attendees, they offer two Sunday services, one in the morning and another in the evening. And they also run another church in Port Jervis, an hour away, which part of the elite and core members drive to and from between the Sunday services in Kingston every week. The pastor also oversees several churches in Greece and one in London, which have been started by friends who requested he take on the role of assisting them.

Like TAC, ALT focuses on glossolalia as the primary signifier of acceptance of Christ. Through the course of this investigation, they became the secondary source for information and informants. Both churches are medium-sized, but, at around 100 members each, both are at the lower range of medium. Because TAC is more ethnically homogenous, they were chosen as the primary congregation. The following section outlines one informant indication of difference between the churches that contributed to this decision.

### *2.1.3 Comparing the two churches.*

Despite the relative close proximity, there is little communication between the churches in this study. A few elite and core members of ALT have infrequently attended TAC—and one ALT supportive member periodically toggles back and forth—but TAC's congregation are almost completely unaware of ALT's congregation, save a few elite members, and have never attended ALT. One of ALT's core elite families actually lives closer to TAC than ALT and, though they are white, were previously long-standing members of a largely African-American church in Yonkers. They said they preferred ALT because they are not Jamaican and did not feeling comfortable adjusting to such Jamaican Pentecostal traditions as head coverings for women, a cultural tradition these individuals felt TAC was erroneously pushing on people as an Apostolic tradition. While the temperaments of the congregations differ somewhat,<sup>9</sup> they are generally in agreement on matters of interpretation, at least with regard to the focuses of this study.

Through the course of this preliminary investigation, it became difficult to conduct in-depth investigation of two separate congregations. In future research, I would prefer to utilize a teach approach, with an individual investigator assigned to each church

with only periodic site visits to other churches. Yet, utilizing two churches was integral to discerning what was Apostolic habitus and what was particular to a specific church or ethnicity. For instance, the following vignette outlines an incident that was integral to the development of the quantitative research design, including a glossolalia typology. But I asked questions at both churches to distinguish what elements of the incident related to personal opinions of the agents involved and what related to Apostolic habitus. This incident, termed “the wrong Holy Ghost,” suggested that not all forms of glossolalia are acceptable and are tied to variations in individual habitus that had to be taken into account in measuring stress. To preserve confidentiality, I do not indicate at which church this incident took place.

## 2.2 “*THE WRONG HOLY GHOST*”

This incident involved a married couple attending a Sunday midday service, who will be referred to as “Richie” and “Amanda.”

Richie and Amanda are in their mid—thirties. Richie attends this church sporadically, as his sister and her children are members. Though he initially preferred this church, his wife attended a different Pentecostal church that he now claims as his own too. I noticed him initially because he wore flashy suits and his hair in cornrows. I had not previously observed him speaking in tongues, but he claims to have received the Holy Ghost years ago in Jamaica.

As is generally the case, as service proceeds and the Spirit moves them the brethren were in the aisles and running around the congregation in their ecstasy. The church had recently inaugurated their excellent gospel choir, and it appeared their performance had electrified the congregation. As usual, when the song ended the

congregation continued clapping, maintaining the rhythm, and singers on the stage continued to repeat the chorus. This prompted the band to resume playing, though merely repeating the chorus, creating a strong atmosphere of trance force. This occasioned the most glossolalia I have seen take place at one time.

At the center Richie started jerking in a sharp forward-backward motion in his chair. Amanda's son was to his left, a boy probably around four years old. It looked like he might get hurt because Richie's hands were jutting spastically to the side and down and looked as though they would hit him. Amanda, also fashionably dressed with stylish glasses but without the hat or hose/leg covering many Jamaican Apostolic women wear to church, was on Richie's other side and got up and reached across her husband to remove the boy to the pews on the other side of the church. Richie's sagittal movements caused his chair to tip so that others moved in to catch him. A deacon supported him while other elders came close and watched carefully. Richie had his eyes closed, and his utterances were the same few sounds—not even complete 'words' (or, as is the case with glossolalia, utterances interpreted as otherworldly language)—repeated over and over. His body convulsed with the vocalizations like a phonograph arm on a skipping record. His wife went into tongues and moved to stand over him and put her hand on his chest. Meanwhile two glossolalic choir girls were walking repeatedly around the whole congregation, holding hands and leaning over with eyes closed.

As the furor died down another girl in the choir erupted into loud glossolalia, triggering renewed and even more fervent ecstasy in the congregation. One of the choir girls, who moments before was pacing the room, moved to the pulpit behind the pastor and laid hands on him, speaking in tongues while he simply stood there watching the

proceedings. A man who was assisting Richie began rapidly pacing around the congregation, flailing his arms, eyes closed, praising Jesus. Another man who had moments before been talking with me casually in the foyer got caught up in the ecstasy and began speaking in tongues, as did a woman behind me.

After 15-20 minutes the pastor asked the congregation to “restrain your anointing,” which was unusual, as they usually defer to the movement of the Spirit. He started preaching over it, whereupon it died down within a few minutes. The sermon he proceeded to give seemed informed by either Richie’s display or previous knowledge of Richie and Amanda’s personal issues. It dealt with cleaning one’s own metaphorical house and not focusing on others. Jesus shows his concern by chastising those he loves, he said, and it is a good sign to be chastised by God because it means he loves and is paying attention to you. The pastor said we have to be vigilant to be sure tongues are God and not the devil, that entire churches can be tricked. Without commenting directly on Richie, he said, “anointing is good. Tongues are good. But the devil knows more tongues than all of us put together.”

At the end of the sermon the pastor made the typical altar call, wherein he invites to the altar people who wish to be prayed for or who are ready to accept Jesus Christ. He said the Holy Ghost was telling him “there is someone out there who wants Jesus in his or her life, but you can’t get up out of your seat—that person needs to just get up and come down here now.” This is a frequent invocation and will sometimes be repeated multiple times until a number of people come forward to be prayed over. Those who go forward may “tarry” at the altar while others lay hands on them. Tarrying at the altar is the embodied seeking of the Holy Ghost through emotional prayer during an altar call

that can be difficult to distinguish from glossolalia. It likely involves intense dissociation but is not glossolalia per se unless someone hears it, so it is hard to discern when a person is glossolalic on such occasions amidst the volume of general ecstasy unless one is close enough—i.e., is among those laying on hands. And only those who have received the Holy Ghost can lay hands on others, a precaution to prevent harm actually being done during such a vulnerable moment in the name of God.

Richie answered the altar call and within minutes had fallen to the floor again in what to an outsider might appear an epileptic seizure. More fervent ecstasy broke out around the house, and a group of glossolalic women including Amanda formed in the aisle. A female church officer came toward Amanda to lay hands on her forehead, and at the mere touch Amanda's feet came up in front of her. She fell backward to the floor but did not seem injured. The women gathered around Amanda and laid hands on her. It is normal for someone to stand in as a surrogate for the afflicted, as I have personally experienced, or as someone who suffers in conjunction with the afflicted, as the case initially appeared to be here.

At the same time a group in front was administering to Richie, including a woman making pulling motions away from him as though she were physically pulling demons out. It was apparently an exorcism but had the appearance of on-site triage, as if those laying on hands were medics. The group of women around Amanda dispersed, and she got back up and went to the front to assist with her husband while ecstatically speaking in tongues. Within moments an usher escorted her back to her seat, an action I have not observed before or since. She stopped her glossolalia and sat with her dress clenched around her knees, appearing anxiously concerned.

An elder who had been on the floor with Richie's head in his lap requested the microphone. He said Richie has stubborn demons in him they were having difficulty getting out and requested the congregants assist by gathering around to help pray. Richie "is fighting a fight," he said, "and can't do it without assistance." Several people went forward to help. As I moved forward for a better vantage another elder pulled me aside to tell me Richie has been having some problems so this was not unexpected.

Yet after a few minutes the pastor went to the microphone to announce, "I have never encountered something so difficult before in this church and have never had to say this to someone, but I just can't let it go anymore. You," he said addressing Amanda, "have the wrong Holy Ghost." Furthermore, he asserted that because she had the wrong Holy Ghost she was impeding her husband's recovery.

"This is not me saying this," he said. "My Holy Ghost is upset and cannot abide by this and insists that I say something, so I cannot remain quiet. You have the wrong Holy Ghost."

Both the pastor and Amanda appeared tense, though his demeanor remained calm and respectful while she seemed angry and near erupting. Standing in the middle of the hall in the midst of the congregation she defended herself to the pastor up at the pulpit, saying that she was baptized in this church. Furthermore, she said, though she regularly attends another Pentecostal church in town she has been to six Pentecostal churches altogether, and no one has ever told her she has the wrong Holy Ghost.

The pastor replied that she should have those pastors call him so he could meet with them to explain.

"My husband has been like this for two days," she said, "and I have been trying to

help him. I admit I did some bad things in the past but not since I was baptized. I go to church, read my Bible every night, and do everything I'm supposed to do. How could I have the wrong Holy Ghost?"

The pastor repeated he didn't know why, but his Holy Ghost was telling him he must express this or the problems would continue.

"I even asked my husband where he wants to go, and he said he wanted to come here so I brought him here," she said.

Though divorce is forbidden by Apostolics except in cases of adultery or the abandonment of a husband by a wife, the pastor questioned whether Richie and Amanda have a good relationship and whether it would work. This turned out to be an important clue to the drama. According to Richie when interviewed later, the accepted practice before marrying in the church is to consult the elders to receive guidance. Richie had gone against the warnings of the pastor and had not just been married to Amanda by a Justice of the Peace, he then divorced and remarried her three times over the course of two years.

While Amanda was defending herself to the pastor, other women had their hands up as if wanting to speak. The pastor held up a finger to quiet them, but they broke out in glossolalia interspersed with blurts of condemnation to the effect of "wrong Holy Ghost."

Amanda started to leave by putting on her coat, shoes, and grabbing her son, but then reconsidered and said, "You are a holy man saying I have the wrong Holy Ghost, and this is a holy building; I should be able to get the right Holy Ghost!" She removed her shoes and coat and went to the altar. She became inaudible but seemed to be demanding the proper Holy Ghost as she banged her hand on the altar. Several elite and

core members submitted and seemed to try, but after a few minutes Amanda got up, resumed putting on her coat and shoes, grabbed her son, and stormed out, slamming the door behind her.

One of the elders took the microphone and said, “God can only deliver what wants deliverance. People can only be healed or receive the Holy Ghost if they’re willing.”

Amanda seemed hostile and angry and her deferential humility toward the pastor insincere. Ironically, throughout this exchange with his wife, Richie sat in the first pew silently. Afterward, he was conversing with others and seemed unbothered by his wife’s treatment.

As this vignette makes clear, a Pentecostal service involving glossolalia is not a *de facto* stress-reducing ritual. It is a busy intersection where many things are taking place, including, in some cases like this one, stress increasing. This incident led to a reconceptualization of the glossolalia-stress-reduction model that allows for more of this variation and subtlety. The following sections discuss the “busy intersection” of Pentecostal services and how this glossolalia typology can be discerned from it. It is important to recognize the inherent ‘busyness’ of such practices because merely focusing on the stress-reducing aspects presents an incomplete picture. The objective of this study is not to oversimplify and reduce glossolalia to a function but to discern what functions make be taking place within a relative cultural context.

### *2.3 RITUAL AS A BUSY INTERSECTION*

While the incident detailed above was only one episode in several years of services and interactions I observed and took part in, it represents what cultural anthropologist Renato

Rosaldo refers to as a window on “ritual as a busy intersection” (1993). This is in opposition to the traditional notion of anthropology as objectively apprehending some self-contained ritual in depth, what Rosaldo terms the “microscopic view.” This ritual as busy intersection perspective is one that acknowledges a confluence of variables that are not always the same and that are contended with on the fly, such that meaning varies from individual to individual. This is the view taken with regard to Apostolic glossolalia and the mediation between member and non-member that must constantly take place in an evangelical culture. The “classic norms of analysis,” which defines culture “as a set of shared meanings” makes it “difficult to study zones of difference within and between cultures” (Rosaldo 1993:28). The alternative, which has become central in anthropology since the 1960s, is the study of cultural borderlands. This includes literal borderlands or “officially recognized cultural units,” like the peripheries of cities that immigrants and migrants may occupy, “but also at less formal intersections, such as those of gender, age, status, and distinctive life experiences” (Rosaldo 1993:29). The wrong Holy Ghost represents just such a ‘distinctive life experience’ and provides a clearer glimpse into the dynamism of Apostolic ritual practice than the habitus, for instance, of an informant who has spent their entire life within the bounds of the Apostolic church.

Glossolalia has been written about numerous times across many disciplines and is clearly a central element of Pentecostal practice. There is a generally defined symbolism involved with, in particular, Pentecostal and Christian Charismatic glossolalia, and elders instruct converts on the meaning of the behaviors that accompany it, from the physical trembling that they may experience, to, explicitly, the “trance” experiences they have when they receive the Holy Ghost. What is less well understood, discussed, or agreed

upon is those cases wherein a manifestation of tongues is not accepted, not done ‘correctly,’ or unconsciously or semi-consciously faked. Such undefined or murky areas of culture are rich because they represent areas of transition. A person unconsciously faking or whose experience of glossolalia is not accepted by others is acting in ways that imply an acceptance of the group’s moral code but has an incomplete or inaccurate understanding of that code. The extent to which agents accept and practice the moral code reflects their cultural competence. If they are not fully competent, a person may accept the group’s code, but the group may not yet accept the individual. This places the person at the betwixt and between. To focus on events of this kind helps clarify what defines in-group versus out-group and how the group navigates its own implicit definitions.

The wrong Holy Ghost incident is a busy intersection that draws attention to glossolalia as a meaningful signifier and how it is distinguished from the other trance states clearly observed in Pentecostal worship but rarely mentioned. This is important because these other trance states are not measured in this study but may be influential. It is also a focal event because it undermined a priori assumptions about a direct relationship between ritual dissociation and stress reduction.

Those seeking Christ and claiming acceptance actively work toward the goal of receiving the Holy Ghost and have the assistance of the evangelical ministry. The habitus transformations that influence body hexis do not happen in the instance of receiving the Holy Ghost, though this may be a transformative moment. There must be a change that leads to this moment. Spiritual baptism is the validation for this change that then accrues to it further ensuing benefits, a process outlined by Csordas (1997b) as well in his study

of Catholic Charismatic healing. In service, those striving are not simply the beneficiaries of a changing lifestyle but are actively invoking trance, and so dissociative states are part and parcel of the ritual experience even before receiving the Holy Ghost. And, given the wrong Holy Ghost incident, even those who have not clearly received the Holy Ghost but act as if, at least in the opinion of some, are involved in some persistent trance behavior, though it may be fraught with contradictions.

This busy intersection of ritual involving glossolalia led to a distinction among the types that may be observed at a Pentecostal service. Those types are outlined and discussed below. This is important because the quantitative portion of this study was designed to discern positive types that would influence stress-reduction.

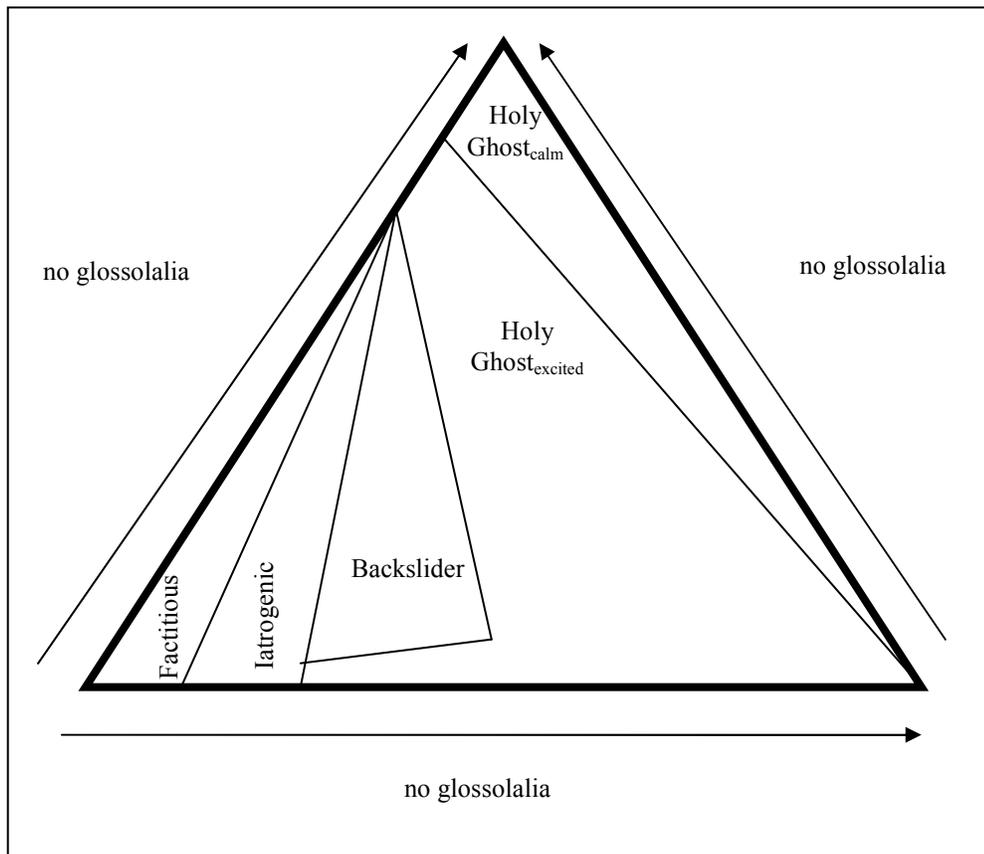
#### *2.4 TYPOLOGIZING TONGUES*

The following sections outline the variety of glossolalia types Apostolics and other charismatics may experience. It discusses why some stress reduction may be achieved indirectly at the end of a long road of spiritual development or only as a byproduct other devotional behaviors.

Given these conflicts within this border territory, and based on the work of others who, without using the same terminology, have outlined similar less discussed border areas of Pentecostal practice, including a study by psychologists Brian Grady and Kate Loewenthal (1997) that dichotomizes what I term “Holy Ghost” glossolalia below, I have developed a five-part Apostolic glossolalia typology. This typology serves only as a model subject to adjustment and revision for further research and, ultimately, may not be broadly applicable beyond the situation that inspired it. The usefulness of a simplifying model is not in transforming a borderland into a self-contained microcosm but in

providing some cognitive spheres by which to contend with cultural flux. These five types of Apostolic glossolalia are actually part of continuum of spiritual progress, as illustrated in Table 5.1, but may be roughly defined for quantitative analysis as including (1) “Holy Ghost” glossolalia (HGG), (2) “backslider” glossolalia, (3) “iatrogenic” glossolalia, (4) “factitious” glossolalia, and (5) no glossolalia.

*Figure 5.1 Non-linear spiritual pathway of Apostolic glossolalia typology*



The pathways to receiving the Holy Spirit are non-linear, though, generally speaking, people report experiencing excited sub-type first and are witnessed in this experience. The shape and directions of this depiction emulates that of climbing a mountain, in that an individual can climb it in any direction, including down. For instance, one can move from factitious to iatrogenic to backslider to Holy Ghost or any other variation or, as with most people, experience only Holy Ghost-type. The most typical first experience is excited sub-type Holy Ghost, though some people report experiencing it calmly and privately the first time. Some may argue that a first type must be witnessed and, thus, such reports actually represent iatrogenic. However, for the purposes of modeling, the possibility of experiencing calm sub-type first is represented here. A backslider, by definition, is someone who has received the Holy Ghost but slid back into sin, so it is the only type that cannot be a starting point.

HGG are those instantiations (both excited and calm variations as outlined by Grady and Loewenthal [1997]) that are acknowledged by all as legitimate and represent the goal of spiritual progress and potentially the greatest stress reduction. Backslider glossolalia is observed in those individuals who have been acknowledged as having spoken in tongues but who have slid back into a sinful life and are struggling to reassert themselves to the Apostolic path. They are considered an embodiment of a struggle between God and the devil. Iatrogenic glossolalia is instances of believing one is speaking in tongues but without full community recognition and may in fact be interpreted as the work of the Devil. And fake glossolalia is, simply, people consciously pretending to speak in tongues and, again, the work of the Devil. Demonic glossolalia may exacerbate rather than reduce stress but are stages of spiritual progress within the habitus of Apostolic practice. Such individuals are in some cases willing to receive the Holy Ghost and therefore have potential for achieving HGG.

This spectrum approach is analogous to several examples utilized by Rosaldo, a situation in which “full citizenship”—or, in the Apostolic case, membership—“and cultural visibility appear inversely related” (1993:198). In the anthropological study of borderlands, those who are full citizens or members become less distinctive than those occupying ambiguous positions, who are considered to have more “culture” to study. In Rosaldo’s examples, marginalized indigenous Mexicans and minority Filipinos (e.g., Negritos) have culture, whereas Mexican “ladinos” (monolingual Spanish speakers) and Filipino lowlanders do not. “To the ethnographic gaze, ‘civilized’ people appear too transparent for study; they seem just like ‘us’—materialistic, greedy, and prejudiced. Because ‘their’ worlds are so down-to-earth and practical, ‘our’ commonsense categories

apparently suffice for making sense of their lives” (Rosaldo 1993:199). While we must insert the caveat that, among Apostolics, it is the backsliders and new converts who are ostensibly struggling with materialism and greediness, it remains the case that elite and core members do by definition ground themselves in ‘down-to-earth,’ and ‘practical’ notions of Godliness and simplicity, while successfully navigating such ‘commonsense categories,’ roles, and statuses as husband, wife, mother, father, employee, employer, and so on. The same cannot be said of those individuals in the Apostolic borderland. It is often precisely this lack of success that brings them to the church, and it is this negotiation that becomes the subject of analysis. The danger of such study is the objectification of a relatively idiosyncratic process as a self-contained microcosm that is broadly applicable to all Apostolic churches or even all Apostolic individuals.

“Although the notion of ‘difference’ has the advantage of making culture particularly visible to outside observers, it poses a problem because such differences are not absolute. They are relative to the cultural practices of ethnographers and their readers” (Rosaldo 1993:202). Yet there are human needs and experiences that are universal, many based in our common human biology. Thus a broad construction of borderland as movement in relation to a goal—ironically, the goal of cultural invisibility to the ethnographer—can yield generalizable information.

In Rosaldo’s (1993:199-200) Philippines example, borderlands occupy both ends of the spectrum, with Negritos representing a “pre-cultural” niche in a pseudoevolutionary hierarchy. They represent occupy a geographically marginal area, subsist on foraging, and are physically socioculturally peripheral. On the other hand are the lowlanders in the fertile valley who pursue lifestyles so similar to the American colonial model that they

are equally invisible to the ethnographic eye. In Apostolic practice, at one end of the spectrum are those supportive members who come to service only on Sunday, do not speak in tongues, and leave as soon as the service is over without fellowshiping or spends the service outside smoking. At the other end are the elite members, who, in rigid adherence to idealized Apostolic belief, offer little insight into the habitus as realistically practiced. One interview in particular yielded little more than bible quotes, sermonizing, and paternalistic piety. This elite informant always appears passionate at the altar when invoking God and always calm and even somewhat placid when greeting parishioners after service. In between are those, like Richie and Amanda, who answer the altar call at one turn but are observed cursing at a child in the stairwell at another.

This spectrum also resembles the dissociation continuum in general. At one end are those individuals who cannot dissociate, who may have anxiety or the inability to filter. They may be those individuals in the pews who come but do not answer the altar call and do not understand the motivation to seek tongues. At the other end is those individuals who chronically dissociate, to the extent that they cannot function in a social environment, whether a church community or any other. In between is an “adaptive” mean that is invisible for its functionality. This functionality, as suggested, involves invisibility insofar as it is the stripping of culture, a freeing of the trappings of clannishness or materialism.

This is particularly true in the Apostolic case, where a number of signifiers indicate an affiliation with the Jamaican heritage of the congregation and a devotion to the habitus of the church (not necessarily Apostolicism). At the same time, the core members recognize these signifiers are cultural or “man-made rules” and not those of

God (in other words, universally adhered to by all Apostolics, no matter the cultural heritage or respective church). In an effort to be an Apostolic church and not a “Jamaican Apostolic” church, they acknowledge that those seeking God will not always be comfortable having Jamaican culture “shoved down their throat,” in the words of one member. “Upward mobility appears to be at odds with a distinctive cultural identity. One achieves full citizenship in the nation-state by becoming a culturally blank slate” (Rosaldo 1993:201). Thus, in climbing the rungs of the social ladder, even the elite members who started the church become invisible as they become Apostolics, who are purportedly invariable in their practice anywhere in the world, and not Jamaican or American or any other kind of ethnic Apostolic. Yet this distinction hides an underlying phenomenon captured in Bourdieu’s (1977) notion of *cultural capital*. Cultural capital is shared, learned behavior in that it is the cultural experiences, connections, and knowledge that people can have that enable them to succeed more than someone with less experience, connections, or knowledge. What is naïvely deemed “cultural,” Rosaldo emphasizes, still tends toward the self-contained microcosm of “authentic” or “traditional” and, thus, subordinate to the homogenization associated with institutional societies that appear to be lacking in such culture. The dark side of this ratio, he points out, is that “the more power one has, the less culture one enjoys, and the more culture one has, the less power one wields” (1993:202).

Among Apostolics, however, power is not necessarily viewed in absolute terms. Cultural capital and, thus, invisibility, is accrued through acceptance and giving up to God any overarching concern with social mobility. Apostolics are not ascetic in that they do desire fine cars, a nice home, and modern amenities. Indeed, they pray for them every

time they collect tithing at one church. But they suggest that by following God's directives, one may receive these as gifts of God after trials and suffering. Suffering is a human condition that must be endured for spiritual enlightenment, and acceptance of such is cultural capital. This acceptance and continued Apostolic practice mobilizes social support—i.e., connections—and the concomitant dimensions of Apostolic success. These are not synonymous with materialistic success, and it is common to find statuses inside the church in stark contrast to those outside. Church elites and core members may be successful in their material lives or they may be unemployed and living in housing projects. Success in the Apostolic community is not measured in materiality. Achieving material success but lacking spiritual acceptance, even as a Jamaican immigrant—a visible borderland in this case—is ethnographically interesting because it is different.

The wrong Holy Ghost incident outlined above contains at least three different emic forms of glossolalia—that exhibited by Richie, that by his wife Amanda, and that by those laying on hands and perhaps others. Emic distinctions are critical in glossolalia research. For example, if only self-reports of glossolalia frequency or experience were measured, those of Richie, Amanda, and the others might be indistinguishable, and observation suggests that they are distinct and, more importantly, affect stress very differently. The “socially structured situation in which the agents’ *interests* are defined” are the same, but the habitus, “as a socially constituted system of cognitive and motivating structures,” varies among individuals between and within such groups. The “socially constituted system” is as such merely a “secondary principle” guiding agency, “intervening when the primary principle, interest, fails” (Bourdieu 1977:76). In the Apostolic church, the socially constituted system is essentially codified in the bible,

though as a polyglot assembly of history, myth, and genealogy, it still falls short of a set of rules. But the system extends beyond the bible, as its interpretation is constructed in Apostolic terms, and, significantly, expressly predicts the failure of primary self-interest and warns people to adhere to secondary principle. By integrating emic distinctions in simplifying models, fine-grained biological variations among glossolalia types and the biological impact at the level of stress of individual degree to which these secondary principles are fulfilled may be detectable.

Such typologizing admittedly veers toward what Bourdieu warned of a system “explicitly or implicitly treat[ing] practice as a mechanical reaction, directly to the mechanical functioning of pre-established assemblies, ‘models’ or ‘rôles’” (1977:73). The danger of such positivist typologizing, he warns, is the infinite number of behavioral types to which such an approach ultimately leads. Yet, he also supports that inference can be made objectively, independent of “the conscious and deliberate intentions of their authors” (1977:73). This typology is not linear in the manner that a series of behaviors can be assembled to resemble cultural practice. Rather, as depicted in Figure 5.1, it outlines sub-fields of behavior within the field of the Apostolic-constituted system that constitutes degrees of variation and, to some extent failure, of agency directed toward primary interest to satisfy the tenets of Apostolic belief and habitus. What is useful about such sub-fields is a possible ability to determine implications of variations in habitus and degrees of implemented cultural capital on stress. Stress and other implications to health of habitus are, to extend Bourdieu’s theoretical paradigm, “the imperceptible cues of body *hexis*” (1977:82). Rendering such *hexis* perceptible while acknowledging the web of habitus and implementation of cultural capital is the central focus of this study. In

some ways this is possible because socially-constituted Apostolic behavior is in several ways sufficiently circumscribed and explicitly predicts that stress will be reduced and health improved by adhering by its principles, measures of such can be considered measures of “cultural competence.”

Every confrontation between agents in fact brings together, in an *interaction* defined by the *objective structure* of the relation between the groups they belong to...systems of dispositions...such as linguistic competence and a cultural competence and, through these habitus, all the objective structures of which they are the product, structures which are active only when *embodied* in a competence acquired in the course of a particular history... [Bourdieu 1977:81]

But it is not merely degrees of competence or cultural capital that are in play, as this suggests that all agents are uniformly striving to attain this secondary principle of Apostolic habitus. Whereas some agents have internalized or embodied, to the extent that is possible, their perception of the secondary principles to such an extent that they are synonymous with their primary self interests, other agents pick and choose elements of the secondary principles—the Apostolic Pentecostal tenets—to include among their primary interests. In terms of personal agency within Apostolic practice, this sets Apostolic tenets up as orthodoxy and some purposive deviations thereof as heterodoxy. For example, in interviewing Richie regarding his experience, it was clear that he felt misunderstood by the congregation and that he was on a unique spiritual path. He described at length prescient dreams he felt were gifts from God. By the same token, as suggested by the varying degrees of emphasis different denominations of Pentecostalism place on glossolalia, what is considered heterodox about Amanda’s behavior is, at least according to her, considered orthodox at her other church.

As Bourdieu says, “the taxonomies of the mythico-ritual system at once divide and unify, legitimating unity in division, that is to say, hierarchy” (Bourdieu 1977:165).

This is not an explicitly logical hierarchy, nor should it be, as symbolic systems bring into play practical functions through historical processes that are not, by default, straightforward or ‘by-design’—i.e., linear and mechanistic (Bourdieu 1977:109). Because of this historical development—in emic terms, designed by God, not human (though they say “man”)—

the mythico-ritual categories cut up the age continuum into discontinuous segments, constituted not biologically (like the physical signs of ageing) but socially, and marked by the symbolism of cosmetics and clothing, decorations, ornaments, and emblems, the tokens which express and underline the representations of the uses of the body that are legitimately associated with each socially defined age. [Bourdieu 1977:165]

Such socially defined age in Apostolic terms has to do with maturity of faith as connoted by time in the church and baptism of the Spirit. Members who do not achieve Spiritual baptism within a year of joining the church, if they are active and attend regularly, are considered in some ways ‘stunted’ (as they considered me in one case) and relegated to supportive and marginal roles.

Thus, as Bourdieu points out, decoding this plexus of habitus in which cultural competence is implied by HGG and orthodoxy suggests the body hexis of reduced stress and happiness is not simply understanding “the internal logic of a symbolism but of restoring its practical necessity by relating it to the real conditions of its genesis, that is, to the conditions in which its functions, and the means it uses to attain them, are defined” (1977:114). The purpose of taxonomic distinctions of glossolalia, in other words, is not “inspired by nostalgia for the agrarian paradises, the principle of all conservative ideologies,” as, historically, participant anthropology has done in constituting functionalism irrespective of individual and cultural historical processes (1977:115). The purpose is to make a connection between degrees of cultural competence and

implementation of cultural capital, implications to body hexis, and the historical processes that can lead to these variations. Operationalizing a resolution to this problem is taken up in the next section, which is essentially a problem of determining how brethren get emicly classified (implicitly, not expressly, as these classifications are, we must remember, mine) despite the absence of a coherent classification system.

Everyone's personal history is different—it is simply not orthodox—thus, heterodoxy is incoherent. With orthodoxy and heterodoxy, doxa is always implied, in this instance it is implied acceptance of the moral code and belief in the power of God.

Ironically, while in this study it is not participatory anthropology that is based on “nostalgia for the agrarian paradises,” the traditional Pentecostal movement is. This further complicates such operationalization because cultural competence is not defined as achieving an agrarian ideal of ‘oneness with nature’ in the sense suggested by more materially ascetic religious movements that spurn technology or popular culture. Most of the participants in this study were immigrants and, as with Wedenoja's (1980) analysis, have embraced many material goods not previously accessible to them, which they by and large do not find inconsistent with Apostolic principles. One exception that came up in an interview is that women in the United States can get away with ‘processing’ their hair, while in Jamaica they are much more rigid about keeping it “natural.”

Thus, despite the material reviewed in earlier chapters regarding cross-cultural dissociation and even Apostolic Pentecostalism, historical variation renders comparison within congregations difficult, let alone cross-culturally. Operationalizing a means to discern among types of glossolalia implies a closed concept of logic, “of treating movements of the body and practical manipulations as purely logical operations”, which

presents a problem in that such objectifying renders practical succession into represented succession (Bourdieu 1977:116-117) and thus only approximates a generic version of Apostolic behavior. Yet, rather than throw our hands up at this ubiquitous complication, we acknowledge that while no neat mechanistic model can be proffered, simplifying models can still provide some clarity and bring to light questions. The discovery of new questions is what elucidates this complexity and, to extend this Bourdieuan paradigm, undermines doxa, rather than establishing a final answer, which is the replacement of one doxa with another.

The spiritual desire and lifestyle changes (changes in personal habitus) that must be made to receive the Holy Ghost place individuals on a path likely to also entail physiological (body hexis) changes or differences, such as those measured in this study, which may further result in incremental positive health outcomes. Such changes are not necessarily evident through epidemiological measures of population health since they are reflected in an absence rather than a presence of people with risk indicators (such as elevated stress). This indirect route has been termed the “reactivity hypothesis,” in that it potentially influences or has been found to be an associated risk for but is not directly causative of cardiovascular diseases, diabetes, cancer, obesity, and mental disorder (Markovitz and Matthews 1991). By identifying steps along the path of spiritual transformation, it may be possible to detect such incremental changes, which, as Csordas (1997b) points out, is the role of anthropological analyses. In his study of Charismatic faith healing, it was not the ritual of healing that proved as powerful as it was a catalyst for individuals to enter the faith healing system. Health benefits accrue through partial, everyday rituals of healing and support with greater changes over the long term. Positive

outcomes like these can only be illuminated by inference, for instance if one were to find that those who speak in tongues daily have statistically lower rates of stress-related diseases when compared to non-religious or, better yet, to religious practitioners with less experience of the Holy Ghost.

Toward facilitating such detection the typology in Table 5.2 identifies key aspects of the spiritual path of Apostolics. It is adapted from that of DID (Table 2.3). This in no way should be interpreted as insinuating that glossolalia is pathological or a disorder. Simply, this typology provides a useful model for outlining culturally-relative forms of dissociation for cross-cultural comparison. It is also not meant to connote any linear progression, as types can be experienced in almost any order, as illustrated in Figure 5.1, and most individuals seem only to ever experience one or two types.

*Table 5.2 Five types of Apostolic glossolalia*

Type	Cause	Outcome	Dissociative intensity	Dissociative frequency
Holy Ghost <sub>calm</sub>	Baptism of the Spirit	Acceptance	Lowest	Highest
Holy Ghost <sub>excited</sub>	Baptism of the Spirit	Acceptance	Moderate-high	Lowest-moderate
Backslider	Demon battling God	Exorcize	Highest	Moderate
Iatrogenic	Desire for acceptance	Chastise	Moderate-high	Highest
Factitious	Desire to test or manipulate?	Ignore or ban	Moderate*	Highest*

\*I am not aware of having observed factitious glossolalia in person, so intensity and frequency are hypothetical.

The spiritual pathway of Apostolic devotion is a continuum that may be entered at any point. Individuals negotiate this pathway based on their own life experiences. Baptism of the Holy Spirit is the crux of this pathway that involves numerous sociocultural variables that individuals negotiate in a social setting in which others are going through similar though distinct processes. Those individuals struggling on said

path tend to draw ethnographic attention because, when ‘correct’ behavior is undefined, identifying aberrant behavior becomes of means of ethnographically interpreting a cultural system. In observing such deviations in relation to those core and elite members who supposedly do things the correct way, I have developed a glossolalia typology that hypothetically has a relationship to the degree of stress-reduction a person experiences.

In the current study, categorizing individuals based on glossolalia types was done through a self-report questionnaire based on this model. This was problematic, as awareness of having experienced iatrogenic glossolalia may only come sometime after the fact or not at all, and it may even be a perspective held by others but not shared with the ‘afflicted’ individual. Additionally, fake glossolalia is by definition dishonest, so it is not expected that individuals admit that they currently fake them. However, because honesty is a primary tenet of Christianity, participants are likely more honest than the general population in their responses to questions such as “Has anyone ever told you that it is the Devil rather than the Holy Ghost that is speaking through you?” It may therefore be possible to detect individuals who have recently been in these positions and since moved on or become aware, as proved the case with one participant. As further evidence, several key informants readily admitted their status as backsliders. Chapter 7 outlines a model for objectively detecting such types in future research.

### *3. SUMMARY*

Pentecostalism was the fastest growing form of Christianity in the 20<sup>th</sup> century, a statistic attributed by some to the centrality of glossolalia and affect on the body hexis of stress. Apostolics in particular focus on speaking in tongues more than other denominations of Pentecostalism. The two congregations in this study were selected because they are

Apostolic, located in similar adjacent towns, and of an appropriate size manageable under the constraints of the current investigation.

The centrality of glossolalia in Apostolic faith obscures the fact that Pentecostal ritual is not focused exclusively on achieving tongues. Tongues are merely representative of a position on a devotional continuum important to Apostolic habitus. No clear rules exist for how to pursue this habitus outside of the Apostolic interpretation of the bible so individual agents vary in their cultural competency in fulfilling the idealization of this habitus. This variation may represent different degrees of stress moderation through glossolalia, as Apostolic habitus includes several other dimensions of stress reduction, including humility and social support. The combination of Christian humility, social support, and other dimensions of Apostolic habitus that individuals embody can produce more stress-reduction than glossolalia alone, and if not accepted, rejection of glossolalia as divine by other members may even exacerbate stress. Yet this appears to be part of the learning process for some, especially those who convert as adults. A typology based on this busyness of personal intersecting variously with Apostolic habitus is the basis for this project's quantitative sampling as outlined in chapter 6.

## 6. METHODS AND MATERIALS

The previous chapter reviewed the characteristics of Apostolic Pentecostals and outlined the particular histories of the congregations selected for this study. The wrong Holy Ghost incident provided a window upon the busyness of ritual praxis, which are not a de facto stress-reducing sessions. It is important to recognize this because quantitative research that did not try to account the reality of this busyness would invariably be simplistic in design and threaten to undermine the veracity of this research. It is important to present a nuanced portrayal of such biocultural research so that estimations of generalizability can be made.

This chapter outlines the design of the quantitative portion of this study in which glossolalia and stress are measured. It outlines the specific hypotheses that will be tested, reviews the appropriateness of the sites chosen for the research, the data sources utilized, and the methods of data collection.

### *1. HYPOTHESES*

1. On Sunday, the day of service, stress hormone aggregates will be higher among those individuals with relatively numerous lifetime glossolalia experiences compared to those with relatively few. Pentecostal services involve experiential worship by everyone, and stress hormones should be activated by this general level of activity in everyone; but only the more active members of the church attend all Sunday services. Consequently, it is expected that 10 a.m. and 2:30 p.m. measures, taken just before and just after services will be similar for all participants. This similarity reflects the activity of getting ready for church at 10 a.m. and just finishing church at 2:30 p.m. Subsequently, it is expected that those

with relatively more glossolalia experience will display higher levels at 6 pm.

2. There will be greater changes in hormone levels between 2:30 and 6 p.m. on Sunday in those with less glossolalia experience because they often do not attend evening service and therefore their activity level decreases. It is expected that there will be greater changes between 6 p.m. and 10 p.m. in those with more experience because more of them attend evening service and therefore have a higher activity level for longer but that it then quickly returns to homeostatic baseline after service.
3. On Monday, those with more glossolalia experiences will have lower aggregate and profile hormone measures at each time point because that greater experience has habituated their stress response to be less reactive to daily stressors.
4. The change in hormone levels between measures on Monday will be similar in both groups, except for the last change (6 to 10 p.m.), when those with relatively fewer experiences will have a greater level drop as their bodies relax from higher relative daytime levels.
5. Those with relatively more glossolalia experiences will have lower aggregate and individual stress hormone profile measures on Monday than on Sunday. They are stimulating their stress response through worship on Sunday, which has habituated their stress response to be less reactive to daily stressors, as indicated by lower levels on Monday. Those with relatively fewer experiences, by contrast, are also stimulating their stress response through worship on Sunday but have less lifetime experience doing so and thereby have not habituated their stress response to be less reactive to daily stressors.

6. In sum, it is hypothesized that, when other potential stress influences are controlled for, glossolalia experience is inversely related to aggregate measures of stress hormones on Monday but not on Sunday.

## *2. FIELD SITES*

From March 2008 through April 2009, I collected quantitative data at the same two congregations in New York's Hudson Valley. These congregations were chosen based on their constituency and location. Both are located in small adjacent cities (Poughkeepsie and Kingston) with a relatively low socio-economic demographic profile. Twenty percent of individuals are below poverty level in Kingston and Poughkeepsie (13.3% U.S.) with 58% and 57% renting their housing (32.7% U.S.), respectively (U.S.Census Bureau 2000). I chose these cities because of my familiarity with and proximity to them. Pentecostalism has made significant inroads among the poor both in the United States and abroad, and these two churches are located in the poor neighborhoods of these cities that have large immigrant (mostly Mexican and Jamaican) populations. These populations are significant to the project because of the data I can build upon that have been collected regarding Pentecostalism in Jamaica (Austin-Broos 1997; Wedenoja 1978; 1980) and in the United States (Anderson 1979; Cox 1995).

Both churches offer weekly Sunday morning and evening services, weekday prayer/bible study meetings (Tuesday for one, Wednesday for the other), and Friday youth meetings, as well as monthly women's and men's meetings. They have choir practice once a week. Additionally, they hold dinners, gospel concerts, and frequently travel together for fellowshiping with other congregations and for leisure activities (such as men's cricket, among the Jamaicans).

## *2.1 SAMPLING*

### *2.1.1 Sample size.*

The limited size of the congregations made random sampling impossible, and adding additional congregations to the study to increase the size of the target population would have added variability in other ways difficult to control for. A sample size of 60 participants was determined by power analysis given  $\alpha=0.05$ , power of 0.80, effect size of 0.50 and 12-32 dependent variable measurements. G\*Power 3 statistical software (Faul, Erdfelder, Lang, and Buchner 2007) was used for this computation.

The effect size used was drawn from a meta-analysis of mindfulness-based stress reduction (Grossman, Niemann, Schmidt, and Walach 2004), which separated analysis by study design and whether outcomes were related to physical or mental health. The aggregation of 18 observational studies comparing pre- and post-tests of participants using mindfulness meditation to influence mental health (N=894) produced a mean effect size of 0.50, though sensitivity analysis suggested that this be cautiously interpreted due to heterogeneity of subgroups (patients and nonpatients). A recent biochemical study testing Shinrin-yoku (Park, Tsunetsugu, Kasetani, Hirano, Kagawa, Sato, and Miyazaki 2007), another form of relaxation to lower stress, found a significant reduction in salivary cortisol among the Shinrin-yoku group in a sample of only 12 university students.

### *2.1.2 Recruitment*

The study was explained to each congregation en masse after a Sunday service. Participants were approached about the study by me or a trained research assistant during fellowshiping before and after services. The study was explained to them again in brief, and they were asked if they wanted to participate. One hundred two individuals were approached. Seventy-three participants were enrolled in the study, but 12 either dropped

out or did not sufficiently complete either portion of the study protocol and were excluded from data analysis. Sixty participants (59%) were included in data analysis. Ages ranged from 18-69. Those refusing and dropped from the study included elite, core, supportive, and marginal members and are not considered different from those included. Participants were offered \$50 compensation for full participation, which could be given to them directly or donated to the church. Ten participants accepted direct compensation, and it was donated to the respective church for the rest.

### *3. DATA SOURCES*

Several data sources were used in the quantitative portion of the study, including questionnaires, the observations and interviews outlined in the preceding chapter, and saliva samples. The following section reviews these sources.

#### *3.1 QUESTIONNAIRES*

Cultural consonance—the degree to which individuals approximate in their own beliefs and behavior their culture’s encoded prototypes for such (2007a)—was measured by focusing on two behaviors that may be positively correlated—religiosity/faith maturity and glossolalia experience. Informants self-identify foremost as Apostolic Christians. Therefore, according to the cultural consonance model the most relevant variable influencing their stress is adherence to Apostolic principles, which are, ostensibly, nearly synonymous with Christian fundamentalism. There are a number of reliable and validated scales to measure consonance with Christian values. Two questionnaires were chosen that were expected to correlate inversely with stress perception.

The assessment of cultural consonance in relation to stress was done via biomarkers, as discussed, and stress appraisal. As outlined in chapter 4, appraisal can

enhance or reduce the influence of potential environmental stressors. Life events lists and daily hassles were considered as part of this design but, in keeping with Turner and Wheaton's (1995) recommendations, considered redundant. This redundancy can be invaluable to a precise assessment of stress in a clinical population but a burden in non-clinical field investigations. For example, the study initially utilized the PERI-LES (Dohrenwend, Krasnoff, Askenasy, and Dohrenwend 1978) for quantifying and weighting potentially stressful life events, but it is a 125-item tool. Participants are instructed to only respond to those events they have experienced in the past year, but, when not administered by a researcher, there was a tendency to skim the directions or skip them altogether and, as with other questionnaires being administered, answer every single item. This contributed to a time-delay that led some participants to only complete the questionnaires over an extended period or turn in incomplete questionnaires. To ensure expeditious completion of the questionnaires within a time period relative to the biomarker assessment, the PERI-LES was dispensed with.

Following are the questionnaires that were included in the final research design with reliability and validity information where available.

### *3.1.1 Glossolalia experiences questionnaire.*

The glossolalia experiences questionnaire was designed based on the glossolalia typology outlined in the previous chapter. Items queried how many times glossolalia had been experienced, as well as durations and frequencies of extreme and average experiences. These dimensions were considered salient based on preliminary data. For instance, quantity of lifetime experiences of glossolalia does not take into account the period of time over which the experiences have occurred. Likewise, some people have fewer but

more intense and longer lasting experiences. However, despite an effort to sample individuals across the glossolalia typology, there were not enough participants in each group for analysis. Several other options provided for by the glossolalia experiences questionnaire were tested using linear regression on the Monday aggregates (mean of diurnal measures) of cortisol and  $\alpha$ -Amylase.

Possible variables for grouping based on glossolalia experience included lifetime glossolalia experiences (LGE), years of glossolalia experience (calculated by subtracting current age from age of first experience), frequency of experiences, average duration of experiences, average intensity of experiences, or an indexical rate of experience. This rate was devised using lifetime experiences, average frequency, average duration, and number years since first experience. It is computed as a rate because it is hypothesized that a greater change will accrue for those who have experienced more glossolalia with respect to time, rather than simply having experienced more in general. For example, an individual who has 50 glossolalia experiences in one year will experience more physiological change than an individual who experiences the same number over 50 years because the former individual is more consistently activating his or her stress response. The glossolalia experiences index (GEI), therefore, is the number of lifetime glossolalia experiences (LGE) multiplied by the average time of each (TIME) multiplied by average intensity (INTENSITY) divided by the number of years since the first experience (YEARS)— $GEI = (LGE \times TIME \times INTENSITY) / YEARS$ .

LGE was the dimension of glossolalia most suggestively and significantly associated with the difference between Sunday and Monday aggregates of cortisol ( $p=0.09$ ) and  $\alpha$ -Amylase ( $p=0.009$ ), respectively, and was therefore used for grouping

participants. Observational data was used to determine that those experiencing 20 or fewer lifetime experiences were either newly baptized in the Holy Spirit or had only experienced glossolalia a few times over a number of years. Those reporting 21 or more experiences were those reporting experiencing glossolalia daily, weekly, or monthly. This is consistent with the groupings used in Hine's (1969) functionalist study of glossolalia.

Additionally, each dimension of the scale can be used in analysis, including lifetime glossolalia experiences (LGE) (reported on ordinal scale as 0, 1-5, 6-10, 11-20, 21-50, 51-100, or 101 or more), average frequency of glossolalia (reported on ordinal scale as "never," "a few times ever," "once a year or so," "few times per year," "monthly," "weekly," or "daily"), average duration (reported on ordinal scale as "never," "less than 10 seconds," "10-30 seconds," "30-60 seconds," "1-5 minutes," "5-15 minutes," "15-30 minutes," or "more than 30 minutes"), ability to control body during glossolalia (reported as "yes," "no," "sometimes," or "N/A"), awareness during glossolalia ("N/A," "yes," "no," or "sometimes"), and ability to recall glossolalia experiences ("yes," "no," "sometimes," or "N/A").

### *3.1.2 Faith Maturity Scale (FMS).*

Maturity in one's faith can potentially covary with integration within a religious community. Maturity suggests duration of experience and internalization of doctrine and praxis. The internalization of faith has been found to covary with stress (Koenig 2002), so the FMS was included in this study. The FMS will be used to determine if groups determined by variations in glossolalia experience differ by faith maturity and in multivariate regression to determine if faith maturity is a significant influence on biological measures of stress.

The FMS is a 38-item self-report of “the degree to which a person embodies the priorities, commitments, and perspectives characteristic of vibrant and life transforming faith, as these have been understood in ‘mainline’ Protestant traditions” (Benson, Donahue, and Erickson 1993:3) used to measure internalization of religious principles or maturity (Allport 1960). It utilizes a 7-point Likert scale from “never true” to “always true.” The FMS is scored by reversing the five negative items (5, 10, 25, 26, and 35) and calculating the mean, which yields a global faith-maturity score between 1 and 7.

Cronbach coefficient alpha reliabilities across all categories (age, gender, denomination, and respondent category) range from 0.84 (females over 69 years) to 0.90 (males 60-69 years), demonstrating high reliability. The FMS is deemed to have face validity at least with respect to the denominations represented on the panel of experts utilized in its construction, which included Christian Church, Disciples of Christ; Evangelical Lutheran Church in America; Presbyterian Church, U.S.A.; United Church of Christ; United Methodist Church; and Southern Baptist Convention. A three-stage process was used to develop content validity in accordance with eight core dimensions postulated by the authors and as deemed appropriate by the expert panel. Construct validity was supported using expert raters, techniques of known groups (e.g., pastors scored high), comparison scores by age (elders scored higher than young people), and comparison to other measures (Tisdale 1999).

Maturity of faith is considered different than religiosity. Religiosity regards how religious tenets inform one’s actions in the world.

### *3.1.3 Religiosity Measures Questionnaire (RMQ).*

The RMQ was considered important in determining how effective Christian habitus, of

which Apostolics are a sub-type, is in the daily lives of congregants. This is important because most of the observations in this study took place in the church. It also includes an item for measuring the frequency of church attendance, which was to be used to categorize individuals as elite/core or supportive/marginal. Like faith maturity, religiosity was used in multivariate regression to determine if it significantly affected biological stress.

The RMQ (Rohrbaugh and Jessor 1975) is an 8-item self-report that measures impact of religion on daily life utilizing multiple choice items, rating items (with 5-point Likert scale), and one fill-in-the-blank. It is scored by determining the distribution in a sample for the fill-in-the-blank item (“How many times have you attended religious services during the past year?”) and dividing it into reasonable quartile groups, then summing across all eight items, yielding a range of potential scores from 8 to 37. In this sample, quartiles were divided at 50, 151, and 250 services attended in the past year. Many individuals did not fill this out properly, indicating instead that they attended “a lot” or leaving it blank. Estimations were made based on knowledge of the individual.

The RMQ tests high for internal reliability, with Cronbach coefficient alphas over 0.90, and is found to be unidimensional and homogeneous, with average homogeneity ratios of 0.55 (Scott 1960). The scale yields good construct validity, as females consistently score higher than males and high school-age students higher than college-age students, which is consistent with other findings in the field. It yields strong internal validity, as the four subscales produce an overall average correlation matrix coefficient value of 0.69. And it displays discriminate validity in assessing the personal religious orientation of the individual and not primarily identification with an external religious

network or social structure (Boivin 1999).

#### *3.1.4 Perceived Stress Scale-10 (PSS-10).*

As outlined in chapter 3, appraisal is an effective aspect of stress response. It is believed that faith maturity affects stress appraisal, as individuals come to believe that God will take care of things, they experience less stress about things outside their control.

Therefore, stress appraisal and faith maturity were expected to be inversely correlated.

The PSS-10 was utilized to test this dimension of the model and to determine if stress appraisal has a significant affect on biological stress in a multivariate regression model.

The PSS-10 is the 10-item version (Cohen and Williamson 1988) of the Perceived Stress Scale (Cohen, Kamarck, and Mermelstein 1983). The PSS-10 is a self-report used to assess the degree to which situations experienced in the past month are appraised as stressful (i.e., unpredictable, uncontrollable, and overwhelming). It utilizes a 5-point Likert scale from “never” to “very often.” The PSS-10 is scored by reversing the positive items (4, 5, 7, and 8) and summing all items, yielding a potential score between 0 and 40.

The PSS-10 has established reliability and validity Cronbach coefficient alphas of 0.85 (Cohen, Tyrrell, and Smith 1991) and has been found internally consistent and valid in construct (Roberti, Harrington, and Storch 2006).

#### *3.1.5 Physical Activity Index (PAI-CAQ).*

Physical activity is associated with stress reduction, so a measure of physical activity was included in the multivariate regression model to determine if it significantly influenced biological stress. Physical activity was measured using the PAI from the College Alumni Questionnaire (CAQ) designed by epidemiologist Ralph Paffenbarger, Jr. and colleagues (1993). The CAQ was developed as a standardized, uniform, easily administered, single-

sheet method of collecting epidemiologically salient information in a large population study based on longitudinal epidemiological college alumni studies (cf. Lee and Paffenbarger 2000; Paffenbarger, Wing, and Hyde 1995). The PAI-CAQ elicits information on walking and stair-climbing by asking how many blocks or stairs, respectively, a person climbs a day. Information on recreational sport or purposive exercise regimens is requested through an open-ended query and follows up with the Borg scale to rate self-perceived exertion while engaged in that activity (Borg 1982), which is an index of physiological fitness. A question that asks how often a week participants engage in an activity that results in producing sweat has been found to be the best causal predictor ( $p \leq 0.05$ ) of treadmill-tested  $VO_{2max}$  in normal subjects (Paffenbarger, Blair, Lee, and Hyde 1993:62).

This assessment of physical activity has been found valid and reliable (Ainsworth, Leon, Richardson, Jacobs, and Paffenbarger 1993; Albanes, Conway, Taylor, Moe, and Judd 1990; Washburn, Smith, Goldfield, and McKinlay 1991), including a test-retest correlation after one month of 0.72; and estimates of physical activity from the questionnaire compared to physical activity records yields a correlation coefficient of 0.65 (Ainsworth, Leon, Richardson, Jacobs, and Paffenbarger 1993).

### *3.1.7 Demographics.*

Marital status, SES, age, sleep cycle, medication, social support, smoking behavior, pregnancy status, and education were self-reported in a demographic survey to control for confounding variables. Age has been found to correlate inversely with both culturally moderated (Goodman 1972) and pathological dissociation (Ross 1997). Sleep cycle is related to cortisol cycling (Weitzman, Zimmerman, Czeisler, and Ronda 1983), so

variation among participants in average hours and quality of sleep may result in variation in diurnal cortisol profiles.

All medication, vitamin or herbal supplements, and creams were self-reported. Medications and topical solutions intended to reduce inflammation often contain steroid hormones that may elevate stress hormone measures. For example, hydrocortisone creams and ointments contain cortisone, a glucocorticoid variant that could elevate cortisol levels. Similarly, prednisone is a synthetic corticosteroid generally taken for various conditions for its immunosuppressant capabilities and is known to confound cortisol measurement (Kirschbaum and Hellhammer 2007). Estrogen replacement therapy (Edwards and Mills 2008) and estrogen-influencing birth control medication (Kirschbaum, Pirke, and Hellhammer 1995) are believed to affect cortisol, as may antidepressant medications (Pariante, Thomas, Lovestone, Makoff, and Kerwin 2004). Additionally, cold and allergy medicines sometimes contain the decongestant pseudoephedrine, which influences the release of NE. Five participants reported using one of these forms of medication and were therefore excluded from regression analysis.

Social support was self-reported using a single item querying how many individuals a person has nearby to count on in time of need. Social support is a good predictor of stress-related illness (Blake and McKay 1986). It has been well-substantiated that the more social support individuals have, the less likely they are to suffer stress-related disease (Uchino 2006).

SES was self-reported by marking a rung on a ladder scale corresponding to their interpretation of their relative standing with respect to job, income, education, satisfaction with standard of living, and prospects for the future. Roughly, rung 1 at the top

represents the best job, most money, and best education and rung 10 at the bottom the worst or no job, least money, and least education (Singh-Manoux, Adler, and Marmot 2003). A subjective measure of SES appears to be a strong predictor of ill-health, whereas education, occupation, and income separately do not fully explain the relationship for health measures that have been examined (Ghaed and Gallo 2007; Singh-Manoux, Adler, and Marmot 2003). The subjective SES correlates with a number of independent measures of social and economic status ( $p=0.01$ ), including employment grade ( $r=0.60$ ), satisfaction with standard of living ( $r=0.40$ ), household income ( $r=0.50$ ), feeling of financial security ( $r=0.40$ ), education ( $r=0.41$ ), general life satisfaction ( $r=0.33$ ), and household wealth ( $r=0.44$ ), among others. Subjective SES appears reflective of cognitive average of standard indicators free of psychological biases (Singh-Manoux, Adler, and Marmot 2003).

Correlations were conducted to determine the association between these possible covariates and measures of glossolalia. Covariates significantly correlated with measures of glossolalia were excluded from respective models.

The model includes variables believed to influence biological stress, including faith maturity, religiosity, stress appraisal, physical exercise, age, marital status, SES, sleep, social support, and cigarette use. These variables were selected based on literature review of stress physiology and qualitative data, as indicated in the following section.

### *3.2 OBSERVATIONS AND INTERVIEWS*

Field notes of observations informal interviews and recordings of formal interviews were integral to analysis of quantitative data. For instance, it made it possible to understand the relationship between Williams' church structure, frequencies of glossolalia, and stress.

Some individuals were merely inexperienced glossolalists because they were new to the church, whereas others were “Sunday Christians.” It was only possible to determine who these people were based on observations of them, as frequencies of service attendance was inconsistent. Over the course of the study, I attended over 100 services at TAC and ALT combined, and, as previously indicated, 19 semi-structured and countless unstructured interviews were conducted to gather this data.

The preliminary research suggested not only which variables might affect biological stress response but how best to approach collecting biological samples. The extended period of qualitative research enabled me to earn the trust of participants for the collection of this data.

### 3.3 SALIVA SAMPLES

#### 3.3.1 Salivary cortisol and $\alpha$ -Amylase.

To address the hypotheses of this study, cortisol and  $\alpha$ -Amylase were selected as the proxy measures of HPA and SPA axes activity of biological stress response. Cortisol and  $\alpha$ -amylase cycle daily, so several samples throughout a day over multiple days are generally used to establish a profile (Federenko, Wust, Hellhammer, Dechoux, Kumsta, and Kirschbaum 2004; Kirschbaum and Hellhammer 1989; Nater, Rohleder, Schlotz, Ehlert, and Kirschbaum 2007; Wust, Wolf, Hellhammer, Federenko, Schommer, and Kirschbaum 2000). Sampling procedures typically involve multiple samples within an hour of waking, followed by several-hour increments over the course of the day (e.g., Edwards, Evans, Hucklebridge, and Clow 2001). However, this protocol would inevitably be interrupted by Sunday midday church service in some participants, depending on when they awakened and began. To achieve the highest degree of

consistency in sampling across the most participants, the times for self-sampling were standardized. These times were selected to capture a diurnal cycle but avoid Sunday service times, when participants would be unwilling to interrupt worship to provide a saliva sample. Services typically run from approximately 10 a.m. to 2 p.m. and again from 6 p.m. until 8:30 p.m. on Sunday. Sampling times were chosen as 10 a.m., 2:30 p.m., 6 p.m., and 10 p.m. for both Sunday and Monday.

Additionally, sampling could only be done on two days in this study. The objective was to compare the stress response of participants on a day of worship to a day without worship but with normal stressors, preferably a weekday when the majority of participants were presumed to be experiencing similar vocational stressors. Sunday was chosen as the day of service, because all Christians worship on Sunday, and it is the most active worship day of the week. It would have been ideal for the non-service day to have been a day not adjacent to Sunday to avoid any worship ‘hangover’ effect on the non-service day, an effect acknowledged by informants. However, there is no such day that was consistent for both churches. TAC has services Sunday, Wednesday, and Friday; and ALT has them Sunday, Tuesday, and Friday. Therefore, Monday was chosen to avoid there being a hangover effect at just one church and not the other (as would have been the case with Thursday).

This design enabled analysis of several dimensions of stress response with respect to Apostolic glossolalia. With respect to the hypotheses, both cortisol and  $\alpha$ -Amylase were analyzed as follows:

- *Hypothesis 1*—Participants were grouped by high or low LGE and compared based on the aggregate (mean of all four measures) for Sunday.

- *Hypothesis 2*—Participants were grouped by high and low LGE and compared based on measures at 2:30 p.m., 6 p.m. and the rate of change between these measures.
- *Hypothesis 3*—Participants were grouped by high and low LGE and the aggregate and each of Monday’s measures compared.
- *Hypothesis 4*—Participants grouped by high and low LGE will be compared based on all three Monday changes between measures.
- *Hypothesis 5*—Participants were grouped by high and low LGE and differences between Sunday and Monday aggregates and each time measure were calculated for each group. These differences were then compared.
- *Hypothesis 6*—Multivariate regression analyses were performed for Sunday and Monday aggregates and the difference between the Sunday and Monday aggregates.

#### *4. DATA COLLECTION*

The following sections review collection procedures for the data outlined in the previous section, except for observations and interviews, which were discussed in the previous chapter (“2. Preliminary **RESEARCH**”). This data was collected between March 2008 and June 2009. All procedures were approved by the University at Albany Institutional Review Board and carried out with the express written permission of church elders and signed consent of participants.

##### *4.1 COLLECTION KITS*

Saliva samples were collected using commercially-available saliva oral swabs (SOSs) and swab storage tubes (SSTs) (Salimetrics LLC, State College, PA). Upon recruitment, signed informed consent was obtained, and then each participant was issued a freezable, insulated kit containing eight SSTs/SOSs, an ice pack, a paper set of questionnaires,

instructions for completing the self-sampling, and an unsigned copy of the informed consent. SSTs were labeled with their respective confidential participant ID and a number/letter indicating the sample time.

The instructions asked that participants avoid major meals for an hour before each sample, though, if not possible, to at least avoid acidic or high sugar foods and cigarettes within 20 minutes prior to collection and to avoid alcohol for 12 hours prior to beginning collection (though alcohol consumption is not tolerated among members and cigarettes strongly discouraged). Participants were instructed to rinse with plain water ten minutes before each sample to ensure no food materials remained in their mouth. They were then instructed to remove the SOS from the SST and place it under their tongue. Participants were instructed to keep it under their tongue without chewing for 1-2 minutes and to think of food to stimulate salivation as to saturate the SOS. They were instructed to then return the swab to the inner tube and cap the SST. Participants were instructed to record the date and time of each sample and to indicate any missed samples in a space provided on the instruction sheet. They were then instructed to refrigerate or freeze the entire kit if possible until pickup. These instructions were also verbally explained at the time the kits were issued.

Although studies now suggest that cortisol in saliva will remain stable for at least four weeks at room temperature (Kirschbaum and Hellhammer 2007) and  $\alpha$ -amylase for at least two (DeCaro 2008), SOSs are susceptible to mold (Aardal and Holm 1995; Chen, Cintron, and Whitson 1992; Clements and Richard Parker 1998) so the ice packs were provided so the samples could be kept cold if they were at church or otherwise outside their home when collecting samples.

Participants with cell phones that could receive text messages (this was the majority of participants) were texted ten minutes before each sample time to remind them to rinse, then texted a reminder at the sample time. Participants without cell phones received a phone call ten minutes before each sample to remind them to rinse and take the sample in ten minutes.

If a sample time was missed, participants were asked not to discontinue the study but to continue with the next sample time and in some cases to take the sample when they were able and record the time. No participants missed more than two consecutive samples on a given day, which was a criterion for exclusion the data analysis. No women reached the second trimester of pregnancy during the period of data collection, when cortisol levels rise (Kirschbaum and Hellhammer 1994), so all were included. However, two participants completed the questionnaires but did not provide saliva samples and were therefore excluded.

Every effort was made to retrieve completed kits within a week of completing the saliva sampling, whereupon they were transported to the University at Albany and stored in a freezer at -30° until assayed for cortisol and  $\alpha$ -amylase.

#### *4.2 QUESTIONNAIRES DATA COLLECTION*

Questionnaire data was collected using paper and pencil method or via an internet survey service (SurveyMonkey.com). Initially, the instruction sheet directed participants to the internet link to complete the questionnaires unless they requested a paper copy, but most participants preferred a paper copy so they were ultimately included in all kits.

Additionally, those participants who did not complete the online questionnaires in one sitting were forced to start over again, which was an inconvenience to the participants,

who then requested paper copies.

Participants were instructed to complete the questionnaires during the same week they collected saliva samples. Paper and pencil questionnaires were retrieved with completed saliva collection kits within a week of sampling in most cases, whereupon they were manually entered into SurveyMonkey.com and then downloaded to an Excel spreadsheet.

All participants completed at least the demographic and glossolalia experiences questionnaires, which were the criteria for inclusion in data analysis.

##### *5. LAB ANALYSIS*

Saliva samples were assayed for cortisol and  $\alpha$ -Amylase at The Frye Lab (University at Albany, Albany, NY). Before analysis, samples were slowly thawed on ice and centrifuged at 1500 rpm for 15 minutes to remove mucins. Performance data provided by Salimetrics for SOSs indicates recovery above 100% for cortisol ( $r=0.947$ ,  $n=20$ ) and  $\alpha$ -Amylase ( $r=0.974$ ,  $n=20$ ).

For cortisol, samples were assayed via commercially-available cortisol EIA kits (Salimetrics LLC, State College, PA). The test used 25  $\mu$ l of saliva (for each singlet determination) pipetted into 96-well microtitre plates pre-coated with antibodies to cortisol followed by cortisol bound to horseradish peroxidase. Tetramethylbenzidine was added to each well and optical density (450 nm) was determined via an ELX800 universal microplate plate reader (BioTek Instruments, Inc., Winooski, VT). All samples, including standard curve (0-3  $\mu$ g/dl) and unknowns, were run in duplicate, and outcomes represent the average. Wells containing known high and low cortisol concentrations were utilized to correct for multiple plate comparisons and had a lower limit of sensitivity of

0.007 µg/dl (0.19 nmol/L), range of sensitivity from 0.007 to 1.8 µg/dl (0.19 to 49.7 nmol/L), and average intra- and inter-assay coefficients of variation of less than 5% and 10%, respectively.

For  $\alpha$ -amylase, samples were assayed using a commercially available enzyme kinetic reaction assay (Salimetrics LLC, State College, PA). Saliva samples were diluted with  $\alpha$ -amylase diluent of phosphate buffered solution containing a non-mercury preservative in a 1:200 ratio. The test used 8 µL of diluted saliva pipetted into each well, followed by 320 µL of preheated (37°C)  $\alpha$ -amylase substrate solution consisting of 2-chloro-*p*-nitrophenol linked with maltotriose (0.01% sodium azide added as preservative). For accurate timing, one strip was measured at a time by placing it on a kinetic mixer (550RPM) at 37°. Optical density (450 nm) was determined via an ELX800 universal microplate plate reader (BioTek Instruments, Inc., Winooski, VT) at 1 minute and 3 minutes, replacing the strip on the mixer in the interim. One minute readings were subtracted from 3-minute readings and multiplied by the conversion factor, which takes the 1:20 sample dilution into account. Results were computed in U/ml of  $\alpha$ -amylase using the formula: [absorbance difference per minute  $\times$  total assay volume (328 ml)  $\times$  dilution factor (200)] / [millimolar absorbtivity of 2-chloro-*p*-nitrophenol (12.9)  $\times$  sample volume (.008 ml)  $\times$  light path (.97)].

## 6. STATISTICS

Statistical analyses were conducted using SPSS Statistics Version 17.0 for Windows (SPSS, Inc., Chicago, IL). Statistics were considered significant if  $p \leq 0.05$  and suggestive if  $p \leq 0.10$ .

Preliminary descriptives, including mean and standard deviation, were calculated

for the full sample and for low and high LGE groupings for all questionnaire variables. Student's *t*-tests were conducted to test for statistical difference between low and high LGE groups for each questionnaire variable. Correlation testing was conducted on questionnaire variables to test for consistency of data with existing literature and for an inverse correlation between religiosity/faith maturity and perceived stress.

All measures of  $\alpha$ -Amylase were normally distributed based on kurtosis and skewedness statistics  $\pm 2$ . Cortisol data was not normally distributed. All cortisol values were  $< 1$ , so transformations were performed by calculating the  $\log_{10}(x)$ .

To test hypotheses 1-5, *t*-tests were used to test for statistical differences between low and high LGE groups for aggregate means, individual time measures, rate changes *on* Sunday and Monday and differences between groups in differences in aggregates, individual measures, and rate changes *between* Sunday and Monday. To test hypothesis 6, multivariate regression analyses were used.

## 7. SUMMARY

This chapter outlined the materials and methods in the quantitative portion of this study used to test six specific hypotheses related to the influence of Apostolic glossolalia on biological stress response. The sampling procedures used at the two churches in the study were reviewed, including how participants were recruited, refusal rates, and the difference between participants and refusals and exclusions. Data sources were reviewed, including the questionnaires developed and used, operationalization of glossolalia, observations and interviews, and biochemicals derived from saliva samples. Method of data collection were outlined, including the kits provided participants for self-collection of saliva samples, days and times of sampling, and how questionnaires were

administered. Lab procedures for assaying cortisol and  $\alpha$ -Amylase were outlined, and statistical procedures for testing the hypotheses were reviewed. In the following chapter, the results from these analyses are presented.

## 7. QUANTITATIVE RESULTS

The following sections contain data from analysis of cortisol and  $\alpha$ -Amylase and questionnaires related to glossolalia, stress, and other variables.

### 1. DESCRIPTIVE CHARACTERISTICS OF PARTICIPANTS

Table 7.1 Sample descriptives

	n	rang	min	max	$x$	SD	var	skew	kurt	
church	55	1.0	1.0	2.0	1.5	0.50	0.25	0.112	-2.064	
age	53	51.0	18.0	69.0	33.7	11.28	127.34	0.646	0.276	
sex	55	1.0	1.0	2.0	1.5	0.50	0.25	0.112	-2.064	
marital status	53	4.0	1.0	5.0	1.6	0.86	0.73	2.303	7.330	
committed relationship	28	1.0	1.0	2.0	1.7	0.46	0.21	-1.003	-1.076	
education	50	5.0	1.0	6.0	3.1	1.30	1.68	0.391	-0.345	
SES	47	8.0	1.0	9.0	5.2	1.54	2.36	-0.636	1.503	
partner's SES	24	7.0	1.0	8.0	3.8	2.30	5.30	0.231	-1.417	
number of children	48	8.0	0.0	8.0	1.7	2.27	5.15	1.405	1.223	
social support	50	3.0	2.0	5.0	3.9	0.92	0.84	0.081	-1.508	
smoking	51	1.0	1.0	2.0	1.1	0.24	0.06	3.865	13.462	
hours of sleep	50	6.0	4.0	10.0	6.9	1.21	1.47	0.004	-0.058	
quality of sleep	51	4.0	1.0	5.0	3.4	1.13	1.28	-0.323	-0.244	
perceived stress	51	31.0	4.0	35.0	17.5	6.85	46.97	0.124	-0.136	
faith maturity	51	4.4	1.8	6.2	5.2	0.83	0.68	-1.700	4.849	
religiosity	51	19.0	2.0	21.0	16.5	4.65	21.65	-2.263	4.859	
exercise	45	48.0	5.0	53.0	16.4	10.10	102.07	2.336	6.343	
cortisol										
	$x_{Sun}$	41	0.7	0.0	0.7	0.1	0.16	0.03	2.407	5.637
	10AM	39	1.6	0.0	1.6	0.2	0.32	0.10	3.004	9.494
	2:30PM	36	0.7	0.0	0.7	0.1	0.14	0.02	2.298	6.745
	6PM	34	1.1	0.0	1.2	0.1	0.22	0.05	3.481	13.408
	10PM	34	0.6	0.0	0.6	0.1	0.13	0.02	2.528	6.763
	$x_{Mon}$	41	0.7	0.0	0.7	0.1	0.15	0.02	2.744	7.515
	10AM	34	1.0	0.0	1.0	0.2	0.22	0.05	2.551	7.065
	2:30PM	34	0.9	0.0	1.0	0.1	0.19	0.03	3.031	11.017
	6PM	34	1.6	0.0	1.6	0.1	0.27	0.07	4.769	25.278
	10PM	27	0.4	0.0	0.4	0.1	0.11	0.01	1.789	2.050
sAA**										
	$x_{Sun}$	48	266.9	15.5	282.3	118.6	66.52	4424.39	0.500	-0.510
	10AM	47	353.4	9.4	362.8	124.7	83.60	6989.34	0.931	1.069
	2:30PM	45	367.0	0.7	367.7	113.9	77.41	5992.18	0.929	1.332
	6PM	42	272.9	10.4	283.3	112.4	63.83	4073.71	0.547	-0.023
	10PM	45	313.9	7.2	321.1	119.4	84.60	7156.85	0.780	-0.090

		n	rang	min	max	x	SD	var	skew	kurt
	$x_{Mon}$	48	320.9	8.8	329.7	133.1	77.67	6032.29	0.320	-0.517
	10AM	42	389.0	10.2	399.2	129.2	87.38	7635.95	0.638	0.626
	2:30PM	42	346.2	0.3	346.5	127.4	82.59	6820.43	0.457	-0.310
	6PM	44	328.8	14.6	343.5	135.0	83.97	7051.38	0.418	-0.311
	10PM	38	361.9	1.0	362.8	145.6	98.06	9616.58	0.531	-0.325
glossolalia	age at 1st	50	63.0	0.0	63.0	16.5	14.05	197.43	0.869	1.025
	LGE	50	6.0	1.0	7.0	4.3	2.59	6.72	-0.172	-1.778
	frequency	45	6.0	1.0	7.0	4.2	2.30	5.27	-0.344	-1.552
	duration	50	7.0	0.0	7.0	3.8	2.02	4.10	-0.404	-0.968
	awareness	44	3.0	1.0	4.0	2.4	1.20	1.45	0.029	-1.587
	self-control	45	3.0	1.0	4.0	2.5	1.12	1.26	-0.130	-1.347
	recall	47	3.0	1.0	4.0	1.9	1.28	1.64	0.900	-1.067
	intensity	50	7.0	0.0	7.0	4.2	2.25	5.04	-0.707	-0.789
	years	50	49.0	0.0	49.0	17.2	14.77	218.02	0.545	-0.957
	GEI	50	84.0	0.0	84.0	15.3	20.10	403.82	1.769	2.807

Church (1=TAC, 2=ALT). Marital status (1=single, 2=married, 3=separated, 4=divorced, 5=widowed). SES represents self-reported placement on a visual 10-rung ladder from highest to lowest (1-10).

Committed relationship represents single participants (1=yes, 2=no). Social support represents number of people available to help (1=0, 2=1, 3=2-5, 4=6-9, 5=10 or more). Education represents highest level completed (1=some high school, 2=high school, 3=some college/trade school, 4=associate/trade school degree, 5=bachelor degree, 6=graduate degree). Sleep quality represents 5-point scale (1=I don't sleep enough and am always tired, 2=I sleep 7 hours or more but am still generally rested, 3=Sometimes I am rested, sometimes I am not, 4=I generally feel rested though may not always get a full night's sleep, 5=I get plenty of sleep and always feel well rested). Years represents years since 1<sup>st</sup> glossolalia experience. Duration represents average duration of experiences (1=never, 2=<10s, 3=10-30s, 4=30-60s, 5=1-5m, 6=5-15m, 7=>30m). Intensity represents average (1=never, 2=not intense, 3=not very, 4=neutral, 5=somewhat, 6=very, 7=extremely). Frequency represents how often (1=never, 2=few times/year, 3=once/year or so, 4=few times/year, 5=monthly, 6=weekly, 7=daily). Recall, awareness, and control represent somatic state during and memory of glossolalia (1=yes, 2=no, 3=sometimes, 4=N/A).

\*units are µg/dl

\*\*units are U/ml

Table 7.1 displays the descriptives for the sample. The low LGE group (46.7%) consists of participants who have had 20 or fewer experiences, while participants in the high LGE group (53.3%) have had 21 or more. The two groups are similar in all factors except those of glossolalia, which is consistent with the model being tested, education, and smoking. Table 7.2 displays the demographic and psychometric comparisons for the sample and low and high lifetime glossolalia grouped by LGE. GEI is significantly greater among the high LGE group. The low LGE group has suggestively more years since their first glossolalia experience. The average duration, intensity, and frequency are significantly greater for the high LGE group. The recall, awareness, and self-control

values are significantly greater among the low LGE group, with means indicating they predominantly answered “no,” “sometimes,” or “N/A.” The high LGE group is significantly more educated. Only three participants reported smoking, and all were in the low LGE group.

Table 7.2 Questionnaire descriptives dichotomized by LGE

	Hi LGE n=32		Lo LGE n=28		difference $x_{Hi} - x_{Lo}$	p
	n	$x(SD)$	n	$x(SD)$		
Males	13		17			
Females	19		11			
Glossolalia						
GEI	28	22.7(22.4)	27	5.8(10.8)	16.9	<b>0.001</b>
Years	26	13.9(10.1)	24	20.7(18.1)	-6.8	0.10
Duration	26	4.9(1.4)	24	2.7(2)	2.2	<b>0.0001</b>
Intensity	26	5.5(0.99)	24	2.9(2.4)	2.6	<b>0.0001</b>
Frequency	25	5.9(0.95)	20	2.1(1.6)	3.8	<b>0.0001</b>
Recall	26	1.3(0.7)	21	2.6(1.5)	-1.3	<b>0.0001</b>
Awareness	25	1.9(0.95)	19	3(1.3)	-1.1	<b>0.002</b>
Self-control	25	1.9(0.9)	20	3.3(0.9)	-1.4	<b>0.0001</b>
Church	30	1.5(0.5)	25	1.4(0.5)	0.1	0.33
Age	31	32.5(11.1)	27	34.7(11)	-2.2	0.45
Marital status	29	1.5(0.5)	24	1.9(1.1)	-0.4	0.07
Committed relationship	14	1.9(0.4)	14	1.6(0.5)	0.3	0.10
Number of children	24	1.7(2.4)	24	1.7(2.2)	0	1.0
SES	28	5.3(1.3)	24	5.3(2)	0	0.94
Partner’s SES	14	3.2(2)	13	4.6(2.3)	-1.4	0.10
Social support	29	4(1)	26	3.7(0.8)	0.3	0.12
Education	29	3.6(1.2)	26	2.8(1.6)	0.8	<b>0.03</b>
Cigarettes smoked weekly	0	0	3	52.3(75.9)	-52.3	<b>0.00</b>
Hours sleep	28	6.7(1.3)	27	7(1.3)	-0.3	0.39
Quality of sleep	29	3.3(1)	27	3.3(1.3)	0	0.94
Physical exercise	26	17.3(10)	23	15(9.5)	2.3	0.54
Faith maturity	29	5.3(0.6)	27	5(1)	0.3	0.33
Religiosity	29	16.4(5.1)	27	16.2(4.9)	0.2	0.91
Perceived stress	29	15.8(7.1)	27	18.1(6.4)	-2.3	0.21

### 1.2 T-TESTS

Student’s t-tests were conducted to address hypotheses 1-5. Hypothesis 1 predicts that on Sunday, cortisol and  $\alpha$ -Amylase will be higher among the high LGE group at the aggregate and 6 p.m. measures and similar at other times. As indicated by Table 7.3 for cortisol and Table 7.4 for  $\alpha$ -Amylase, all measures except 10 p.m. for  $\alpha$ -Amylase are higher among the high LGE group, though these differences are not significant. The

higher level at 6 p.m. among the high LGE group for  $\alpha$ -Amylase is suggestive.

Table 7.3 Salivary cortisol ( $\mu\text{g}/\text{dl}$ ) differences within each day dichotomized by LGE

	Hi LGE		Lo LGE		diff	<i>p</i>
	n	$\bar{x}(\text{SD})$	n	$\bar{x}(\text{SD})$	$x_{\text{Hi}}-x_{\text{Lo}}$	
Sunday aggregate	26	0.163(0.189)	18	0.092(0.106)	0.071	0.16
Sunday 10 a.m.	26	0.353(0.07)	18	0.235(0.06)	0.118	0.37
2:30 p.m.	24	0.156(0.03)	18	0.105(0.03)	0.051	0.22
6 p.m.	26	0.261(0.05)	18	0.075(0.02)	0.186	0.11
10 p.m.	25	0.167(0.03)	18	0.071(0.02)	0.096	0.24
change 10 a.m. – 2:30 p.m.	20	0.039(0.111)	16	0.070(0.167)	-0.031	0.52
change 2:30 p.m. – 6 p.m.	19	0.002(0.239)	14	0.019(0.002)	-0.052	0.79
change 6 p.m. – 10 p.m.	20	0.068(0.179)	14	0.006(0.024)	0.062	0.21
Monday aggregate	26	0.112(0.146)	18	0.116(0.173)	-0.004	0.95
Monday 10 a.m.	25	0.26(0.05)	17	0.151(0.04)	0.109	0.60
2:30 p.m.	26	0.213(0.04)	18	0.130(0.03)	-0.385	0.48
6 p.m.	25	0.107(0.02)	17	0.379(0.09)	-0.871	0.46
10 p.m.	25	0.079(0.02)	17	0.122(0.03)	-0.043	0.23
change 10 a.m. – 2:30 p.m.	18	0.024(0.044)	15	0.024(0.044)	0	0.77
change 2:30 p.m. – 6 p.m.	19	0.086(0.149)	12	-0.095(0.356)	0.181	0.06
change 6 p.m. – 10 p.m.	17	0.026(0.045)	10	0.104(0.387)	-0.078	0.42

Table 7.4 Salivary  $\alpha$ -Amylase (U/ml) statistics dichotomized by LGE

	Hi LGE		Lo LGE		diff	<i>p</i>
	n	$\bar{x}(\text{SD})$	n	$\bar{x}(\text{SD})$	$x_{\text{Hi}}-x_{\text{Lo}}$	
Sunday aggregate	28	129.24(68.25)	23	108.07(70.57)	21.17	0.28
Sunday 10 a.m.	28	132.47(0.75)	22	110.25(0.92)	22.22	0.35
2:30 p.m.	24	126.18(0.86)	22	108.76(0.77)	17.42	0.47
6 p.m.	25	136.36(0.66)	20	94.99(0.77)	41.37	0.06
10 p.m.	25	118.74(0.88)	22	112.89(0.82)	5.85	0.82
change 10 a.m. – 2:30 p.m.	24	9.2(78.26)	21	3.46(63.2)	5.74	0.79
change 2:30 p.m. – 6 p.m.	21	-11.09(64.93)	19	8.36(54.66)	-19.45	0.32
change 6 p.m. – 10 p.m.	23	18.95(63.19)	20	-17.36(72.84)	-36.17	0.09
Monday aggregate	28	150.71(79.33)	23	105.34(67.89)	45.37	<b>0.04</b>
Monday 10 a.m.	24	145.2(0.9)	22	103(0.8)	42.2	0.10
2:30 p.m.	24	124.87(0.76)	22	117.59(0.9)	7.28	0.77
6 p.m.	27	156.88(0.85)	20	98.65(0.69)	58.23	<b>0.02</b>
10 p.m.	23	169.72(0.11)	18	100.99(0.72)	68.73	<b>0.02</b>
change 10 a.m. – 2:30 p.m.	22	21.97(88.97)	20	-12.58(41.71)	34.55	0.12
change 2:30 p.m. – 6 p.m.	23	-28.28(65.5)	18	17.03(73.75)	-45.31	<b>0.04</b>
change 6 p.m. – 10 p.m.	22	-5.51(54.95)	15	2.75(41.97)	-8.26	0.63

Hypothesis 2 predicts that there will be greater changes in cortisol and  $\alpha$ -Amylase between 2:30 p.m. and 6 p.m. on Sunday in the low LGE group because they often do not attend evening service, allowing their therefore their activity level to decrease. As indicated by Table 7.3 for cortisol and Table 7.4, this prediction also appears true; however, the differences are not significant.

Hypothesis 3 predicts that on Monday, the high LGE participants are habituated to have lower aggregate and individual measures at all times. Table 7.3 indicates that for cortisol this is true for the aggregate, 6 p.m., and 10 p.m. measures, but not at 10 a.m. or 2:30 p.m.; however, none of these differences are significant. Table 7.4 indicates the opposite, that all measures of  $\alpha$ -Amylase are greater in the high LGE group on Monday, that the aggregate, 6 p.m., and 10 p.m. are significantly greater, and the 2:30 p.m. measure suggestively greater.

Hypothesis 4 predicts the Monday changes in cortisol and  $\alpha$ -Amylase will be similar in both groups except for the 6 p.m. to 10 p.m. change, when the low LGE will have a greater decrease. According to Table 7.3 for cortisol and Table 7.4 for  $\alpha$ -Amylase, the 10 a.m. to 2:30 p.m. change is similar, whereas the 2:30 p.m. to 6 p.m. change is suggestively greater among the low LGE group for cortisol and significantly greater among the low LGE group for  $\alpha$ -Amylase. There is also a greater decrease among the low LGE group from 6 p.m. to 10:30 p.m., but this difference is not significant.

Hypothesis 5 predicts that the high LGE group will have lower aggregate and individual measures of cortisol and  $\alpha$ -Amylase on Monday than the low LGE group. Table 7.5 indicates that among the high LGE group levels are significantly lower on Monday at the aggregate and 10 a.m. measures for cortisol. The opposite is true for  $\alpha$ -Amylase, with significantly greater levels on Monday for aggregate, 6 p.m. and 10 p.m. measures. The low LGE group by contrast are not significantly different on Sunday or Monday at any measure. When comparing the differences of the two groups, the difference in cortisol from Sunday to Monday is significantly greater in the high LGE group at 10 p.m. and suggestively greater at 6 p.m. For  $\alpha$ -Amylase, the increase on

Monday at 10 p.m. is significantly greater among the high LGE group than the change among the LGE group, and the aggregate increase for the high LGE group on Monday relative to the low LGE group change is suggestive.

Table 7.5 Biochemical differences from Sunday to Monday dichotomized by LGE

	Hi LGE				Lo LGE				diff	
	$x_{Sun}$	$x_{Mon}$	diff	$p$	$x_{Sun}$	$x_{Mon}$	diff	$p$	diff <sub>Hi</sub> -diff <sub>Lo</sub>	$p$
<b>Cortisol (µg/dl)</b>										
aggregate	0.16	0.11	0.05	<b>0.01</b>	0.09	0.12	-0.03	0.54	1.67	0.07
10AM	0.29	0.19	0.08	<b>0.02</b>	0.18	0.15	0.03	0.60	0.05	0.49
2:30PM	0.17	0.17	-0.0001	0.99	0.11	0.11	-0.01	0.86	0.01	0.88
6PM	0.19	0.09	0.09	0.13	0.08	0.23	-0.14	0.35	0.04	0.08
10PM	0.12	0.06	0.07	0.14	0.07	0.13	-0.05	0.14	0.12	<b>0.03</b>
10AM – 2:30PM	0.04	0.02	0.02	0.20	0.07	0.02	0.05	0.26	0.01	0.86
2:30PM – 6PM	0.002	0.09	-0.09	0.30	0.02	-0.1	0.12	0.38	-0.22	0.16
6PM – 10PM	0.07	0.03	0.04	0.27	0.01	0.1	-0.09	0.46	0.16	0.20
<b>sAA (U/ml)</b>										
aggregate	129.2	150.7	-21.5	<b>0.01</b>	108.1	105.3	2.7	0.67	-24.2	0.08
10AM	132.5	145.2	-11.6	0.62	110.3	103	-9.2	0.40	-2.4	0.91
2:30PM	126.2	124.9	-2.9	0.57	108.8	117.6	-8.9	0.57	6.04	0.83
6PM	136.4	156.9	-16.7	<b>0.04</b>	94.9	98.7	-0.21	0.98	-16.5	0.48
10PM	118.7	169.7	-46.7	<b>0.01</b>	112.9	100.9	15.6	0.33	-62.3	<b>0.01</b>
10AM – 2:30PM	9.2	21.9	-16.01	0.87	3.5	-12.6	3.3	0.83	-19.3	0.64
2:30PM – 6PM	-11.1	-28.3	12.4	0.52	8.4	17.03	-11.9	0.60	24.4	0.40
6PM – 10PM	18.9	-5.5	38.3	<b>0.01</b>	-17.4	2.7	-16.5	0.40	54.8	<b>0.01</b>

### 1.3 CORRELATIONS

The research design model predicted that faith maturity and religiosity would inversely correlate with perceived stress. Table 7.6 indicates correlations among non-glossolalia variables with sufficient observations to be included in multivariate analyses. Faith maturity and perceived stress are suggestively inversely correlated. The relationship between religiosity and perceived stress is positive but not significant. As Table 7.6 indicates, marital status is significantly positively correlated with age. Being in a committed relationship (if single) is significantly negatively correlated with marital status. Partner's SES is significantly positively correlated with participant SES. Number of children is significantly positively correlated with age and marital status and negatively correlated with committed relationship. Social support is significantly

Table 7.6 Pearson's correlations of non-glossolalia covariates

		age	sex	marital status	education	SES	number children	social support	smoking	hours sleep	quality sleep	PSS*	FMS*	RMQ*	exercise
church	<i>r</i>	-0.15	0.05	-0.06	-0.01	0.24	-0.28	-0.19	-0.22	-0.03	0.21	-0.03	0.18	-0.01	0.20
	<i>p</i>	0.28	0.71	0.66	0.97	0.10	0.06	0.19	0.12	0.83	0.14	0.86	0.20	0.96	0.18
	<i>n</i>	53	55	53	50	47	48	50	51	50	51	51	51	51	51
age	<i>r</i>		0.01	<b>0.59</b>	0.22	-0.20	<b>0.73</b>	0.12	0.14	0.19	0.00	-0.14	0.07	0.21	-0.26
	<i>p</i>		0.94	<b>0.00</b>	0.13	0.18	<b>0.00</b>	0.42	0.32	0.18	0.98	0.34	0.61	0.14	0.09
	<i>n</i>		53	<b>52</b>	50	47	<b>48</b>	50	51	50	51	51	51	51	45
sex	<i>r</i>			0.07	0.15	0.02	0.01	0.08	-0.06	-0.17	<b>-0.42</b>	0.14	0.12	0.15	0.02
	<i>p</i>			0.61	0.31	0.91	0.96	0.59	0.68	0.25	<b>0.00</b>	0.32	0.40	0.30	0.88
	<i>n</i>			53	50	47	48	50	51	50	<b>51</b>	51	51	51	45
marital status	<i>r</i>				-0.10	-0.13	<b>0.62</b>	0.02	<b>0.39</b>	0.15	-0.17	0.10	0.19	0.20	0.01
	<i>p</i>				0.51	0.39	<b>0.00</b>	0.87	<b>0.00</b>	0.31	0.23	0.47	0.17	0.16	0.93
	<i>n</i>				50	47	<b>48</b>	50	<b>51</b>	50	51	51	51	51	45
edu	<i>r</i>					-0.17	0.08	<b>0.34</b>	<b>-0.42</b>	-0.22	-0.10	-0.11	0.01	0.02	-0.05
	<i>p</i>					0.27	0.59	<b>0.02</b>	<b>0.00</b>	0.13	0.51	0.44	0.96	0.88	0.74
	<i>n</i>					47	46	<b>49</b>	<b>49</b>	49	50	50	50	50	44
SES	<i>r</i>						-0.14	-0.04	0.25	-0.20	<b>-0.33</b>	-0.11	-0.24	0.06	0.03
	<i>p</i>						0.38	0.77	0.09	0.19	<b>0.02</b>	0.46	0.11	0.67	0.85
	<i>n</i>						43	46	46	46	<b>47</b>	47	47	47	41
number children	<i>r</i>							0.17	<b>0.30</b>	0.00	-0.14	0.17	0.05	<b>0.31</b>	-0.08
	<i>p</i>							0.26	<b>0.04</b>	1.00	0.36	0.25	0.72	<b>0.03</b>	0.61
	<i>n</i>							46	<b>47</b>	46	47	47	47	<b>47</b>	41
social support	<i>r</i>								-0.16	-0.23	-0.02	<b>-0.30</b>	0.14	0.01	-0.01
	<i>p</i>								0.28	0.11	0.91	<b>0.03</b>	0.34	0.97	0.94
	<i>n</i>								49	49	50	<b>50</b>	50	50	44
smoking	<i>r</i>									0.12	<b>-0.31</b>	<b>0.29</b>	-0.24	0.17	-0.10
	<i>p</i>									0.39	<b>0.03</b>	<b>0.04</b>	0.09	0.23	0.50
	<i>n</i>									49	<b>50</b>	<b>50</b>	50	50	44
hours sleep	<i>r</i>										<b>0.29</b>	-0.18	0.12	-0.02	-0.19
	<i>p</i>										<b>0.05</b>	0.21	0.40	0.89	0.23
	<i>n</i>										<b>50</b>	50	50	50	44
quality sleep	<i>r</i>											<b>-0.33</b>	<b>0.33</b>	-0.15	-0.04
	<i>p</i>											<b>0.02</b>	<b>0.02</b>	0.29	0.78
	<i>n</i>											<b>51</b>	<b>51</b>	51	45
PSS*	<i>r</i>												-0.24	0.15	0.16
	<i>p</i>												0.10	0.28	0.31
	<i>n</i>												51	51	45
FMS*	<i>r</i>													0.16	0.18
	<i>p</i>													0.26	0.24
	<i>n</i>													51	45
RMQ*	<i>r</i>														0.13
	<i>p</i>														0.39
	<i>n</i>														45

\*PSS=perceived stress (Perceived Stress Scale), FMS=faith maturity (Faith Maturity Scale), RMQ=religiosity (Religiosity Measures Questionnaire)

Table 7.7 Pearson's correlations for glossolalia variables with other covariates

		LGE	GEI	years	frequency
church	<i>r</i>	0.07	0.11	-0.17	0.02
	<i>p</i>	0.62	0.44	0.25	0.92
	<i>n</i>	50	50	50	45
age	<i>r</i>	-0.01	-0.10	<b>0.45</b>	0.08
	<i>p</i>	0.93	0.49	<b>0.00</b>	0.61
	<i>n</i>	50	50	<b>50</b>	45
sex	<i>r</i>	<b>0.32</b>	-0.04	-0.14	0.26
	<i>p</i>	<b>0.03</b>	0.79	0.33	0.09
	<i>n</i>	<b>50</b>	50	50	45
marital status	<i>r</i>	-0.17	-0.11	0.19	-0.15
	<i>p</i>	0.23	0.43	0.18	0.33
	<i>n</i>	50	50	50	45
committed relationship	<i>r</i>	0.31	0.16	0.10	0.22
	<i>p</i>	0.11	0.41	0.61	0.30
	<i>n</i>	28	28	28	25
education	<i>r</i>	<b>0.39</b>	-0.06	0.09	0.46
	<i>p</i>	<b>0.01</b>	0.68	0.55	0.00
	<i>n</i>	<b>49</b>	49	49	44
SES	<i>r</i>	0.11	0.23	<b>-0.34</b>	0.13
	<i>p</i>	0.49	0.13	<b>0.02</b>	0.43
	<i>n</i>	46	46	<b>46</b>	42
partner's SES	<i>r</i>	-0.24	0.18	0.23	-0.09
	<i>p</i>	0.27	0.41	0.29	0.69
	<i>n</i>	23	23	23	20
number of children	<i>r</i>	0.06	-0.14	<b>0.36</b>	0.02
	<i>p</i>	0.68	0.36	<b>0.01</b>	0.92
	<i>n</i>	46	46	<b>46</b>	41
social support	<i>r</i>	<b>0.29</b>	0.10	-0.02	0.23
	<i>p</i>	<b>0.04</b>	0.49	0.89	0.12
	<i>n</i>	<b>49</b>	49	49	44
smoking	<i>r</i>	-0.26	-0.20	0.21	<b>-0.34</b>
	<i>p</i>	0.07	0.18	0.15	<b>0.02</b>
	<i>n</i>	49	49	49	<b>44</b>
hours of sleep	<i>r</i>	-0.16	-0.12	0.18	0.00
	<i>p</i>	0.28	0.43	0.23	0.98
	<i>n</i>	49	49	49	44
quality of sleep	<i>r</i>	-0.09	0.09	0.07	-0.01
	<i>p</i>	0.56	0.52	0.65	0.94
	<i>n</i>	50	50	50	45
perceived stress	<i>r</i>	-0.21	-0.17	0.16	-0.28
	<i>p</i>	0.15	0.25	0.26	0.06
	<i>n</i>	50	50	50	45
faith maturity	<i>r</i>	0.15	0.16	-0.15	0.06
	<i>p</i>	0.31	0.26	0.29	0.67
	<i>n</i>	50	50	50	45
religiosity	<i>r</i>	0.00	0.03	0.02	-0.08
	<i>p</i>	0.97	0.82	0.88	0.62
	<i>n</i>	50	50	50	45
exercise	<i>r</i>	0.05	0.16	<b>-0.30</b>	0.00
	<i>p</i>	0.73	0.29	<b>0.04</b>	1.00
	<i>n</i>	45	45	<b>45</b>	41

Table 7.8 Pearson's correlations of dependent variables and potential covariates

		cortisol $x$ (log10)			$\alpha$ -Amylase $x$		
		Sun	Mon	Sun-Mon	Sun	Mon	Sun-Mon
age at 1st experience	$r$	-0.02	0.06	0.25	-0.02	-0.06	0.08
	$p$	0.90	0.72	0.25	0.91	0.68	0.59
	$n$	37	38	22	43	43	43
duration	$r$	<b>0.36</b>	0.05	<b>0.42</b>	0.03	0.15	<b>-0.22</b>
	$p$	<b>0.03</b>	0.78	<b>0.05</b>	0.83	0.33	<b>0.16</b>
	$n$	<b>37</b>	38	<b>22</b>	43	43	<b>43</b>
awareness	$r$	<b>-0.27</b>	-0.12	-0.19	-0.05	-0.19	<b>0.26</b>
	$p$	<b>0.14</b>	0.50	0.44	0.76	0.26	<b>0.12</b>
	$n$	<b>32</b>	33	19	37	37	<b>37</b>
self-control	$r$	-0.08	<b>0.28</b>	<b>-0.32</b>	<b>-0.29</b>	-0.19	-0.09
	$p$	0.66	<b>0.11</b>	<b>0.16</b>	<b>0.08</b>	0.25	0.59
	$n$	33	<b>34</b>	<b>21</b>	<b>38</b>	38	38
recall	$r$	-0.22	-0.02	<b>-0.43</b>	-0.13	<b>-0.23</b>	<b>0.22</b>
	$p$	0.21	0.93	<b>0.05</b>	0.43	<b>0.15</b>	<b>0.18</b>
	$n$	35	36	<b>22</b>	40	<b>40</b>	<b>40</b>
intensity	$r$	<b>0.34</b>	0.04	<b>0.56</b>	0.03	0.15	<b>-0.22</b>
	$p$	<b>0.04</b>	0.82	<b>0.01</b>	0.86	0.34	<b>0.16</b>
	$n$	<b>37</b>	38	<b>22</b>	43	43	<b>43</b>
church	$r$	-0.14	-0.01	-0.13	<b>0.21</b>	0.15	0.04
	$p$	0.40	0.95	0.53	<b>0.15</b>	0.29	0.77
	$n$	40	41	24	<b>48</b>	48	48
age	$r$	<b>-0.43</b>	-0.17	<b>-0.46</b>	-0.04	-0.17	<b>0.24</b>
	$p$	<b>0.01</b>	0.30	<b>0.03</b>	0.79	0.25	<b>0.11</b>
	$n$	<b>40</b>	41	<b>24</b>	46	46	<b>46</b>
sex	$r$	0.07	-0.03	<b>0.30</b>	0.15	0.10	0.06
	$p$	0.66	0.87	<b>0.16</b>	0.29	0.52	0.67
	$n$	40	41	<b>24</b>	48	48	48
marital status	$r$	-0.19	-0.10	<b>-0.47</b>	<b>-0.25</b>	<b>-0.25</b>	0.06
	$p$	0.24	0.53	<b>0.02</b>	<b>0.09</b>	<b>0.10</b>	0.72
	$n$	39	40	<b>24</b>	<b>46</b>	<b>46</b>	46
education	$r$	0.06	-0.11	0.10	<b>0.25</b>	<b>0.27</b>	-0.09
	$p$	0.72	0.49	0.65	<b>0.10</b>	<b>0.08</b>	0.55
	$n$	38	39	23	<b>43</b>	<b>43</b>	43
SES	$r$	0.20	-0.05	<b>0.33</b>	0.03	-0.02	0.08
	$p$	0.24	0.78	<b>0.15</b>	0.87	0.88	0.63
	$n$	35	36	<b>20</b>	40	40	40
number of children	$r$	<b>-0.36</b>	<b>-0.24</b>	<b>-0.31</b>	-0.19	-0.24	0.14
	$p$	<b>0.03</b>	<b>0.16</b>	<b>0.17</b>	0.24	0.13	0.40
	$n$	<b>35</b>	<b>36</b>	<b>22</b>	41	41	41
social support	$r$	-0.02	<b>-0.24</b>	-0.23	<b>0.26</b>	0.23	-0.01
	$p$	0.89	<b>0.14</b>	0.29	<b>0.09</b>	0.14	0.97
	$n$	37	<b>38</b>	23	<b>43</b>	43	43
smoking	$r$	-0.14	-0.18	<b>-0.33</b>	<b>-0.33</b>	<b>-0.30</b>	0.04
	$p$	0.41	0.26	<b>0.11</b>	<b>0.03</b>	<b>0.05</b>	0.78
	$n$	39	40	<b>24</b>	<b>44</b>	<b>44</b>	44

		cortisol $x$ (log10)			$\alpha$ -Amylase $x$		
		Sun	Mon	Sun-Mon	Sun	Mon	Sun-Mon
hours of sleep	<i>r</i>	-0.10	0.18	<b>-0.30</b>	<b>-0.35</b>	-0.19	-0.18
	<i>p</i>	0.55	0.29	<b>0.18</b>	<b>0.02</b>	0.21	0.26
	<i>n</i>	37	38	<b>22</b>	<b>43</b>	43	43
quality of sleep	<i>r</i>	0.01	<b>0.24</b>	-0.19	0.00	0.02	-0.04
	<i>p</i>	0.96	<b>0.14</b>	0.38	0.99	0.89	0.81
	<i>n</i>	38	<b>39</b>	23	44	44	44
perceived stress	<i>r</i>	-0.09	-0.13	0.07	0.03	0.04	-0.02
	<i>p</i>	0.57	0.44	0.76	0.83	0.80	0.91
	<i>n</i>	38	39	23	44	44	44
faith maturity	<i>r</i>	<b>0.27</b>	<b>0.27</b>	-0.27	<b>-0.25</b>	-0.14	-0.13
	<i>p</i>	<b>0.10</b>	<b>0.10</b>	0.22	<b>0.10</b>	0.37	0.40
	<i>n</i>	<b>38</b>	<b>39</b>	23	<b>44</b>	44	44
religiosity	<i>r</i>	-0.12	-0.20	0.19	-0.03	-0.14	<b>0.20</b>
	<i>p</i>	0.47	0.22	0.40	0.84	0.36	<b>0.20</b>
	<i>n</i>	38	39	23	44	44	<b>44</b>
exercise	<i>r</i>	<b>0.33</b>	0.03	<b>0.45</b>	0.01	0.04	-0.05
	<i>p</i>	<b>0.06</b>	0.87	<b>0.04</b>	0.94	0.80	0.74
	<i>n</i>	<b>33</b>	34	<b>21</b>	39	39	39

$p \leq 0.20$  in bold

positively correlated with education. Smoking is significantly positively correlated with marital status and number of children and negatively correlated with education. Quality of sleep is significantly positively correlated with hours of sleep and negatively correlated with sex, SES, and smoking. Perceived stress is significantly positively correlated with smoking and negatively correlated with social support and quality of sleep. Faith maturity is significantly positively correlated with quality of sleep, and religiosity is significantly positively correlated with number of children.

Glossolalia variables used for multivariate modeling were LGE, GEI, years of experience, and glossolalia frequency. Table 7.7 indicates correlations of these variables with other potential covariates, which are listed in Table 7.2. Sex, education, and social support were significantly correlated with LGE. There were no significant correlates for GEI. Age, SES, number of children, and exercise were correlated with years of glossolalia experience. Only smoking was correlated with glossolalia frequency.

Dependent variables (DVs) for multivariate modeling were cortisol (log10) and  $\alpha$ -Amylase aggregates for Sunday, Monday, and the difference between Sunday and Monday. Table 7.8 indicates correlations of these DVs and potential covariates.

## 2. VARIABLE SELECTION

Hypothesis 6 predicts that glossolalia is more influential on the cortisol and  $\alpha$ -Amylase aggregate measures of Monday and the difference between Sunday and Monday aggregates than on Sunday aggregates. To test this hypothesis, models were constructed for each of three dependent variables (DVs) for cortisol and three for  $\alpha$ -Amylase. The DVs were (1) Sunday aggregate, (2) Monday aggregate, and (3) difference between Sunday and Monday aggregates. Furthermore, separate models were constructed for each of the three of the glossolalia variables relevant to the study—GEI, LGE, and years of experience. A model for frequency of experiences was also constructed for cortisol but not  $\alpha$ -Amylase due to insufficient observations.

The following criteria were used for model selection:

1. Models were limited to six observations per variable. Thus, cortisol models (n=41) were limited to six variables and  $\alpha$ -Amylase (n=48) to eight each.
2. Other covariates considered for regression models included those with at least the same number of observations as aggregate measures of cortisol (n=41) and sAA (n=48), respectively. Committed relationship and partner's SES were excluded from cortisol models and committed relationship, partner's SES, and SES were excluded from sAA models.
3. Pearson's correlations (Table 7.6) were used to select covariates for the models from remaining variables, except those significantly correlated with the respective

glossolalia variable tested (Table 7.7). Variables correlated at  $p \leq 0.20$  with DVs were considered.

4. If further exclusion was required, other glossolalia variables (duration, awareness, self-control, recall, intensity, or age at 1<sup>st</sup> experience) were removed first as potential confounding the glossolalia variable being test.
5. If further exclusion was necessary, they were excluded by descending  $p$  value.

These criteria suggest including covariates for each cortisol model as follows:

DV=Sunday aggregate

- *Model 1:* GEI, glossolalia duration, age, number of children, faith maturity, and exercise.
- *Model 2:* LGE, glossolalia duration, age, number of children, faith maturity, and exercise.
- *Model 3:* years of experience, glossolalia duration, awareness, intensity, and faith maturity.
- *Model 4:* glossolalia frequency, glossolalia duration, age, number of children, faith maturity, and exercise.

DV=Monday aggregate

- *Model 5:* GEI, self-control, number of children, social support, quality of sleep, and faith maturity.
- *Model 6:* LGE, self-control, number of children, quality of sleep, and faith maturity.
- *Model 7:* years of experience, self-control, social support, quality of sleep, and faith maturity.
- *Model 8:* glossolalia frequency, self-control, number of children, social support,

quality of sleep, and faith maturity.

DV=Sunday aggregate-Monday aggregate

- *Model 9:* GEI, age, marital status, SES, smoking, and exercise.
- *Model 10:* LGE, age, marital status, SES, smoking, and exercise.
- *Model 11:* years of experience, sex, marital status, number of children, smoking, and hours of sleep.
- *Model 12:* glossolalia frequency, age, sex, marital status, SES, and exercise.

Correlations suggest including covariates for each  $\alpha$ -Amylase model as follows:

DV=Sunday aggregate

- *Model 1:* GEI, church, marital status, education, social support, smoking, hours of sleep, and faith maturity.
- *Model 2:* LGE, self-control during glossolalia, church, marital status, smoking, hours of sleep, and faith maturity.
- *Model 3:* years of experience, church, marital status, education, social support, smoking, hours of sleep, and faith maturity.

DV=Monday aggregate

- *Model 4:* GEI, marital status, education, social support, smoking, hours of sleep, and faith maturity.
- *Model 5:* LGE, marital status, education, social support, smoking, hours of sleep, and faith maturity.
- *Model 6:* years of experience, marital status, education, social support, smoking, hours of sleep, and faith maturity.

DV=Sunday aggregate-Monday aggregate

- *Model 9:* GEI, glossolalia duration, recall, intensity, age, and religiosity.
- *Model 10:* LGE, glossolalia duration, recall, intensity, age, and religiosity.
- *Model 11:* years of experience, glossolalia duration, recall, intensity, and religiosity.

### 3. REGRESSIONS

#### 3.1 CORTISOL

*Table 7.9 Linear regressions on log-transformed salivary cortisol\* of Sunday aggregate by four dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
1	(constant)		-3.8	.000	52	0.21
	age	-0.4	-3.2	0.002		
	faith maturity	0.2	1.9	0.07		
2	(constant)		-3.8	0.00	52	0.21
	age	-0.4	-3.2	0.002		
	faith maturity	0.2	1.9	0.07		
3	(constant)		-11.9	0.00	52	0.07
	duration	0.3	1.9	0.06		
4	(constant)		-3.8	0.00	52	0.21
	age	-0.4	-3.2	0.002		
	faith maturity	0.2	1.9	0.07		

\*Correlations are reversed due to log-transformation.

*Table 7.10 Linear regressions on log-transformed salivary cortisol\* of Monday aggregate by four dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
5	(constant)		-5.2	0.00	52	0.05
	faith maturity	0.2	1.6	0.12		
6	(constant)		-5.2	0.00	52	0.05
	faith maturity	0.2	1.6	0.12		
7	(constant)		-5.2	0.00	52	0.05
	faith maturity	0.2	1.6	0.12		
8	(constant)		-5.2	0.00	52	0.05
	faith maturity	0.2	1.6	0.12		

\*Correlations are reversed due to log-transformation.

Models 1-4 (Table 7.9) indicate no significant relationship between glossolalia and the Sunday aggregate of cortisol. Age is a significant predictor and faith maturity

suggestive in three models, with glossolalia duration alone suggestive in the fourth. These models explain from 7-21% of the variance in mean Sunday cortisol.

Models 5-8 (Table 7.10) indicate no significant relationship between glossolalia and the Monday aggregate of cortisol. There were no significantly predictive variables in these models. The remaining variable in all four cases, faith maturity, accounts for 5% of the variance in Monday cortisol.

*Table 7.11 Linear regressions on log-transformed salivary cortisol\* of Sunday to Monday difference by four dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
9	(constant)		-9.0	0.00	53	0.18
	marital status	-0.3	-2.7	0.01		
	exercise	0.3	2.0	0.05		
10	(constant)		-9.0	0.00	53	0.18
	marital status	-0.3	-2.7	0.01		
	exercise	0.3	2.0	0.05		
11	(constant)		-8.6	0.00	54	0.17
	marital status	-0.3	-2.2	0.03		
	years of experiences	-0.3	-1.9	0.06		
12	(constant)		-7.8	0.00	54	0.22
	sex	0.2	1.7	0.09		
	marital status	-0.4	-2.9	0.01		
	exercise	0.3	2.1	0.04		

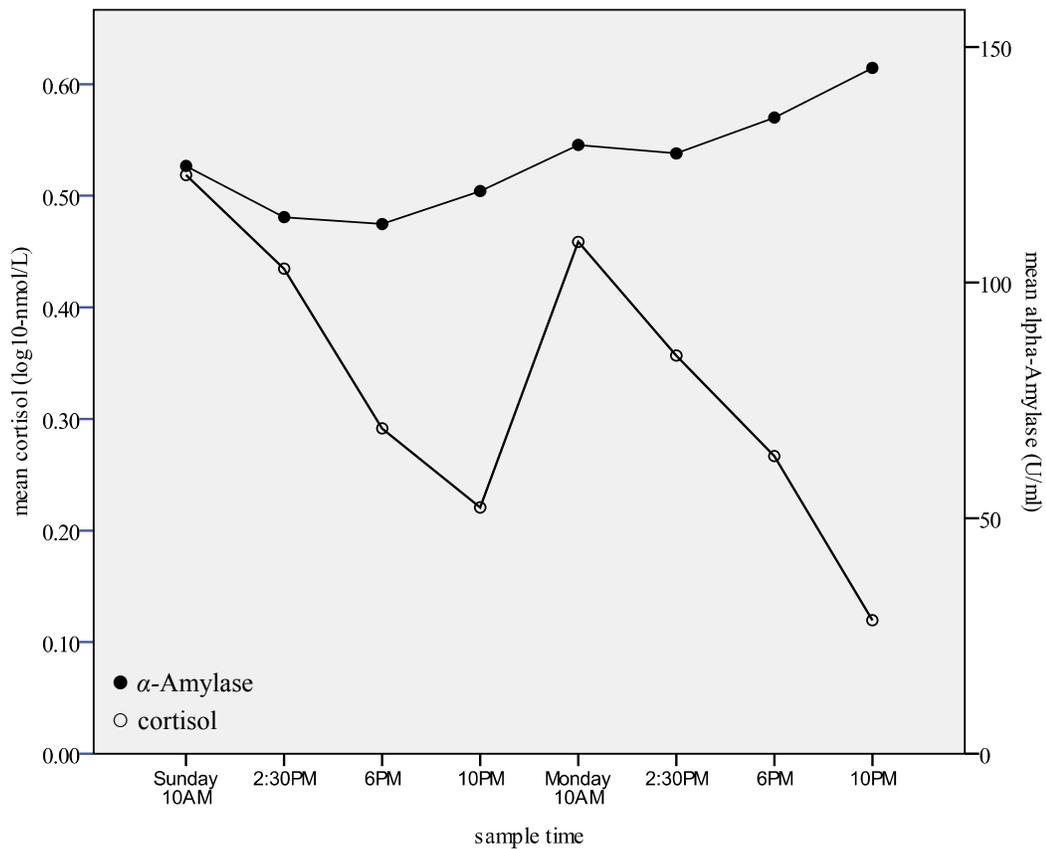
\*Correlations are reversed due to log-transformation.

Models 9-12 (Table 7.11) indicate a suggestive relationship between years since first experience and the difference between Sunday and Monday aggregates of cortisol. Given cortisol has been normalized, and that the Sunday to Monday change in cortisol is a positive value (Figure 7.1), years is actually positively correlated with cortisol. Marital status was a positive significant predictor in all models, exercise negatively significant in three, and sex negatively suggestive in one. These models explain 17-22% of the variance in the difference between Sunday and Monday cortisol.

### 3.2 ALPHA-AMYLASE

Models 1-3 (Table 7.12) indicate no significant relationship between glossolalia and the Sunday aggregate of  $\alpha$ -Amylase. Significant predictors included church attended, faith maturity, smoking, and social support, while hours of sleep was suggestive. These models explained 20-26% of the variance in Sunday  $\alpha$ -Amylase.

Figure 7.1 Diurnal courses (Sunday and Monday) of cortisol and  $\alpha$ -Amylase concentrations



Models 4-6 (Table 7.13) indicate a positive significant relationship between LGE and the Monday aggregate of  $\alpha$ -Amylase. Smoking is a negative suggestive predictor in two models. These models explain 6-7% of the variance in Monday  $\alpha$ -Amylase.

Models 7-9 (Table 7.14) indicate a negative significant relationships between LGE and the difference between Sunday and Monday aggregates of  $\alpha$ -Amylase and a

negative suggestive relationship between glossolalia intensity and the difference. Age was also or suggestive in the third model. These models explain 4-15% of the variance in the difference between Sunday and Monday  $\alpha$ -Amylase.

*Table 7.12 Linear regressions on salivary  $\alpha$ -Amylase of Sunday aggregate by three dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
1	(constant)		2.5	0.02	54	0.26
	church	0.3	2.1	0.05		
	social support	0.3	2.3	0.03		
	smoking	-0.2	-1.8	0.07		
	faith maturity	-0.4	-2.9	0.01		
2	(constant)		5.0	0.00	54	0.20
	smoking	-0.3	-2.2	0.04		
	hours of sleep	-0.2	-1.8	0.08		
	faith maturity	-0.3	-2.0	0.05		
3	(constant)		2.5	0.02	54	0.26
	church	0.3	2.1	0.05		
	social support	0.3	2.3	0.03		
	smoking	-0.2	-1.8	0.07		
	faith maturity	-0.4	-2.9	0.01		

*Table 7.13 Linear regressions on salivary  $\alpha$ -Amylase of Monday aggregate by three dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
4	(constant)		4.6	0.00	54	0.06
	smoking	-0.2	-1.8	0.09		
<b>5</b>	<b>(constant)</b>		<b>5.1</b>	<b>0.00</b>	<b>54</b>	<b>0.07</b>
	<b>LGE</b>	<b>0.3</b>	<b>2.1</b>	<b>0.04</b>		
6	(constant)		4.6	0.00	54	0.06
	smoking	-0.2	-1.8	0.09		

*Table 7.14 Linear regressions on salivary  $\alpha$ -Amylase of Sunday to Monday difference by four dimensions of glossolalia*

model	variable	Standardized $\beta$	$t$	$p$	df	$r^2$
7	(constant)		-2.4	0.02	54	0.05
	age	0.2	1.7	0.10		
<b>8</b>	<b>(constant)</b>		<b>-1.0</b>	<b>0.3</b>	<b>54</b>	<b>0.15</b>
	<b>age</b>	<b>0.2</b>	<b>1.7</b>	<b>0.09</b>		
	<b>LGE</b>	<b>-0.3</b>	<b>-2.4</b>	<b>0.02</b>		
9	(constant)		0.2	0.9	54	0.04
	intensity	-0.2	-1.4	0.16		

#### 4. SUMMARY

Data tentatively supports hypothesis 1, that cortisol and  $\alpha$ -Amylase will be higher among the high LGE group at the aggregate and 6 p.m. measures and similar at other times, but these data are not significant. Data also tentatively supports hypothesis 2, that there will be greater changes in cortisol and  $\alpha$ -Amylase between 2:30 and 6 p.m. on Sunday in the low LGE group, but these data are also not significant. Data tentatively supports hypothesis 3 for cortisol, that on Monday the high LGE participants will have lower aggregate and individual measures at all times. This is true for all but one measure, but the differences are not significant. The same hypothesis for  $\alpha$ -Amylase is not supported, with levels instead increasing significantly or suggestively across all measures. Data does not support hypothesis 4, that the Monday changes would be the same across the day for both groups, except for 6:30 to 10 p.m., when the low LGE group was expected to show a steeper decrease. Instead, the 2:30 to 6 p.m. change is more variable in cortisol and  $\alpha$ -Amylase, and the high LGE group  $\alpha$ -Amylase level increases across the day instead of decreases. The data support hypothesis 5 for cortisol, that the high LGE group would have lower aggregate and individual measures on Monday than the low LGE group, but it does not support the same hypothesis for  $\alpha$ -Amylase. Instead,  $\alpha$ -Amylase increases significantly among the high LGE group on Monday. The data tentatively supports hypothesis 6 in part, that glossolalia is more influential on cortisol and  $\alpha$ -Amylase aggregate measures of Monday and the difference between Sunday and Monday aggregates than on the Sunday aggregate. Glossolalia is more influential on the  $\alpha$ -Amylase Monday aggregate and Sunday-Monday difference but does not appear to exert the same influence with regard to cortisol.

Cortisol patterns are largely but tentatively consistent with hypotheses. Since

results are not significant, these hypotheses warrant further testing with a larger dataset. Alpha-Amylase patterns contradict the expectations of the research design in establishing a pattern opposite that of cortisol. Ethnographic data and further literature review may aid in interpreting the contradictions to these simple expectations. These data will be discussed in more detail in the following chapters.

## 8. DISCUSSION: GLOSSOLALIA INFLUENCES ON APOSTOLIC STRESS RESPONSE AND MOOD

### *1. GLOSSOLALIA AND THE PHYSIOLOGICAL CORRELATES OF STRESS*

The current study evaluated the relationships among glossolalia, religiosity, and indicators of HPA and SNS reactivity. Findings indicate a difference in the biochemical profiles of stress between groups that differ in LGE, as predicted. Furthermore, these findings validate that potential health benefits accrue for those engaged in long-term experiential religious activities through reduced stress and elevated mood.

This chapter discusses the data from the preceding chapter with regard to ethnographic data and the glossolalia typology outlined in chapter 4.

#### *1.1 SAMPLE CHARACTERISTICS*

Groups were similar in all variables except education and smoking (Table 7.2). High LGE participants were significantly better educated. This makes sense given that Apostolics emphasize pursuing a meaningful life. Pastors, their wives, and their adult-aged children were largely college educated, some with or pursuing graduate degrees. Part of the social mobility depicted in the a priori model (Figure 1.1) includes encouragement and support by the community to pursue college educations and advanced degrees. In one church, such achievements were celebrated along with birthdays, and I was once asked to speak to an individual about the value of pursuing an advanced degree. Smoking is prohibited in Apostolic habitus, though several supportive members do so. Three of those supportive members were participants and grouped as low LGE, though none had in fact received the Holy Ghost.

Correlations of variables (Table 7.6) were also largely consistent with the expected model. As predicted, perceived stress and faith maturity were inversely

correlated, but only suggestively, a correlation that might reach significance given a larger sample size. Faith maturity was also inversely correlated with cortisol on Sunday in models 1, 2, and 4 (Table 7.9) and on Monday in models 5-8 (Table 7.10), though only suggestively in all cases. Contrary to prediction, perceived stress and religiosity were positively correlated, but the correlation was not significant (Table 7.6).

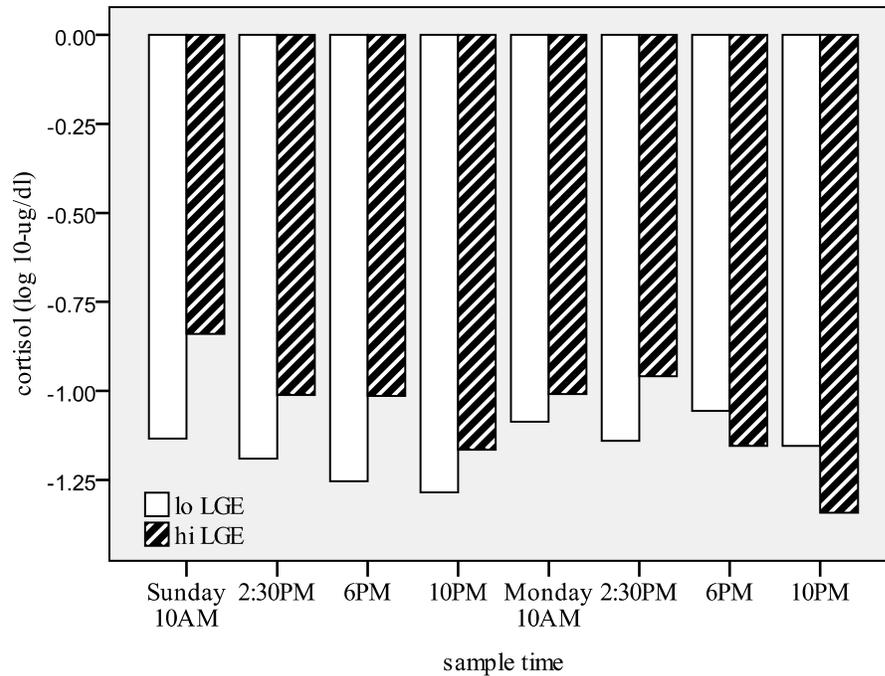
### *1.2 CORTISOL*

As expected, glossolalia was associated with a difference between high and low LGE groups in Sunday and Monday profiles, though differences were not significant (Table 7.3). It was predicted that both would have relatively high profiles on Sunday, given the stimulation of Sunday worship. While this is true for high LGEs, as illustrated in Figure 8.1, whose mean profile starts relatively high at 10 a.m., right before Sunday School, and increases at 6 p.m., right before evening Evangelical Service, low LGEs produced a relatively lower profile all-around, that decreases steadily throughout the day. This suggests that the low LGE group are relatively less active during services and that they potentially only go to Midday Service (an observation that definitely applies to many in this group, though quantitative data was not collected in this regard), which begins 11-11:30, skipping 10:15 Sunday School and 6:30 Evangelical Service.

It was predicted that significant glossolalia experiences over time would mediate stress levels, as indicated on a non-worship day. High LGEs do display a significantly lower aggregate on Monday relative to Sunday, a difference that is suggestively lower than that observed among the low LGE group (Table 7.5). The high LGE group produced a significantly lower 10 a.m. level on Monday relative to Sunday, but show an increase on Monday at 2:30 p.m. due to one outlier. This increase disappears when the outlier is

removed. The high LGE group also displayed a suggestively greater reduction relative to the low LGE group at 10 p.m. Differences between groups on Monday support the prediction but are not significant (Table 7.3).

Figure 8.1 Lifetime glossolalia experience and cortisol ( $\log_{10}$ — $\mu\text{g}/\text{dl}$ )



Surprisingly, no relationship was found between self-reported perceived stress as measured by the PSS-10 and cortisol in any of the models (Table 7.9, Table 7.10, and Table 7.11). This may be related to the Apostolic belief that God will take care of everything but that some suffering is required for deliverance. In other words, Apostolic habitus may mediate their practical evaluation of what they interpret and report as stressful, so that they are disposed to view things positively, though their hexis register the physiological signs of stress response, suggesting this aspect of habitus is not dually embodied. Consistent with this, the aspects of their lives they do report as more or less difficult to manage are predictive, including the number of children they have in their

care, the amount of social support they enjoy, the amount of physical exercise they get (this was the most predictive factor—most reported believing they should exercise more), and their general Christian religiosity.

As predicted, no dimensions of glossolalia were predictive of cortisol on Sunday (Table 7.9), but they were also not predictive on Monday (Table 7.10). However, the role that participants say faith has in their lives is validated by its predictive value on Sunday and Monday. In particular, informants say that their relationship with God is more important than religion in their lives, which is confirmed by this predictive value of faith maturity and not religiosity. Greater age and attending TAC were also significantly associated with cortisol. This is consistent with the relationship to faith maturity, as the officers and other elite and core members are more represent in the high LGE group than the low and are generally more mature in general, hence older. TAC is also a more generally active church, with much more physical movement around the church during service than ALT.

Years since 1st glossolalia experience (model 11) was suggestively predictive on the difference between Sunday and Monday (Table 7.11), though exercise was the most significant predictor across the four models. As expected, LGE and exercise were inversely related to the Sunday to Monday difference in cortisol levels, and years of experience was positively related. This latter finding seems counterintuitive except for the fact that it simply refers to years since first experience, and many in the low LGE group reported many years since their first experience though relatively few experiences.

The GEI, generated by considering the average intensity, frequency, and LGE, was not predictive in any models, nor were any other single dimensions of this index,

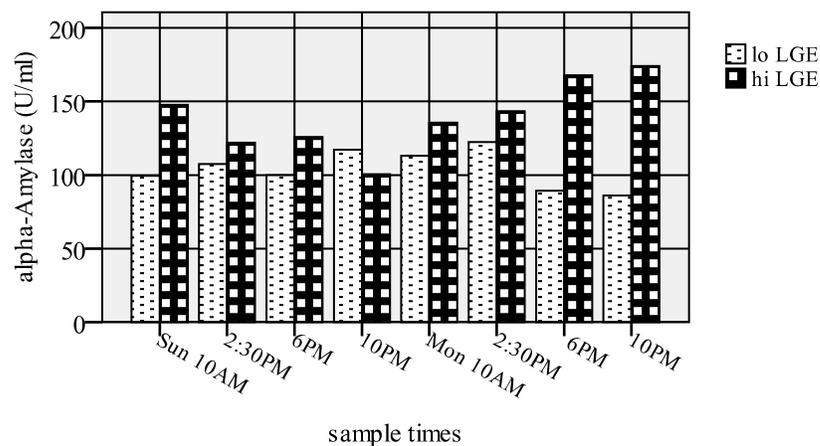
ability to recall experiences during glossolalia, ability to control physical body during glossolalia, or awareness of surroundings during glossolalia. The inverse relationship of years of experience to cortisol may have undermined the predictive value of the GEI.

These findings tentatively support other studies that have found a relationship between cortisol and composite religiosity/spirituality and to relationships between sub-domains of religious habitus and physiological stress indicators (Dedert, Studts, Weissbecker, Salmon, Banis, and Sephton 2004; Ironson, Solomon, Balbin, O'Cleirigh, George, Kumar, Larson, and Woods 2002; MacLean, Walton, Wenneberg, Levitsky, Mandarino, Waziri, Hillis, and Schneider 1997; Tartaro, Luecken, and Gunn 2005).

### 1.3 ALPHA-AMYLASE

Because there has been less research utilizing  $\alpha$ -Amylase as an indicator of the physiology of stress, there were no hypotheses for  $\alpha$ -Amylase distinct from those of cortisol. Hypotheses were formulated for the stress response, as measured by two proxies of its activity. The use of  $\alpha$ -Amylase in conjunction with cortisol was exploratory.

Figure 8.2 Lifetime glossolalia experience and  $\alpha$ -Amylase (U/ml)



As Figure 8.2 illustrates, significant differences were found between high and low

LGEs across Sunday and Monday, though these levels differ in several ways from cortisol (Figure 7.1). The Sunday profile for high LGEs is similar for both biochemicals, but for low LGEs there is an increase at 2:30 p.m., just after Midday Service, and again at 10 p.m., ostensibly just before going to bed. This 10 p.m. measure is in fact the highest level of the day among the low group. Among the high LGE group is an increase at 6 p.m., as with cortisol, right before the beginning of the evening service.

Monday levels for the low LGEs begins only slightly lower than for the Sunday 10 p.m. level. This does not suggest that they began their day with high sAA levels, however, as times were standardized across the sample rather than relying on participants to take a sample upon awakening as with most studies. Information on awakening was not collected, so this may represent several hours into the workday for some. Where the low group displayed a 6 p.m. increase in cortisol Monday, ostensibly when participants were arriving home from work, with  $\alpha$ -Amylase there is instead an elevation at 2:30 p.m. instead, followed by a decrease throughout the rest of the day. By contrast, the high LGEs produced a Monday profile that is higher than Sunday at every time except 10 a.m. and increases across the day instead of decreases. This increase in sAA across the cycle, as well as across the two days, was true for the sample as a whole and contrast diametrically with cortisol, as illustrated by Figure 7.1.

This diurnal increase in sAA is consistent with other studies in humans (Artino, Dragomir, Ionescu, Badita, Nita, Chitoi, Bellavía, Sanz, Chiarenza, Sereno, Vermouth, Jenzano, Brown, Mauriello, Rantonen, and Meurman 1998; Jenzano, Brown, and Mauriello 1987; Nater, Rohleder, Schlotz, Ehlert, and Kirschbaum 2007; Rantonen and Meurman 2000; Rohleder, Nater, Wolf, Ehlert, and Kirschbaum 2004) and rats (Bellavía,

Sanz, Chiarenza, Sereno, and Vermouth 1990; Dawes 1996), which indicate that it decreases within 60 minutes after awakening, then increases steadily throughout the rest of the day. This pattern and the lack of a relationship to cortisol levels from the same samples is consistent with cognitive behavioral therapist Urs Nater's study (2007), suggesting a relative independence from momentary stress but significant associations with chronic stress and mood. Nater and colleagues found higher sAA activity associated with positive mood and calmness, mediated by physical activity or smoking, and chronic stress. As only three participants in the low LGE group (one of whom was dropped due to confounding medication use) and none in the high group reported smoking, only physical activity is a potential mediator of sAA in this study.

As with cortisol, no glossolalia variables were predictive of  $\alpha$ -Amylase on Sunday (Table 7.12). Instead, social support and faith maturity were the most predictive factors. Surprisingly, social support is positively correlated with  $\alpha$ -Amylase, while faith maturity is inversely related as expected. However, given the dampening effect of physical activity on  $\alpha$ -Amylase (Nater, Rohleder, Schlotz, Ehlert, and Kirschbaum 2007), those most active in service and therefore potentially exhibiting lower Amylase measures would be elite and core members, who also appear to enjoy the most social support. Hours of sleep is also inversely suggestive, and this may be associated with the same phenomenon, since many of these members were extremely busy, often reporting 5-6 hours a sleep per night on average. Similarly, smoking is inversely suggestive, but as only three participants in the study reported smoking, it is not clearly meaningful.

Glossolalia is significantly predictive of  $\alpha$ -Amylase levels on Monday (Table 7.13) and Sunday to Monday (Table 7.14). Given the Nater et al. (2007) findings of a

relationship between  $\alpha$ -Amylase and positive mood and calmness, mediated by physical activity, the Monday/Sunday to Monday findings in this study are interpreted as indicating that those with more glossolalia experience and who experience it more frequently are calmer and experience a better positive mood on Monday, since Monday lacks the physical activity of service. Age is also suggestively associated with the Sunday to Monday (Table 7.14) difference in  $\alpha$ -Amylase, suggesting that greater age is also associated with more calmness and positive mood.

### *1.3.1 Embodying positive mood.*

These findings are extremely interesting in light of the buttressing effect Apostolic participants say worship has on the rest of their week. Given the dramatic difference between Sunday and Monday profiles in high LGEs, it suggests that through Apostolic habitus they may dually embody an overall more positive mood. Measures of chronic stress were not taken, but it is suspected that this affect would be evident across both days. The fact that the Sunday 10 p.m. measure is lower in the high LGE group (Table 7.3) may be related to the physical activity of two services. In fact, the purpose of Wednesday and Friday services to high LGEs is to tide them over until Sunday, as they say it is too long of a week to go without praising God. High LGEs typically attend services 3-4 times a week. On the other hand, many low LGEs are “Sunday Christians” (Williams 1984[1974]), though this implies that the distinction between high and low LGE is primarily one of elite/core versus supportive/marginal members. This is not an accurate assessment, as several in the low LGE group are recent converts who attend frequently and may already or soon be among those categorized as core, but since they have not yet or just recently received the Holy Ghost, they have not had time to accrue

the lifetime experiences and depth of socialization of the high group participants.

Alpha-Amylase data also supports Newberg's findings that glossolalia is associated with activity in the thalamus (2006), as discussed in chapter 4 ("2.4.3 Cultural neurophenomenology of *glossolalia*"). As the depot for integrating sensory information into the cerebral cortex, it may be the thalamus that is at least partially implicated in dissociative filtering of negative information, to which this system is particularly sensitive. Follow-up research measuring chronic stress and mood in relation to glossolalia and  $\alpha$ -Amylase is warranted.

Glossolalia (along with age) was significantly predictive of  $\alpha$ -Amylase in multiple models in terms of both lifetime experience and frequency. It was suggestive of cortisol in terms of lifetime experiences and years since first experience. Yet GEI, the rate constructed using LGE, years, and frequency, as well as duration, was not predictive of cortisol or  $\alpha$ -Amylase. This suggests that the most salient feature of glossolalia is the overall experience, rather than any particular dimension or intensity. It is also consistent with the literature on meditation, which suggests that regular practice is associated with reduced stress and improved health but that intensive meditation, such as by those training to be meditation instructors, is not necessary for improved health and can sometimes even have deleterious affects (Otis 1984). Improvements in future research methodology may clarify some of these issues, specifically in terms of the following study limitations.

## *2. LIMITATIONS*

As a study that crossed the disciplinary lines of biological anthropology, ethnography, and psychology, clearly several compromises had to be made. Therefore, the results of

this study should be cautiously interpreted with respect to the following limitations.

### *2.1 SAMPLING*

The biggest limitation of this study is the limited sample size. It is a sample of 55, after removal of participants reporting confounding medications, spread across two churches. Additionally, there are fewer cortisol than sAA observations and some missing questionnaire observations, as some data has yet to be analyzed.

The study tested Apostolic stress response in relation to glossolalia, which hypothetically is the same in similar churches, but as two of the regression models indicate (Table 7.12), there was some variation in participants between the two churches. The limited size of this sample therefore reduces the external validity of the data.

The study examined only two groups of Apostolics in a limited geographic area and should not be generalized to all Pentecostals or even, barring future comparative study, to all Apostolics. Also, the study compared two Apostolic groups that both contain glossolalists. There may be a distinctive, dually embodying neurophenomenological effect of baptism of the Spirit that renders a greater difference between glossolalists and non-glossolalists than between high and low LGEs. Such a difference may also translate into a difference that influences the separation into elite/core and supportive/marginal grouping, given enough time for new converts to be deeply socialized, but there was not a large enough sample of non-glossolalists in this study to make such a comparison. The objective of an invested Apostolic member is to receive the gift of tongues; those supportive members not interested in receiving tongues may also have been less interested in participating in this study and, as was expressed by some of the brethren, seeing their investment in God scientifically validated. This highlights that there is

insufficient information about the “Sunday Christians” and potential bias in those who were sampled in this study. Future research should aim to compare Apostolics who differ more distinctively in this manner and should include non-glossolalic groups that are also not Apostolic (non-Pentecostal Christians or non-Christians, for example) to determine the effects of attending an Apostolic church alone.

## *2.2 ETHNOGRAPHY*

Additionally, the ethnographic investigation and analysis was necessarily limited. Due to time and other resource constraints, a variation of ethnographic rapid assessment was used in lieu of more in-depth data collection. For instance, while glossolalia is clearly a defining feature of Apostolic Pentecostalism, it is less clear how important it is in the habitus of individual Apostolics. The data collected indicates that glossolalia is merely the tip of the iceberg and that, in fact, it can even be a superficial distraction, especially to outsiders, from what is really important, which is the personal relationship with God. In fact, this is the problem the apostle Paul, himself a glossolalists, observed among the Corinthians, which led him to recommend the cessation of tongue-speaking (Samarin 1972:14-15). Similarly, the brethren clearly do not conceive of glossolalia as a stress-reducer per se, but they do explicitly speak of the stress-reducing effects of their relationships with God. I have heard as much in sermons, testimonials, and from numerous participants in the process of recruiting and explaining the objectives of this study. Yet the effort to investigate personal experiences of individual conceptions of stress and coping strategies was merely preliminary and conducted in the context of asking how and why informants came to become Pentecostal. There are clearly cultural differences in perceptions of stress, as suggested by comments that Jamaicans in the

United States do not feel they need God as much as they do in Jamaica, as well as personal differences. Future research will investigate these intersections of habitus and embodiment more thoroughly.

### *2.3 CODING*

As suggested, it is possible that at least some degree of difference between high and low LGE groups is attributable to duration of membership, which presumably correlates positively with depth of socialization and embodiment and degree of cultural competence. Initially, the study design was going to compare new initiates to longer-standing members. But there were several problems with this approach. ‘New’ became difficult to define, insofar as within the churches it means anyone joining and seeking to be baptized in Jesus’ Name, whether they are fresh off the street, so to speak, a child who has matured enough to make the conscious choice to be baptized in Jesus’ Name, or a convert from another form of Christianity or even a Trinitarian denomination. For instance, one “new” member during the time I was there was a Trinitarian evangelist who converted to Apostolic Pentecostalism and was rebaptized and immediately became a church official and elder, though he is still a relatively young man. Another, a young woman from Barbados, raised Baptist, married into the congregation, converted and was baptized, then along with her husband, who was already a core member, became a church officer. In the first case, the individual has spoken in tongues countless times, weekly if not daily, while in the second case, the woman received the Holy Spirit only a few months before participating in the study but has by now, over a year later, done so perhaps hundreds of times. Then there many cases of individuals who have been in the church for years and only spoken in tongues a few times ever or still not received the

Holy Ghost, whether they only attend Sundays or several times a week. One such individual is a member of one of the core families and is integrally involved and shocked me in disclosing that he had not yet received the Holy Spirit.

To account for these problems, I sought instead to compare people in term of faith maturity. To ensure that faith maturity is not a confounder of glossolalia in Apostolic practice, correlation testing was conducting and any variables that significantly correlated with glossolalia variables were removed. As indicated in Table 7.7, faith maturity and glossolalia were not correlated. Nevertheless, it is still possible that, were individuals to be isolated as in some way unsocialized with regard to religion, not just Apostolic or even Pentecostal, compared to even just supportive and marginal categories, there might be a difference that confounds glossolalia experience. Alternatively, a control group of non-Pentecostals but religious and another of non-religious Jamaicans in Poughkeepsie may be a more reasonable means of making this comparison. I pursued this type of information through qualitative interviews, but these interviews have not yet been conducted with all participants, which is also among future research plans. Additionally, given the limitations of ethnographic rapid assessment, for purposes of cross-cultural comparison, it might be expeditious to include items related to duration and membership and religious background in the glossolalia experiences questionnaire.

#### *2.4 CONTROLS*

Certain data was not collected as it was not initially deemed relevant to the research hypotheses. Occupational and race data were among these factors not collected. Though ethnic composition was an initial interest during preliminary research, no quantitative data regarding ethnicity or race was collected. In considering the variation found based

on church attended, it is possible that race or ethnicity played a part. Occupational data was also not collected, though occupation has a well-established relationship to stress and should have been used to control for the “normal everyday stress” on Monday.

### *2.5 COMPLIANCE*

Several compromises were made to improve compliance, such as reducing the number of questionnaires. Thus, information that would have been useful but was not collected so as not to overburden participants relates to diet, physical activity (aside from exercise), times of awakening, occupation, number of services attended per week (as opposed to number of services per year, to which participants tended to answer “a lot”; alternatively, a scale could have been provided), chronic stress, and mood. These factors may affect biochemistry but did not pertain directly to the central objective of this study and were therefore sacrificed.

Finally, compliance was maintained by setting the self-sampling times rather than the sampling intervals and texting or calling participants at those times to remind them. While this proved relatively effective, there is no control for the time of awakening and, therefore, the diurnal variability of individual cycles. Additionally, a few participants reported taking samples at times later than specified, and only a few actually recorded the times of these delayed samples. A study of salivary cortisol sampling compliance (Broderick, Arnold, Kudielka, and Kirschbaum 2004) found participant self-reports of compliance vary from 60-92%. An objective verification of compliance using electronic monitoring caps on saliva swab containers that register the time and date when the cap is removed to take a sample in participants unaware of the true purpose of the caps indicated actual compliance rates of 11-62% (Broderick, Arnold, Kudielka, and

Kirschbaum 2004). On the other hand, participants made aware that these caps record sampling times produced consistent self-report and objective compliance rates of 93%. The problem with these electronic monitoring devices in a study of this type is expense, as several participants lost or failed to return kits (one participant actually lost four kits and was ultimately not given another one because it was apparent that she had become well along in pregnancy). Withholding the compensation for participation would not offset the cost of losing these devices, and taking measures to retain them by more closely monitoring participants would likely result in reduced participation. Therefore, if participants are restricted to a limited number of congregations, as is the best way to reduce undesired heterogeneity, a smaller sample size might be the result. Nevertheless, given the issue of controlling for interpersonal variability in diurnal biochemistry, future research should find a way to make use of such objective monitoring.

Future research will attempt to refine methodology to avoid these sampling, ethnographic, coding, and compliance issues in order to improve external validity of such research. These limitations do not prevent conclusions from being drawn with regard to stress and health, as outlined in the following section.

### *3. RELATIONSHIP TO HEALTH*

The data from this study do not prove that high or low LGE are healthier than one another or that glossolalia in fact transforms body hexis. In clinical or epidemiologic terms, health is roughly defined as ‘free from disease,’ whereas in anthropology it is synonymous with well-being. Both ‘health’ and ‘well-being’ can be positive or negative but are still relatively vague. Dressler points out that health “can be understood, in part, as the intersection of meaning and structure” (2007b:30). This indicates that it is both

individually constructed (as suggested by use of terms like “perceived” or “self-reported” when referring to certain measures) and structurally constrained, such as by SES, education, or doxa.

As such, every participant in the study save those reporting medications relating to cancer, cardiovascular irregularities, or diabetes might be considered healthy, short of conducting an actual epidemiological survey or soliciting self-reports regarding health (another topic for future research). Other studies of the influences of dissociative practices on health utilize a clinical definition of health. These include studies of meditation (Chalmers, Clements, Schenkluhn, and Weinless 1990; Grossman, Niemann, Schmidt, and Walach 2004; Orme-Johnson and Farrow 1977; Wallace, Orme-Johnson, and Dillbeck 1990), hypnosis (Flory, Salazar, and Lang 2007), and yoga (Bonura, Aloe, Becker, and Tenebaum 2007, unpublished manuscript cited in Bonura 2007) which are practices derived from religio-cultural settings for use in secular health contexts. This study sought to discern if a similar connection exists in a religious setting. While the study did not specifically test epidemiologic or clinical health outcomes, the data indirectly support this connection. The transformation embodied as individuals internalize the Apostolic habitus is evident in the differences between the LGE groups on Monday (Table 7.4) and linear regression models of  $\alpha$ -Amylase for Monday (Table 7.13) for the difference between Sunday and Monday (Table 7.14) This supports the concept as habitus as more than mere praxis; it is also attitude, temperament, and sociality, among other things. Thus, the totality of the person is affected. Particularly for high LGE glossolalists, habitus is a “unifying principle” of a “total repertoire of social practices” (Csordas 1997b:10) that affects them on a total or holistic health level. Thus, as will be

discussed more in the following sections, expectation of health is antecedent to and structurally informs the manifestation of glossolalia and validates behavior supposed to continue its manifestation. What Apostolics *know*, *think*, and *do* influences body hexis.

What is most strongly suggestive from this data is the indication that habitus of intensive glossolalia is influential in two dimensions of hexis, stress response and positive mood. This affect on stress response is suggested by the lower levels of cortisol among the high LGE group on Monday (Figure 8.1) and by the higher level of  $\alpha$ -Amylase among the high LGE group on Monday (Table 7.4 and Figure 8.2) and the predictive value of glossolalia on Monday (Table 7.13) and the difference between Sunday and Monday (Table 7.14). Like health, stress and mood are active conditions of motor functions that are structurally dependent on expectations and tend to be continued when those expectations are validated by predicted outcomes. Thus, expectations of stress reduction and elevated mood, as predicted by conversations, testimonials, and sermons of other Apostolics, tend to co-occur in association with glossolalia and thereby encourage individuals to continue such behavior. From a diathesis-stress perspective, this social dialectic about health and stress in relation to habitual behaviors is dually embodied in those who have accepted the moral code (and this acceptance is implicit—i.e., also embodied—rather than tacit), predisposing them to behave in ways that will manifest glossolalia and thereby achieve said goals. The significance to health is synergistic, as reduced stress, increased positive mood, and validation by one's social group are all strongly associated with disease reduction (Aldwin 2007; Sapolsky 1998). This therefore suggests that the high LGE group is in fact healthier than the low group, barring a discrete, mechanistic measure of health. Rather than define health as the

absence of disease, a bioculturally relative definition for this sample of Apostolics is that health is the dually embodied idealization of Jesus.

Health is thereby embodied through practicing Apostolic prescriptions for living, which include the reduction of risky behavior, displaying a positive attitude, not worrying about things out of one's control, practicing Christian charity, and having an experiential relationship with God. The following section discusses the relevance of this data to the typology devised through preliminary qualitative research and that informed the quantitative research design.

#### *4. RELEVANCE TO GLOSSOLALIA TYPOLOGY*

As indicated in chapter 6, participants who had experienced glossolalia by the time of the study primarily reported experiencing HGG sub-type, so grouping was not done with respect to the glossolalia typology. However, it is important to reiterate the possible presence of iatrogenic or factitious sub-types in the sample and discuss the quantitative data with respect to these sub-types where relevant.

##### *4.1 HOLY GHOST GLOSSOLALIA.*

As indicated in Figure 5.1 and Table 5.2, the pinnacle type is true or purely divine glossolalia. This is the type of glossolalia displayed by most participants who have experienced glossolalia and likely everyone in the high LGE group. There are two types of HGG, as distinguished by Grady and Loewenthal (1997) and outlined in Table 8.1. Both are associated with Spiritual baptism. While HGG can be dramatic and active, it can also flow congruently and gently with an individual's personality so that entering and exiting trance may be rapid, subtle, and part of a normal course of worship. This appears to be increasingly the case with experience as affirmed by Goodman (1972; 1988).

Similar observations have been made with regard to other forms of dissociative trance (Bourguignon 1976; Ross 1997).

Table 8.1 Characteristics of two forms of Holy Ghost glossolalia

Calm	Excited
Calm	Excited
Frequent (daily or several times weekly)	Occasional (weekly or less)
Usually/often in private	Usually/only in public
Mundane settings	Religious settings
Self-aware while “speaking”	Not self-aware/dissociation/altered state of consciousness
Can attend to other claims on attention	Cannot attend to other claims on attention

\*Adapted from Grady and Loewenthal (1997)

Phenomenologically, displays of HGG can range from a short phrase in the midst of a sermon or testimonial (calm sub-type) to ecstatic performances involving groups of people moving with eyes closed about the church (excited sub-type). Instantiations of calm HGG are subtle, quick, and easily missed unless one is listening for them, though they are as often accompanied by a noticeable physical spasm of some kind, such as a lateral movement of the head or raising of the arms and shoulders. It is questionable whether calm sub-type accompanies a trance. Instead, they seem to be emotionally dissociative moments attributed to spiritual contact. This perspective is echoed by Samarin who argues that

the acquisition of charismatic or Pentecostal glossolalia is *sometimes* associated with *some* degree of altered state of consciousness, that this *occasionally* involves motor activity that is involuntary or, *rarely*, a complete loss of consciousness, and that in any case subsequent use of glossolalia (that is, after the initial experience) is *most often independent* of dissociative phenomena. [1972:33]

Samarin’s argument is based on the typical categorical commutation of dissociation and trance, rather than the psychological and affective distinctions, respectively, utilized in this study (see chapter 2). Furthermore, Samarin’s conclusion is based on the study of numerous types of Pentecostal glossolalia, not just Apostolics. Apostolics, as discussed

in chapter 4, place a greater emphasis on glossolalia than many other denominations, so his sample doubtless includes many degrees of this emphasis and experience. But Samarin's evaluation also applies to some extent to Apostolics, as it is predominantly the more experienced who report calm sub-type experiences, and it is the supportive members or those recently experiencing Spiritual baptism who display the exaggerated physical trance behaviors of excited sub-type. His criticism of Goodman in this respect, who evaluated glossolalia by definition as "an artifact of trance" (1969:238), illustrates the need for a cogent typology and stricter definitions of dissociation and trance.

Excited sub-type HGG appears to, by definition, involve an affected trance state. There are varying degrees of memory and time loss. Informants report feeling exhausted but tranquil after excited episodes. They often also appear exhausted. They are frequently covered in sweat. Some may slump down in a chair and appear to have practically collapsed. Such overt signs are useful in that initial HGG is affirmed by being witnessed and validated by the congregation. Additionally, the physical and emotional exertion of excited sub-type hypothetically causes the greatest stress relief in the short term, as reported by participants in both the low and high LGE groups; but continual practice of both HGG sub-types over a lifetime is likely to embody the greatest stress reduction of all glossolalia types, as supported by the current study.

It is possible such glossolalia influences stress reduction in several ways. It is commonly stated in sermons that glossolalia alone is not enough, that it signifies a lifestyle and spiritual path. The transformation in lifestyle that reduces stress and invokes God is inextricably associated with health, thus they are all part of the nexus of by which habitus influences hexis. By embodying the idealization of Jesus, they are embodying

the cultural ideal of health. “Healing...is salvation. And this is a change in consciousness, in sense of self and the meaning of life” (Bourguignon 2003:14). Pentecostal faith healing is tied to this same process. The spiritual path to health, including reduced stress, is part of scriptural teachings. Informants point out and preachers sermonize that while psychologists may afford people some important insights and assistance, their knowledge is in the bible and has been known for thousands of years.

Another likely route of stress moderation through HGG is physical activity. Excited HGG involves much exaggerated physical movement in three-dimensional space and throughout a room. As indicated in the wrong Holy Ghost incident, individuals move rapidly around the church, eyes squeezed tightly shut, arms waving, jumping or stomping feet. This is typical in services of one of the two study churches, whereas the other is more reserved about moving around the church but exert themselves in a more circumscribed personal space and at the altar, especially with regard to highly affected emotionality. Physical activity exerts a dampening affect on  $\alpha$ -Amylase, which may explain why Amylase levels decrease throughout the day on Sunday among the high LGE group (Table 7.4 and Figure 8.2) but rise on Monday. Exercise also exerts a well documented positive influence on stress proteins (Locke and Noble 2002). An energetics analysis of Apostolic practice—and religious ritual in general—is therefore warranted to determine the influence of this highly physical worship.

HGG thereby influences stress reduction directly through the dissociative state, as a reflection of other stress-reducing lifestyle changes, and through physical activity. Backslider glossolalia also exhibits the dissociative state and physical activity.

### 3.2.2 *Backslider (Aware Demonic)*.

In the wrong Holy Ghost incident in chapter 5, Richie was possessed of the demonic glossolalia of a backslider. This assessment is based on interviews with several informants, including Richie. Backsliders have received the Holy Ghost but left the church temporarily for a life of sin. Once received, according to informants, the Holy Ghost is always there, but every time they turn away they are beset by seven demons more wicked than before (Matthew 12:45 [KJV]). This is the emic explanation for the high drama and difficulty of backslider exorcisms. Backslider glossolalia, which Csordas also refers to as “demonic crisis” (1997b:229), occurs among those who are aware of their transgressions and have returned to the church to renounce their sins, hence the sub-label “aware demonic.” The brethren consider backsliders to be in some ways under the spell of the Devil or other demons of selfishness. Csordas points out that deliverance from demons in the 20<sup>th</sup> century practices of charismatics is a highly elaborated system influenced by contemporary psychology, rather than the purely sin-oriented demonology of the Renaissance (1997b:181). Pentecostal demonologists Frank and Ida Mae Hammond outline no less than 53 demons, ranging from the “root or master spirit” “bitterness” to “schizophrenia” to “addictive and compulsive” to “occult” and “false religions” (1973:113-115). Csordas has noted that the Charismatic healing system consists of a combination of ethnopsychological (suggesting a cultural relativity to the demons encountered in respective cultures), cosmological, and ritual (1997b:185-187). While the demonology of Apostolic practice was not investigated in this study, the hesitancy with which the brethren assess backsliders and dual attribution to demons and the self suggests similar relativity and uncertainty. Future research with regard to this typology will need to more carefully pursue this aspect of backslider glossolalia.

Given the results of the current study, backslider glossolalia does not confer the same degree of stress relief as HGG, as the few reported backsliders in the sample were in the low LGE group. But backsliders do possibly achieve some stress reduction in two similar areas as HGG. Backslider glossolalia may facilitate emotional expression that is part of the process of healing. This public embodiment of demons is a cathartic act, bringing them into a public forum, exposing them, and asking for help in being rid of them, which stimulates needed social support from the congregation. Csordas refers to the demonic crisis as originating “in the *preobjective* experiences of...affliction. That is, the crisis is an affliction indicating the need for profound spiritual and emotional healing” (1997b:229). The *preobjective* refers to Merleau-Ponty’s position that the personal cannot be objectified irrespective of the sociocultural and that there can be no mind/body schism, because any experience of either the mind or body is filtered through their combined relationship. Additionally, this violent and dramatic display is extremely physical, which is neither mind nor body but the entire integrated physicality, which only happens because of the historical precedents of other backsliders and the meaning it implies in the context of the Apostolic ceremony. For instance, backsliders do not manifest these glossolalic demons outside the church, though the demons are active throughout their lives. Backsliders are visibly shaken and fatigued when they come out of trance. This may produce an endorphin response that, in addition to the spiritual experience and social support, creates the positive feedback loop in the body hexis that motivates such individuals to maintain the physical presence of God in their life (and body) (as illustrated in chapter 1, Figure 1.1).

Among Apostolics, backslider glossolalia was frequent enough that I could readily

refer to such displays and the brethren knew exactly to what I referred and, generally, to whom on the other hand, whereas among Catholic Charismatics these demonic crises are rare (Csordas 1997b:229). What is outright interpreted as solely the presence of Satan is less common. Informants do not discretely concord glossolalia to any typologies; rather, the tendency is to attribute such episodes to some combination of self and demon. Therefore, individuals are never fully absolved from responsibility for their behavior, even if considered under the influence of the Devil. This may be partly due to the habitus of average Apostolics, who have not internalized the Pentecostal demonological hierarchy, but in fact likely have more familiarity with these so-called “demons” as psychological concepts and refer to them as such. This, however, needs to be confirmed through additional research.

Iatrogenic glossolalia also merits further research, as only one participant reported experiencing what he thought was tongues but was not supported by the community.

### *3.2.3 Iatrogenic (Unaware Demonic).*

Iatrogenic glossolalia is false or demonic tongues but which perpetrators are unaware is false and believe to be HGG. Iatrogenesis means brought forth by a healer (Valenstein 1986) and in this case refers not to an induction by a physician per se, as with iatrogenic DID for example, but through the overzealous enthusiasm of church officials and others to help and encourage others to receive the Holy Ghost. Brethren who have legitimately received HGG, when laying on hands, are considered vessels of God for healing. Among those wishing to be accepted members and receive the benefits of said membership, the requirement to speak in tongues may initially actually produce stress rather than alleviate it, especially when tarrying at the altar. This tarrying can induce a demonstrative trance

with, potentially, some of the same stress-relieving outcomes as HGG, but as previously indicated, unless tongues are witnessed by other members (ostensibly, core or elite members, though this has not been expressly specified) it is not Spiritual baptism. It is this tarrying at the altar and effort to dissociate and dissociating in ways that does not involve glossolalia may influence some stress reduction and mood enhancement. It is possible that iatrogenic cases exist among those who reported only a few glossolalia experiences over many years. Glossolalia supported and validated by the community appears to occur more, as this support reinforces behaviors leading to glossolalia, as depicted in the a priori model in chapter 1 (Figure 1.1); whereas those occurrences that are unsupported may produce a negative feedback in which the person is less inclined to continue Apostolic behavior, as their payoff is not what they had hoped or expected.

Those displaying iatrogenic glossolalia are essentially naïve, whereas factitious glossolalists are among the only type that might be considered malicious or who do not at base accept the Apostolic habitus. There were no reports of factitious glossolalia in the current study, nor have I ever knowingly observed it. It is included for the sake of presenting the complete model but is only discussed with relation to future research.

#### *3.2.4 Factitious.*

Factitious or fake glossolalia can be perpetrated by anyone who has observed and practiced often enough. However, getting away with faking is less easy because of the social and public requirement for receiving the Holy Ghost, unless someone has legitimately received the Holy Ghost in the past and fakes on subsequent occasions (as in the documentary *Marjoe* [Kernochan, Smith, and Docurama 1972]). Informants point out that, more or less, ‘you just know’ when a person's Holy Ghost is not legitimate. There is

no conscious formula for such discernment, but perhaps a stranger receiving the Holy Ghost is more suspect because the person is not among familiars who can validate his or her spiritual path and bear witness for future reference. Among familiars there will be awareness of a person's habitus and if a person is battling demons or ready to receive the Holy Ghost. This awareness is not, however, necessarily conscious. Additionally, as Navarro points out, there are aspects of the trance that accompany glossolalia that are less easy to fake than the vocalizations themselves "such as irregular or heavy breathing, highly stereotyped and repetitive moments, abundant sweat, in other words, an evident state of excitement" (1998:355).

HGG is the preeminent form of glossolalia toward which Apostolics strive, yet along the way they may experience backslider, iatrogenic, and even factitious sub-types. Only HGG was sufficiently represented in this study's sample to discuss in any detail, but the question remains as to the significance on hexis of stress and dissociation of these other forms of Apostolic embodiment. Future research will focus on this problem.

##### *5. SUMMARY*

The results of the current study support the hypothesis that HGG in the context of Apostolic practice is stress-reducing. Additionally, they suggest that HGG is mood-enhancing, which may directly effect stress-reduction or merely be a co-product of glossolalia influence and likely effect it indirectly. This chapter also discussed the results in relation to the glossolalia typology outlined in chapter 5.

It appears important to observe the differences in affective states of glossolalia and learn through further observation, participation, and interviews what psychological differences might underlie these trance appearances—in other words, what different

modes of dissociation or functions are related to them. Neuroendocrine analyses of glossolalia types may facilitate discovery of the physiology of each state and any differences that may exist. This process will require much more work, as spiritual progress constitutes a spectrum of behavior, not a rigid typology, and therefore requires observation in many churches throughout the world to improve and substantiate this model. Simple models provide necessary heuristic value to stimulate such research.

It is important to reiterate that glossolalia research must include iatrogenic and factitious forms, as all forms are potentially related to possible psychosocial needs or desires and busy intersections in the course of embodied socialization. Such individuals are possibly seeking culturo-spiritual remediation and represent a stage of cognitive transition that is eminently salient. While this study tested the specific influences of glossolalia on stress response, it is part of a larger theoretical framework that positions dissociation as a fundamental aspect of human psyche. The following chapter discusses that theory and the implication of this study.

## 9. IMPLICATIONS FOR HUMAN CONSCIOUSNESS

The results of the current study provide tentative support for stress-reducing and mood-enhancing effects of active religiosity and the particular sub-domain of glossolalia.

Given the cross-cultural and historical ubiquity of states of dissociation like glossolalia, it has been theorized that dissociation has played an evolutionary role in the development of human consciousness though this role has not been clearly outlined.

The fundamental aspects of human consciousness—or, in some cases, of “higher-order consciousness” (Keenan, Rubio, Racioppi, Johnson, and Barnacz 2005)—are self-awareness (SA) and theory of mind (ToM). It has been proposed that these capacities enable higher-order activities distinctive of social intelligence, such as purposeful deceit (Alexander 1989; Humphrey 1976; Keenan, Rubio, Racioppi, Johnson, and Barnacz 2005). Investigators have also suggested the importance of other psychosocial phenomena in the evolution of human cognitive processes—e.g., hypnotizability (McClenon 1997; 2002), ASC (Winkelman 2002), and self-deceit (Alexander 1989; Humphrey 1976; Trivers 2000) or “denial-like processes” (Stefano and Fricchione 1995), phenomena widely held to be part of the continuum of dissociative experiences, as outlined in previous chapters. In fact, dissociation, inclusive of all these forms, should be included in models of human consciousness, as will be discussed. Dissociation has hypothetically been elaborated through evolutionary processes to dampen consciousness or delimit social intelligence because of the inherent stress of knowledge and awareness.

SA “is the ability to reflect on one’s own mental state and the capacity to regard the self as a different entity from others” (Keenan, Gallup, and Falk 2003:5). ToM<sup>10</sup> is the “ability to make accurate inferences about mental states in others” including the

“ability to take into account what other individuals may know, want, or intend to do” (Gallup, Anderson, and Platek 2003:147). Evolutionary psychologist Gordon Gallup has made the case that SA presupposes ToM (2003). I would extend this to argue that SA is too costly alone and only appears to facilitate ToM, which is more advantageous. Dissociation is elaborated to minimize the costs of SA in species possessing ToM. The following section outlines the costs and benefits of SA to make the case that dissociation is an elaborated function of the psyche to limit the costs of consciousness.

### *1. SELF-AWARENESS FOR AWARENESS OF OTHERS' AWARENESS*

There are seemingly several benefits to stand-alone SA, as I have outlined in Table 9.1 Benefits and costs of self-awareness, but there are more costs. Self-recognizing members of a species may have gained a slight reproductive advantage by making themselves look healthier or more attractive, but, given the social grooming proclivities of primates (Keenan, Gallup, and Falk 2003). SA also facilitates cognitive scenario-building. By imagining themselves in various contingencies, people save the time, energy, resources, and potentially avoid danger incurred through trial and error of every action. It is also possible that SA alone could engender pride, which, evolutionary cognitive neuroscientist Julian Keenan points out, “must have been a great motivator in the development of ideas, tools, and strategies, and we imagine that early leaders might have maintained their rule with a hefty measure of pride” (2003:241). Even misplaced pride, under such circumstances, might have been beneficial. Positive self-deception can project attractive confidence and enhance one’s reproductive success, even if it turns out later to have been facile. And probably one of the most valuable abilities suggested by SA is self-control, or the ability to act contrary to impulses or automatic inclinations (Leary and Buttermore

2003), though it is doubtful an individual would be able to do so without the motivation to take the perspective of those others who might be affected by such an impulse.

*Table 9.1 Benefits and costs of self-awareness*

Benefits	Costs
Self-grooming	Self-isolation
Scenario-building	Paralysis of analysis
Pride	Forecast inaccuracy
Positive misperception of self	Negative misperception of self
Self-control	Self-aggrandizement/low self-esteem
	Resentment
	Egotism
	Envy
	Guilt/shame

On the other hand, a perception of self without a ToM might lead to a sense of isolation. Being aware of oneself but not being able to imagine that others might be having a similar experience could lead an individual to feel self-consciously different. A recent functional magnetic resonance imaging (fMRI) study of children (ages 8-17) with autism spectrum disorders found activation in the right premotor/prefrontal cortex when viewing images of self but not others, whereas normally developing controls displayed activation in this region when viewing both self and others (Uddin, Davies, Scott, Zaidel, Bookheimer, Iacoboni, and Dapretto 2008). Given the large body of data supporting ToM impairment in autism spectrum disorders, this suggests that some forms autism may represent SA without ToM. Supporting this, psychiatrist Leo Kanner (1968) conceived of autism as complete self-focus. Developmental psychologist Uta Frith (2003) sees autism as affected by the sense of self, for better and worse. The degree of impairment in the PFC, where both SA and ToM are believed to be neurologically located, may determine where individuals fall on the autism spectrum and the degree to which they possess a sense of self and, consequently, ToM.

To the degree that autism focuses on self to the exclusion of ToM—or, as

developmental psychologist Simon Baron-Cohen (1997) terms it, “mindblindness”—this could contribute to what Keenan calls the “paralysis of analysis” (2003:240), or the casting of oneself in so many possible contingencies or scenarios that one freezes up and is unable to act effectively. This type of scenario should be familiar to anyone accustomed to playing a musical instrument or competitive athletics, among other things, and is essentially the antithesis of embodiment. Once a musician learns a song or an athlete a skill, it becomes second-nature or embodied. The behavioral repertoire necessary to complete it can be accomplished without direct attentive awareness. In fact, drawing one’s conscious attention to the actions being performed—the fingers that go to a fret and string when playing guitar for instance—often interrupts the automatic memory of the body and causes one to freeze up or make a mistake.

Another type of mistake caused by overactive SA is forecast inaccuracy. Rather than freezing up, this is acting on the wrong contingency or forecast about the future, whether believing things will turn out far greater or worse than the reality of the situation suggests. SA in such cases is an impediment requiring more neural hardware than it is worth, as it would be to any organism lacking the additional capacity to extrapolate from SA to put themselves in the mind of others.

Furthermore, such self-consciousness could also hamper an organism in another way. Whereas positive self-deception may enhance reproductive fitness, negative self-deception may impede it. An organism that undervalues self may fail to take advantage of reproductive opportunities when present. By the same token, if positive self-deception is useful in fooling others to gain reproductive opportunities, having a realistic view of self can have the same negative affect if one is of low to average quality. A

preponderance of data supports the association of self-focus with depression and negative self-evaluation (Mor and Winqvist 2002). Furthermore, public self-consciousness, which requires ToM, is more associated with social anxiety. Therefore, even realistic SA can contribute reproduction-impeding self-aggrandizement and low self-esteem.

The problems with envy, resentment, egotism, guilt, and shame hardly need to be explained, as their negative dimensions are biblical. Envy signals low self-esteem, whether due to negative misperception of self or realistic perception of self. And resentment, as Keenan (2003) points out, is not simply anger or anxiety, which do not require a sense of self, but the “re-feeling” or replaying of a negative sentiment over and over again in awareness, ruminating on it. Self-focused rumination scores even higher on the Beck Depression Index than non-ruminating private self-consciousness (Mor and Winqvist 2002).

The opposite of the positive motivation of pride is the overweening pride of egotism, which rather than attract and inspire, tends to aggravate and repel others. Guilt and shame are internalized authorities, be they cultural or individual. For social species, these are by and large beneficial to protect an individual in social settings from dangerously overstepping mores. But as Keenan (2003) points out, while guilt and shame largely preclude large-scale sexual violence and rape, they simultaneously reduce the chances a male will be able to successfully pass his genes. Similarly, among many species a usurper male will kill the offspring sired by his predecessor to bring females into estrus to increase his own reproductive advantage. Among humans, there is a higher rate of abuse by males toward step-children than toward biological children and toward women (and directed toward the abdomen) of women suspected of cuckoldry (Burch and

Gallup 2000; 2004). However, sound though this line of reasoning may be regarding the evolutionary disadvantages of guilt and shame vis-à-vis the selfish gene, these emotions are inherently social and perhaps should not be included, as they probably could not exist in the absence of ToM.

The costs of SA outweigh the benefits, though some costs are arguably not independent of ToM. If ToM presupposes SA, as Gallup et al. (2003) argue, any species displaying ToM should possess SA. If SA is too expensive to be maintained without the advantage of ToM, as I argue, any species displaying SA also possesses ToM. The following section presents some of the evidence for SA in non-human primates.

#### *1.1 SELF-AWARENESS IN NON-HUMAN PRIMATES*

SA has been inferred in non-human primates by demonstrating their ability to recognize themselves. The seminal model for self-recognition in animal models is the mirror self-recognition test developed by evolutionary psychologist Gordon Gallup, Jr. (1970). In the original experiment, chimpanzees and monkeys were exposed to a mirror by allowing them to play, eat, and otherwise behave normally in front of it for ten days. Initially, monkeys and apes behaved agonistically toward their reflections (Anderson 1984; 1994; Anderson and Gallup 1999; 1970; Gallup 1988), as though encountering a conspecific. After habituation they were anesthetized, and marks were placed on their heads that they could only see in a mirror. Upon awakening, they had no access to a mirror and displayed no indication that they were aware of the marks. When presented with the mirror, chimpanzees touched the marks on their heads, not the mirror, and then examined their hands, suggesting they were aware of the marks as a change in self. The same was not true of the monkeys, which displayed no mark-directed activities. Furthermore, a

second group of chimpanzees was tested that had not been habituated to the mirror. These chimps behaved agonistically toward their reflection as the initial group had and did not display mark-directed behavior.

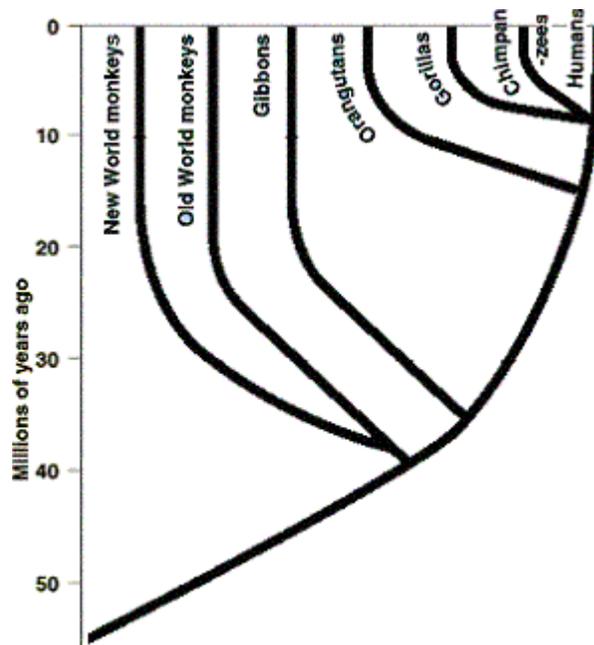
This set of experiments suggests that chimpanzees observe their reflection, become aware that it is a reflection of self, and thereafter use it to make self-oriented observations, whereas monkeys gain no such insight. Repeated studies of monkeys (New and Old World) and chimpanzees confirm this. One pair of monkeys mirror-habituated over a 17-year period failed to ever self-recognize in a mirror (Gallup 1977; 1994; Gallup, Wallnau, and Suarez 1980; Lethmate and Ducker 1973). Additionally, most other great apes, including orangutans and bonobos, display self-recognition using the mirror test (Gallup 1970; Lethmate and Ducker 1973; Miles 1994; Suarez and Gallup 1981; Walraven, van Elsacker, and Verheyen 1995; Westergaard and Hyatt 1994).

However, the data on gorillas is mostly negative (Ledbetter and Basen 1982; Shillito, Gallup, and Beck 1999; Suarez and Gallup 1981). Exceptions include Koko the captivity-raised lowland gorilla taught by developmental psychologist Penny Patterson to use American Sign Language as an infant and who reportedly understands as many as 2,000 spoken English words. Koko received a modified mirror test; she was swabbed with a 'sham' mark in four cases and a real mark in the fifth. She would touch the swabbed spot an average of 1-2 times in front of the mirror during each of the first four 10-minute sham cases but touched the mark 47 times when given the real mark. Other exceptions include Pogo and Bwana, zoo gorillas who were inadvertently marked with paint and reportedly used mirrors to observe and wipe the marks clean (Parker 1994).

Gorillas represent a problem phylogenetically. Whereas chimpanzees and

bonobos are more genetically related to humans through a common ancestor and a more recent divergence than are gorillas to humans or even gorillas to chimpanzees and bonobos, the line that became orangutans diverged before gorillas (Figure 9.1). This suggests a hominid ancestor of all great apes could recognize itself but that this ability has been lost or greatly reduced in gorillas (Gallup 1998). The exhibition of self-recognition (viz. SA) by only a few gorillas that have been exposed to uniquely enriched cognitive environments suggests that gorillas may have the capacity for SA but it is unrealized except under these extraordinary circumstances.

*Figure 9.1 Great ape phylogeny*



Evolutionary psychologist and anthropologist Daniel Povinelli (1995)

hypothesizes that in the natural developmental setting of the gorilla is less challenging than that experienced in evolutionary history by the other great apes. Therefore, gorilla SA has laid dormant and only manifests under extreme circumstances. To explain SA emergence in other great apes he suggests, in what is termed the ‘clambering hypothesis,’

that large tree-dwelling apes must continually consider whether a particular limb or vine will support their weight. Modern orangutans, for instance, appear much more deliberate in their movement, as opposed to smaller primates, which appear to heedlessly and automatically move rapidly from branch to branch. This, Povinelli (1995) suggests, may be the root of SA and explain why, since clambering is little used by gorillas, it lays dormant in their cognitive arsenal. Gallup takes a more parsimonious stance, pointing out that when the mirror test is rigorously implemented, gorillas simply do not pass. SA is cognitively expensive to maintain; if not useful, it would have been selected against.

The presence of self-recognition in non-human primates does not prove they are self-awareness, but it does strongly support the argument. Evidence of ToM provides additional support, as outlined in the following section.

### *1.2 TOM IN NON-HUMAN PRIMATES*

Though it is generally acknowledged that chimpanzees possess self-recognition, definitive evidence of ToM in non-human primates has been more difficult to establish. Recently, however, tests have been devised that demonstrate ToM in chimpanzees. Developmental and comparative psychologist Michael Tomasello (2003) noticed that chimpanzees in the lab produce visually-based signals toward humans only when the intended recipient is able to see the signals—in other words, not when the person's back is to the chimp—suggesting previous experiments testing ToM in chimpanzees were ill-designed to elicit the behavior. So tests were designed in which subordinate and dominant chimpanzees were competing for food. One allotment was placed so both could see it and another so only the subordinate could see it. Even when the subordinate was released to retrieve food before the dominant, it took advantage of the hidden food,

leaving the visible food to the dominant. Yet when there was no competition over food and only the subordinate was able to see it being placed, the subordinate showed no preference for location. A second test allowed one or both to view the hiding of food. When both were released, the subordinate avoided food the dominant had seen being hidden, even if it was now visible only to the subordinate. When the dominant was not allowed to watch the food being hidden, the subordinate showed no avoidance toward retrieving food in the open or hidden. A third test involved a human with food in his hands and in which he behaved as if he was either unwilling (e.g., using the food to taunt) or unable (e.g., food stuck in a tube) to give it to the chimps. The animals displayed more impatience by banging on the cage and leaving the area when the human was unwilling than when unable.

Admittedly, this evidence indicates a capacity for ToM that is a mere degree of what humans display. Human children can understand that different people can visually attend to different things when looking at the same area, that things appear different from different angles, that people can have intentions toward manipulating another person's psychological state, and that there can be prior intentions embedded in others' behavior. Chimpanzees are not capable of these advanced forms of ToM (Tomasello, Call, and Hare 2003). Yet beyond such direct evidence is the well-established data, at least among apes, of deception, which implies ToM. Baron-Cohen (1999) lists eight behaviors that are dependent on ToM, including intentional deception. Studies of social intelligence in apes suggest that the common ancestor of apes and humans already possessed SA and ToM to some degree. Yet apes do not display many of the other eight dependent behaviors, which include intentionally communicating with others, repairing failed communication

with others, teaching others, intentionally persuading others, building shared plans and goals, intentionally sharing a focus or topic of attention, and pretending (Baron-Cohen 1999). This suggests that intentional deception (and certainly to a modest degree, because deception can be extremely rudimentary or very elaborate) entails a primitive form of ToM.

Behavioral deficits in relations toward others and self-focused behavior among infant monkeys with neonatal damage to the amygdalohippocampal complex (Bachevalier 1996) further suggest that this model may be an elaboration in the Hominoidea line of ancestral circuitry. Given that autism in humans is not a unitary dysfunction of the frontal cortex but is multidimensional and may involve myriad systems, such as the temporal lobes and amygdalohippocampal complex, these monkey models indirectly support that this elaboration is, nonetheless, in the PFC. And it is precisely such elaboration, potentially of the monitoring system for motion of conspecifics (Frith and Frith 1999; 2001; Siegal and Varley 2002) or the mirror neuron system (Gallese and Goldman 1998; Umiltà, Kohler, Gallese, Fogassi, Fadiga, Keysers, and Rizzolatti 2001), that provides the behavioral flexibility that characterizes primates in general and the great apes specifically.

SA and ToM facilitate complex and subtle social navigation skills. An example of such behavioral flexibility is the difference between monkeys and some apes in the ability to extrapolate beyond the social intelligence shared by primates to ‘read’ non-social contextual information. Vervet monkeys are highly sensitive to social subtleties such as rank, kinship, and group membership and are capable of using alarm calls to identify specific predator hazards. Yet they are unable to abstract that obvious tracks of predators

represent the predators' nearby presence (or fail to react when confronted with experimentally faked tracks) and and run screaming when they stumble upon said predator (Cheney and Seyfarth 1985; 1992). Chimpanzees, on the other hand, regularly sniff at and examine nests and tracks of other chimpanzees when engaged in territorial raids of neighboring groups (Goodall 1986), suggesting a perception of the absent neighbors based on an abstract representation of them.

SA arguably entails great cost and is only evident if there is a sufficient advantage, which ToM seems to convey. The argument was made that because of the cost of SA, evidence for either SA or ToM presupposes the other. I argue that dissociation is the function of consciousness that mitigates the cost of SA in any species that possesses it and that the elaboration of dissociation will correspond with the sophistication of SA and ToM. This is important when considering why glossolalia may have been chosen as the preeminent sign of acceptance of Jesus among Apostolics—and dissociation the central feature of so many other religio-cultural complexes—and why dissociation may be tied to the success of Pentecostalism.

## *2. DISSOCIATING SELF-AWARENESS AND THEORY OF MIND*

Questions remain as to why only humans among self-aware species possess higher consciousness and why this consciousness has so many limitations. Why do some people seek to enhance their consciousness while others say that ignorance is bliss? In evolutionary terms, what is the usefulness of enhanced consciousness in terms of reproductive success?

There are two straight-forward explanations for limited consciousness. The first could simply be a function of experience. The extent to which an experience is novel

should be inversely correlated to the awareness an individual has of factors relating to that experience. The second explanation may be adaptive. It appears that certain awareness can be potentially harmful and is purposively avoided or dissociated by the brain. There are certain realms of experience of which consciousness provides little awareness, such as the workings of one's own body and consciousness itself. There is also little individual awareness of much that is directly apprehensible to the five senses and available in memory (Damasio 1999). A person can become unaware of aspects of his or her own experiences, as well as of elements of dynamic relationships with others, though the information for awareness may be present. There appears to have been selection against being completely aware of oneself and all the workings of one's mind and body, as well as against always attributing likely mental states to others when such awareness could be problematical. This, at least, is one argument for an evolutionary selection for religion and universal sub-domains of religious behavior, like dissociation.

The function of dissociation in delimiting consciousness is a check on potential maladaptive ramifications of SA. This proposition is consistent with the hypothesis that self-deception, a form of dissociation, protects humans from mental illness (Lane, Merikangas, Schwartz, Huang, and Prusoff 1990; Sackeim and Gur 1979; Sackeim and Wegner 1986). Dissociation might be thought of as gradations of non-consciousness. This is most purely observed in sleep, wherein scenarios play out (dreams) that often don't make sense to the conscious mind if they are even remembered, suggesting that they are an aspect of homeostatic function that is not directly related to consciousness. This is consistent with the data from this study (Table 9.2), which showed that 29% of participants are aware of their thoughts (29%), during glossolalia, 24% are only

sometimes aware, while only 9% reported not being aware at all during glossolalia. This is different from memory of the experiences (Table 9.3), in which 56% report remembering the experience, 9% report only sometimes remembering, and only one participant reported not remembering at all.

*Table 9.2 Awareness of thoughts during glossolalia*

	Frequency	%
yes	16	29.09
no	5	9.09
sometimes	13	23.64
N/A	10	18.18
Sub-total	44	80.00
Missing	11	20.00
Total	55	100

*Table 9.3 Remember the experience of glossolalia*

	Frequency	%
yes	31	56.36
no	1	1.82
sometimes	5	9.09
N/A	10	18.18
Sub-total	47	85.45
Missing	8	14.55
Total	55	100

Dissociation as an active brain function has either been selected for to mitigate consciousness or that a merely limited SA and ToM have been selected for, to bring humanity only somewhat out of the darkness of non-consciousness. Given the myriad forms of deafferentation lumped as dissociation, the latter is the more likely. Either way, there are three candidate evolutionary scenarios for this process, which are not mutually exclusive. Two have been proposed for self-deception and the other for hypnotizability, but can be generalized for the dissociation concept as a whole. Trivers (2000) posits that (1) self-deception could minimize awareness of personal deficits and enable an organism to project maximum confidence to potential mates and to be assertive. By the same

token, (2) self-deceit in an agonistic encounter would enable a smaller or weaker organism to convincingly act as if it were not smaller or weaker. As convincing threats often serve to deter aggression, this would both preserve the organism's potential reproductive life and could promote its position in hierarchical organizations, making the organism more attractive to mates by signaling its genetic quality. McClenon (1997; 2002) indicates that (3) hypnotizability has been selected for because it improves health and increases survivorship by reducing stress. This can be expanded upon by asserting that the ramifications of SA and ToM are inherently stressful, that the curse embodied through consciousness is exponentially increased psychosocial stress and the concomitant physiological impact on the mechanisms of the biological stress system. Therefore, any inherent resistance to the deleterious immunological affects of stress will enhance survivorship. As with aggression, this naturally increases the chances of leaving more offspring but more directly signifies to the opposite sex that this ability to maintain health in spite of stress is a sign of quality genes and a good mate choice, facilitating greater reproductive success.

This latter hypothesis has particular relevance to the current study. Marriage within the Apostolic church follows implicit rules and patterns of behavior. Premarital sex is verboten, though certainly backsliding of this type probably occurs. Members confer with elders and seek guidance and approval before entering into marriage. Those who have not validated their relationship with God by speaking in tongues may not be considered ready for marriage. Once engaged, marriage must take place within a few months, and pregnancy generally follows soon after. While marriage and reproduction patterns were not specifically investigated in this research, Richie and Amanda's primary

sources of conflict with the church was that they rushed into marriage without guidance by elders and then divorced, and neither had received validation by the congregation for their current lifestyle as suggested by acceptance of their HGG. Other courtships have been observed that implicitly follow the opposite course. Several young people during the course of this research received the Holy Ghost for the first time, then became engaged, married, and the female became pregnant in quick succession (though I can also think of at least one marriage that involved a core member who has yet to receive the Holy Ghost). Future research should seek quantitative data to support this interpretation. And Apostolic families tend to consist of numerous children, with churches based around elite and core families. TAC is based around one family of four brothers, their wives, children, and mother and numerous cousins and in-laws. ALT is based around three families, one of which is two parents with five children; another is two parents, eight children, and a nephew; and the third is two brothers and their wives and children.

This speculation requires testing, but it is still unclear how dissociation could become a feature of Pentecostalism or any other religion to affect selection. If religion is an evolutionary mode of dissociation, why don't other self-aware primates display religious behaviors?

### *2.1 SELECTION FOR DISSOCIATION*

It would be inaccurate to portray selection for limited consciousness as anything less than polygenic or that selection occurred specifically to facilitate any culturally-relative behaviors. Winkelman's "Shamanism and Cognitive Evolution" (2002) exemplifies the confusion and controversy that surround selection for dissociation, especially as pertains to culturally-relative and drug-induced forms. Winkelman contends that ASC served to

integrate the neural systems or modules to constitute consciousness in evolutionary history. Confusion reigns because what Winkelman (2000; 2002) and, following his argument, McClenon (1997; 2002) argue is that behaviors which would become characteristic of shamanic cultures were selected for as advantageous because of this integrative function. This argument takes a group selectionist position but one that may be tenable by holding that groups of genetically related people who exhibited shamanistic behavior would have accrued enhanced survivorship on the individual level and reproductive success relative to other groups not engaged in these behaviors. This is not to say that a particular type of religion was selected for but that behaviors which have historically lent themselves to religious behavior were.

Newberg (2006) makes a similar argument in his studies of transcendent experiences. He has performed brain scans on both religion practitioners and atheistic meditators and found consistency in the way spiritual and secular meditation and prayer influence brain neuro-chemistry. Religious experiences are merely a subset of transcendent experiences, which are a subset of dissociation. Renewed biomedical studies of psilocybin (Griffiths, Richards, McCann, and Jesse 2006) support this. Sixty-seven percent of hallucinogen-naïve participants of normally-distributed religiosity (intermittent to daily religious observance) in a double-blind study rated the psilocybin experience as their most or among their top five most meaningful lifetime experiences. And evolutionary anthropologist David Wilson and his student Ingrid Storm (2009) have argued that group selection can explain why religion persists across cultures but varies greatly. He has found that religious liberalism and conservatism correlate with SES and social stability. From an evolutionary perspective, they argue, different degrees of

religious liberalism/conservatism have been selected for by different environment.

Testimonials and interview data are consistent with this. Though significant differences were found between high and low LGE groups, I suspect that the transcendent experience of glossolalia may effect similar change. Yet, in attempting to assess the power of transcendence through creation of the GEI, which also accounted for frequency and duration of experiences, significance disappeared. It is possible that, because glossolalia can frequently be extremely short (ten seconds or less) and infrequent (once or twice ever) in some people, it does not have the same transcendent impact as the hours-long duration of psychotropic hallucinogens. But for those reporting long and intense experiences, the significance of the impact cannot seemingly be estimated by current quantitative means.

Transformation is part of its social construction, so the habitus of Apostolic behavior comprises the observed and fabled historical antecedent of reported and observed transformation in family and friends. Thus, participants expect and report it. The fact that the GEI was not a significant predictor is very interesting because it suggests that the nuances of body hexis it is intended to detect are not uniformly transferred to the habitus of each agent of Apostolic behavior. There is a gloss of ‘transformation’ that is expected, but the micro-experiences may be less consistently reported from individual to individual. These individual agents experiencing glossolalia may not have a fully constructed historical context of the dimensions of glossolalia upon which to draw, only that they need to experience it and experience it repeatedly. Indeed, I never heard any sermon or testimonial suggest that to be valid glossolalia should be of any specific duration or intensity or how it should leave the individual feeling. Rather,

descriptions are qualitative. As previously reported, one woman reported that it overwhelmed her with feelings of love and wonder surpassing that which she felt for her children. Another said that it totally reversed her entire outlook, wiping away the cynicism that previously marked her disposition. Yet another informant reported accompanying hallucinations of Jesus and Moses. But for others it was merely an event to be remembered, the details of which were seemingly irrelevant to anyone but me.

### *2.1.1 Dissociation as an implicit mating strategy.*

The explanation lacking in this scenario is how dissociative capacities achieved the sophistication of shamanistic behaviors to be selected for. It seems likely that they were chosen for first and foremost within mating strategies and agonistic encounters, and then could be selected in relation to health-accruing benefits. There is substantial evidence that, in human sexual relations, males are, statistically speaking, opportunistic maters that compete to inseminate as many females as possible; whereas females are discriminate maters and must be selective in choosing mates (Gangestad and Simpson 2000). As they have a limited number of reproductive opportunities because of their limited number of eggs, reproductive lifespan, and greater offspring investment, females optimize their reproductive fitness by choosing an optimal male that is both genetically fit and will invest in her and their future offspring together. Given that these choosy females produce the next generation of males and that male sexual behavior is genetically-based, male sexual behavior is driven by female mate choice (Buss and Schmitt 1993; Trivers 1972).

Based on this model, it is in the male's best interest to secure sexual relations through whatever means will enhance his sexual conquests. This means it is in his best interests to engage in sexual relationships in such a way that damage to his reputation

does not prevent him from further sexual relationships. It follows that males should be selectively skilled in deception in this arena. In accordance with what evolutionary psychologist David Buss (1989) terms “strategic interference theory,” this compromises female long-term reproductive interests. As a consequence, women appear to have been selected for the counter-strategy of deception-detection (Johnson, Barnacz, Constantino, Triano, Shackelford, and Keenan 2004). Their directional influence on male sexual behavior would favor males with honest mating strategies. Indeed, a recent study of mate selection criteria found that while both sexes value sincerity higher than any other trait in a potential mate, females prefer it significantly more than males (Haselton, Buss, Oubaid, and Angleitner 2005).

Extending this line of reasoning with regard to possible historical evolutionary process, an unconscious (i.e., outside of awareness, not ‘out cold’) male counter-strategy might be an honest mating strategy of commitment, followed by a post-reproductive change of heart. By consistently expressing sincere emotions signaling commitment and, most importantly, experiencing the concomitant feelings of those emotions, males not trying to conceal a proximate goal of mere sexual conquest would not be detected as liars, though their feelings change soon after. This could be less damaging to a male’s reputation than dishonest mating strategies. Males may have been selected to believe that they are in love with a female so as to be convincing—deceiving female deception-detection capabilities by deceiving themselves. After sexual access has been granted and male feelings of love diminish, they break off relationships. Because such males tend to fall in love serially and fail to maintain committed relationships, females may accuse them of shallowness or lacking personal insight but ultimately consider them naïve,

which may be less costly than being marked a womanizer (i.e., males that are higher in attractiveness may be more successful womanizers and less affected by this cost).

From an evolutionary perspective females are concerned with genetic fitness and resource allocation in male mates (Buss 2003), two important indicators of which are low fluctuating asymmetry (FA)—i.e., bilateral symmetry, which is evidence of genetic quality through the manifestation of developmental stability (Moller and Swaddle 1998)—and sincerity of commitment or romantic love (Buss 2003). Under such hypothetical circumstances, four types of males can be proposed, though in reality a gradient exists among them: those who display (1) low FA and high sincerity, (2) low FA and low sincerity, (3) high FA and high sincerity, and (4) high FA and low sincerity. This model predicts that (A) women should prefer the high FA and high sincerity male, but it is predicted that this male would be rare because the benefit of high over low sincerity in a high FA male is negligible. (B) The second and third choice mirror the dad/cad scenario demonstrated in hypothetical scenarios (Kruger, Fisher, and Jobling 2003; Simpson and Gangestad 1992), in which females prefer highly attractive but untrustworthy males (cad) for short term affairs and less attractive but more trustworthy males (dad) for long term mates. The benefits of a genetically fit mate would be outweighed by the cost of lacking resources for her offspring and self, as well as the reduced probability of future pair-bonded reproductive opportunities (Buss 2003; Trivers 1972). In actual practice (C), I posit that most females probably opt toward a balance and genetic quality and honesty. (D) The low FA and insincere male should have the fewest reproductive and long-term mating opportunities.

Thus, sincerity is valued, but selection probably does not favor it over all other

trades. However, because of its importance in many domains, as outlined in previous sections and suggested by the data in this study, sincerity or honesty is valued. There are cultural rules and other influences that motivate individuals to be honest. One such motivator is the rewards to health that honesty facilitates through being accepted by a community like Apostolics. This is in addition to the absolution religion provides from some types of stress, such as those involving lack of control. By “letting go and letting God,” individuals free themselves from worrying whether things will work out for the best and put their trust in God. This trust is another dimension of sincerity that is inculcated in such groups through a theoretical dual embodiment involving selection at a species level and cultural factors that account for the stressors of consciousness that selection processes have not suppressed.

It must be acknowledged that this model is potentially biased toward Euro-American models of mating behavior, particularly as derived from psychological studies among American college students, and requires cross-cultural validation. Nevertheless, relative to dissociation phenomenology, it suggests that sincerity in non-committal males may in some cases be a form of self-deceit that disguises personal deficiencies from oneself to maximize reproductive fitness (Trivers 2000). As previously mentioned, evidence suggests that such dissociation of SA has health benefits (Taylor and Brown 1994) and may also enhance reproductive success. From an evolutionary perspective, it may be in male best interests to lack insight into their own emotional and sexual motivations. This might explain the stereotypical male inability to express their feelings. A negative correlation was found in a study comparing the extent to which one talks to oneself about oneself, based on the mediating role inner speech plays in SA (Morin

1995), and self-deception (Siegrist 1995). A testable prediction would be that introspective males and those with greater education regarding such psychological and biological processes have more self-insight, less self-deception, and consequentially lower reproductive success. This scenario is further complicated by evidence suggesting a female predilection for intelligence over wealth in males (Haselton and Miller 2006), which may be a female counter-strategy that serves to enhance male SA and ToM. A consequence of such enhanced male awareness may be an increased ability to recognize one's true proximate motivations or an increased sense of responsibility resulting in higher reliability/loyalty toward mate and offspring.

This evolutionary arms race does not stop there, as females may have become familiar with the 'good intentions' ploy of males and become suspicious of sincerity. Males may have been forced to produce proof of sincerity and collateral against their defaulting on the commitment. Support for this may be the display of costly honest signaling in humans. Biocultural anthropologist Lee Cronk and his student Bria Dunham (2007) found in a study among American couples in Ohio that the engagement ring presented by the male to the female is proportionate to the resources that will be available to the couple when institutionally pair-bonded (married).

### *2.1.2 The sexiness of health through dissociation.*

Established capacity for dissociation could then have enabled further selection for health-related variations, which could be moderated by emerging cultural patterns. McClenon (1997) proposes that (1) analgesic attributes of hypnosis may have enhanced survival among *Homo erectus/ergaster* and imputed calmness that may have been sexually selected, thus conferring reproductive advantage; (2) the efficacy of ritual ASC use is

positively correlated with individual hypnotizability; (3) hypnotizability has a genetic component; (4) ritual ASC was practiced over a long enough period of time for hypnotizability genotypes to be selected for; and (5) that the capacity for hypnotizability has influenced the occurrence and development of cultural behaviors associated with shamanism, transpersonal and paranormal experiences, and religious spirituality.

A candidate gene has come to light for hypnosis, supporting McClenon's model. Lichtenberg and his colleagues have found a significant difference in the hypnotizability of genotypes for the catechol-O-methioninehyltransferase (COMT) polymorphism (Lichtenberg, Bachner-Melman, Gritsenko, and Ebstein 2000; Lichtenberg, Bachner-Melman, Ebstein, and Crawford 2004). COMT is also implicated in pain regulation through its dopaminergic regulation. Furthermore, it is a strong candidate gene for influencing susceptibility to schizophrenia, particularly in cases of COMT gene deletion (Williams, Owen, and O'Donovan 2007). It is conceivable that the valine-to-methionine (Val/Met) polymorphism that regulates the high and low forms of the COMT enzyme could be related to degrees of schizotypal traits and dissociation.

McClenon (1997) suggests that selection for such genotypes could have occurred in *Homo erectus/ergaster*, as they are the earliest hominins associated with manipulation of fire. He proposes that fire is a hypnotic inductor and that sitting around staring into fires would have had a hypnotic, stress-reducing analgesic affect for those susceptible. Though there is no evidence for fire as a hypnotic inductor, this model seems intuitively plausible. It would be relatively easy to test the hypnotic inductance of fire in humans and non-human primates, and evidence is accumulating regarding the controlled use of fire by hominin ancestors (cf. Goren-Inbar, Alpers, Kislev, Simchoni, Melamed, Ben

Nun, and Werker 2004).

Additionally, given the results of the current study, it would be instructive to utilize measures of hypnotizability in future research. If high and low LGE groups differ in hypnotizability, it would have significant implications. For instance, high and low LGE groups appear to invest differentially in the lifestyle modifications required of devotion to God. However, it is possible that individuals who make such changes but are less hypnotizable may be discouraged by the lack of validation and return to previous patterns of behavior. Those who are more hypnotizable may be more easily validated by achieving glossolalia, thus receive reinforcement to continue their changed behavior. Thus, a fundamental predisposition to dissociate may underlie the local biological difference between the two groups, as suggested by one hypothesis of the diathesis-stress model of dissociation, though substantiating this distinction empirically through standard hypnotizability tests is impeded by the problem of developmental indeterminacy. However, if the COMT gene is substantiated in its hypothetical association with hypnotizability, it would provide an additional route for testing this role of local biology.

## *2.2 NON-HUMAN EVIDENCE FOR DISSOCIATION*

Several lines of evidence indicate that non-humans also make use of dissociation in roughly similar ways as humans. Like humans, animals purposely ingest psychoactive and intoxicating plants, which are common inducers of ASC-dissociative experiences across human cultures. Drug-seeking behavior in animals is not surprising and follows similar patterns as in humans, as anyone who has introduced a cat to catnip can attest (Siegel 1989). Exogenous drugs that act as receptor agonists do so by activating the receptors of endogenous neurotransmitters (as opposed to antagonists, which block

receptor activity), triggering innate reward drives for biologically imperative behavior. It is not surprising, therefore, that such animals and plants may have co-evolved to accommodate each other.

The seeds were sown throughout history, in the stomachs of poisoned animals—perhaps dinosaurs—by birds and beasts who carried the seeds across the planet, and in the rain forests and jungles that nurtured them. From accident to addiction; from goats foraging on coffee beans to humans drinking their daily stimulants; from bees revisiting opium and...elephants who seek out fermented fruit to alleviate stress... (Siegel 1989)[Siegel 1989:15-16]

According to South African naturalist Eugene Marais, who lived among a troop of 300 wild Chacma baboons for three years, alcohol seems the universal intoxicant of choice for primates to dissociate. The baboons passed through tobacco field regularly and scarcely took notice but went out of their way to eat the rare, malodorous fruit of a tree in the Cycadaceae family even in times of abounding tastier food. Baboons feast on the fruit, which is poisonous to humans, and then manifest a staggering gait and inability to move quickly, as if intoxicated. They seem heedless of danger under such circumstances, such that they become more susceptible than usual to hunters' dogs and rifles (Marais 1940; 1969).

McClenon (2002) believes there is an appreciable distribution of hypnotizability among non-human primates. Many display repetitive, ritual-like behaviors, which, consistent with Wier's (1996) trance model ("1.3.1 Primary- and secondary-order trance generating *loops*."), may be sufficient to induce dissociative trance. Chimpanzees have proven especially susceptible to hypnosis and ostensibly engage in repetitive behavior to reduce stress (McClenon 2002). Dancing and rhythmic stimulation, another common inducer of ASC-dissociation in humans, has been observed in chimpanzees. Winkelman (2002) considers their reported pant-hooting displays in response to heavy rain and

thunder (Goodall 1986) and the ‘primitive dancing’ observed by German psychology Wolfgang Köhler (1925:314-315) as homologous to human dissociation rituals.

### 2.3 ARCHAEOLOGICAL EVIDENCE FOR DISSOCIATION

There is currently no direct fossil evidence for dissociation. One concept of dissociation<sup>11</sup> is as the non-dominant neural pathways—essentially ‘non-consciousness.’ According to neuroscientist Christof Koch and the late geneticist Francis Crick, consciousness appears not to be a hierarchical system of elaboration as phylogeny might lead one to believe but a capacity emerging out of increasingly complex yet ancient neurology. To simplify the quest for differences from mammals sharing basic human neurology but lacking consciousness, Crick and Koch, (Crick and Koch 2003; Koch 2003) have focused on awareness of visual stimuli. Their evidence suggests that neural coalitions compete for functional connectivity. Those coalitions in control are the ones that have amassed the most affiliated neurons, and this critical mass of neural activity is what brings awareness. Thus, the coalitions that are successful determine what a being is conscious of. A change in consciousness must take place when a conflicting coalition accrues enough neural support to overwhelm, change, or divert the signal from the pathways of the previous coalition (Crick and Koch 2003).

Dissociation, in this model, is those active neural pathways that are not part of the coalition and, thus, are not part of awareness. The general prediction for the fossil record would therefore be that lack of evidence for consciousness is evidence for dissociation, that dissociation is the status quo of non-conscious species. While this may be true, it is unsatisfying. A finer-grained perspective, for instance, would predict that, if fire produced a hypnotic effect in *Homo erectus/ergaster*, shamanistic behavior soon

followed, leaving material remains. The most compelling argument for archaeological evidence of dissociation is, in fact, in the context of ASC. Winkelman (2002) cites rare anthrozoomorphic cave art as suggestive of prehistoric, integrative shamanistic trance states. Because these depictions appear deep in hard to reach caves with other suggestive imagery, they are interpreted by many to be remains of prehistoric shamanistic ritual sites (Clottes and Lewis-Williams 1998). The depictions are of anthropoid bodies juxtaposed with animalistic heads and features, which is conceivable in the abstract—i.e., a scenario we can imagine or build but which we likely have not observed in the absence of manipulative creativity—but not observable in nature (Clottes and Lewis-Williams 1998; Lewis-Williams 2002). It is certainly possible, and, indeed, likely, that shamanism was not the only context in which humans conceived of themselves as sporting an animal head. Animals skins with heads are a common hunting camouflage, which would nonetheless require the ability to take the perspective of oneself in another's or an animal's eyes. Such tactics are even observed among insects; for instance there is an African bug that disguises itself with the bodies of dead ants to sneak into ant colonies and feast on its inhabitants (Rue 1994:82). And the idea of these depictions as “art-for-the-sake-of-art” has been rejected repeatedly for over a hundred years, despite being reiterated periodically (see Lewis-Williams 2002:42-44 for review ). Creative expression is essentially social, and in fact the more appropriate anthropological term expresses this—‘expressive culture.’<sup>12</sup>

Lewis-Williams employs a structuralist paradigm to interpret this cave art. Because parts of images are recurrent across numerous panels, it is inferred that they are symbolic or compositional devices (for instance, animals—smaller herbivores, large

herbivores, peripheral species, and dangerous animals—and signs). These recurrent natural and symbolic expressions have been interpreted as expressions of the natural and supernatural organization of the world (Lewis-Williams 2002:61-63). Additionally, as mentioned in chapter 2, there is a strong association between phosphenes (patterns perceived by the brain in the absence of visual stimuli, generally caused by pressure to the eye, head trauma, migraine headaches, physical and mental deprivation, fasting, endurance tests, meditation, and psychotropic substances) and both contemporary and prehistoric rock art cross-culturally (Hedges 1981). Goodman’s replication of postures depicted in rock art, paintings, and statuary ranging from the Old Stone Age to contemporary shamanic cultures supports this. Contemporary shamans utilize specific positions to achieve these trance states, thus there is a direct link between ethnographic data and modern images of trance postures. Furthermore, in interpreting prehistoric depictions as such and attempting to emulate them, participants in Goodman’s study and Cuyamungue Institute achieve trance state she has interpreted as being the basis of primeval human religious practices (1990).

#### *2.4 GLOSSOLALIA AND CONSCIOUSNESS*

While this study did not test a relationship between glossolalia and consciousness or awareness, it does lend support to the proposition that dissociation delimits awareness (SA and, thereby, awareness of the perspectives of others) to reduce or filter the inherent stress of consciousness. The reduction in cortisol levels in the high LGE group on Monday (non-service day), when controlling for perceived stress, suggests that glossolalia, along with physical exercise, influences a reduction in the reactivity of biological stress response. This may be a function of the filtering effect of dissociation or

the downtuning of stress reactivity through “practice” or “exercise” of the body’s stress response via culturally mediated trance behavior. Though the association between glossolalia and cortisol is not strong, this proposition is given support by the strong association of glossolalia and  $\alpha$ -Amylase. The relatively high levels among the high LGE group on Monday suggest a more positive mood prevails among glossolalists. Apostolics emphasize the value of putting one’s troubles in God’s hands and to not focus on self. Indeed, this is the emphasis of many religious traditions, which, I would argue, supports an adaptationist perspective with regard to such long-established religious systems in an evolutionary context.

Yet, Pentecostalism is an experientially embodied religion, though certainly not the only one, as its practice is both physical and emotional in breaking the repetitive cognitive loops of narcissistic self-concern and SA. This active production of trance behavior, of a cognitive loop separate from the one focused on self, is a strong force in the lives of the brethren. By breaking the loop of self, they also break the loop of perspective taking (ToM), and thus are not only less preoccupied with themselves but also less concerned with the worries of others. This may seem counterintuitive, given the Christian emphasis on charity and community, but what I am suggesting is that this breaking of perspective taking and ToM prevents individuals from taking on the worries and subjectivity of others—to, in other words, mind their own business and to not worry about what others think of them—while still being charitable and conscientious citizens.

For example, I had a conversation with one of the brethren about the death of a child of one of his relatives for which he was imminently leaving the country to go to the funeral. Paraphrasing, I said that before I had children, I would console others in this

situation but any personal emotional impact would otherwise roll off me. ‘Now,’ I said, ‘I think about my own children and what that must feel like, and it devastates me. That must be so hard to go through.’

He said, ‘Well, for them, yes.’

I said, ‘Well, for you too, because you have children that age as well.’

He said, ‘You just don’t think about it. God has a purpose for everything, and everyone must endure something. There’s no need to endure someone else’s suffering.’

I said, ‘Intellectually, I understand what you’re saying, but it’s still emotionally overwhelming to consider losing my child at such a young age.’

He said, ‘Well, it’s not your child, so just don’t think about it that way. You focus on God, and understand that He has a purpose for everything, and do the things you need to do in your own life. That is someone else’s life, and they have to go through that.’

He spoke of this almost as though it were my relative that had experienced the loss and with which I was trying to cope, not his own. His repeated proclamations to ‘just not think about it’ seem naïve, save for the powerful psychobiological force of ecstatic prayer and trance, which involve the entire physicality of an individual and seem to have the power to literally break unproductive bioloops. It is not simply a matter of willpower, but an intellectual, emotional, physical, and social effort, which, as Martin puts it, “truly animates the whole biological ‘machine’” (Martin 1990) and, as Worthman (1999:63-64) says, truly a historical representation of person-environment interactions through anatomy, body hexis, emotions, and habitus—i.e., “deep socialization.”

This data supports that those deeply socialized in Apostolic behaviors may indeed be better able to filter stressful psychological information, evaluate it as less stressful, or

recover from it faster, and, consequently, have a more positive outlook than those less deeply socialized. As indicated, this study did not directly test aspects of consciousness, so these conclusions must be considered tentative, but they are consistent with an accumulating literature on the psychoneuroimmunological value of religious practices (Koenig and Cohen 2002).

### 3. *SUMMARY*

Human consciousness is a social function, dependent on the ability to plan and strategize in a social context replete with manipulation and deception. The dynamic nature of human sociality requires that humans be able to adapt to changing variables of social contexts and so be able to conceive of the beliefs of others—i.e., to mindread. This ability requires that humans have an awareness of self—in other words, to mentally propose, “What would I do were I in that situation?” It is also generally agreed that these abilities, albeit in rudimentary form, are shared by and large with the great apes.

Although the evidence of ToM in the great apes is not well substantiated, there is reason to believe that any creature possessing fully elaborated SA sufficient to pass the mirror test will also possess at least rudimentary ToM, as SA is a socially relative ability that is seemingly irrelevant without the concomitant ability to imagine the thoughts of others and what others might be thinking about oneself. It is well-established that big brains are expensive and the costs must be minimized to justify their benefits. Less established is the extent of those costs.

The discussion in this chapter has proposed that both a SA/ToM module and dissociation confer benefits, which are in seeming conflict. SA/ToM confer benefits, but to a limited degree. Beyond that, they may be more costly than their worth. Dissociation

is a functional process that limits consciousness through the physiological process of deafferentation. Culture is a dynamic demonstration that consciousness is a very creative and constructive adaptation. By the same token, culture, beyond the limits of purposive consciousness, is also equally dynamic through interaction with human non-consciousness. Data from several disciplines, including the current study, was integrated in support of this position. Much more research needs to be undertaken to substantiate it, including a clearly articulated and operationalizable conception of dissociation as a function of human consciousness, rather than a mere default state of non-consciousness.

## 10. CONCLUSIONS AND FUTURE RESEARCH

### *1. SUMMARY OF CURRENT STUDY*

This dissertation views dissociation, a partitioning of conscious awareness, from the perspective of the anthropological-discursive paradigm (Seligman and Kirmayer 2008). As such, it is viewed from emic and etic perspectives and as a cross-cultural, dually embodied phenomenon that varies in form, degree, and interpretation as normative and pathological. As outlined in chapters 2, 3, and 7, dissociative states and religious behavioral directives limit awareness, which limits stress. A significant evolutionary cost to conscious awareness may be the stress of knowing too much. People have conflicting needs, desires, and demands even within the church, and the more people are aware of those conflicts, the more potential stress they may experience in trying to resolve them. By the same token, knowledge of the world and its many conflicts and temptations may also increase such stress. Informants in the current study say worldliness and people-pleasing are lures of the devil, which is why they cause so much anguish for people. By focusing attention on God, on practicing the habitus perceived to bring one closer to God, and on specific activities designed to invoke God, Apostolic practices (and many other religious practices, such as monastic asceticism) seem to reduce conscious awareness of alternatives and the burden of choosing. This supports a theory that dissociation in various forms has been evolutionarily selected for to limit the deleterious affects of too much consciousness.

This model of human consciousness is lent further support by the quantitative data collected in this study. Biochemical analyses of the proxies of stress response, cortisol and  $\alpha$ -Amylase, reveal that individuals who have engaged in glossolalia to a greater

degree, 21 or more times in their lifetime (or, for most individuals in this group, more than they could possibly count), have a lower cortisol profile on Mondays compared to Sunday. On Sunday, according to the hypothesis, they were expected to display high levels of stress hormone, given the non-specific nature of biological stress response and the highly active worship in which Apostolics engage on Sundays. The findings support this expectation and show that on Mondays they have a lower profile than on Sunday. In contrast, it was expected that those more experienced in glossolalia would have lower profiles on Monday than those who are less experienced. While the findings support this aspect of the hypothesis, the differences were not significant. It was also expected that those less experienced in glossolalia would display high Sunday profiles because they also participate in Sunday service. Many in this group only attend church on Sunday, so it was proposed that the habit of highly experienced glossolalists to attend multiple services a week and speak in tongues more frequently would result in the difference on Monday. However, not only was the frequency of attendance (a component of the Faith Maturity Scale) not significant in any of the models, less experienced glossolalists displayed an overall lower Sunday profile (though, again, not statistically different).

In addition to this tentative support lent by cortisol outcomes,  $\alpha$ -Amylase analysis produced significant results, the implications of which will take some time to fully understand. Alpha-Amylase is a biochemical that is only beginning to be used in stress research and heretofore unused in a published anthropological study of population stress. The relationship of glossolalia to the difference in levels between Sunday and Monday between the two groups was significant in several dimensions. Additionally, the highly experienced glossolalists displayed a statistically significant increase in levels on Monday

relative to Sunday. This seems counterintuitive, given the interpretations of cortisol relative to stress. However, in other studies  $\alpha$ -Amylase is not correlated with cortisol or momentary stressors but with mood and chronic stress and mediated by smoking and physical activity. Given the significant difference between Sunday and Monday and information collected from qualitative investigation, it is inferred that chronic stress is less effective in the observed Monday profile among highly experienced glossolalists than the positive mood generally exhibited by devoted Apostolics as expressed in countless conversations and testimonials and numerous ethnographic interviews.

These findings are exciting, because no biocultural investigation of fundamentalist Christianity had to my knowledge been undertaken before this study. Since Goodman and Samarin's cross-cultural sociolinguistic analyses of glossolalia nearly 40 years ago, which both included reviews of biological bases of glossolalia but no direct investigation per se, there have been very few efforts to investigate the biological mechanisms of health in *in situ* religious contexts, though there is now considerable evidence of the efficacy of religious practice with regard to health and well-being. Dissociation, and particularly trance states, have long been of interest to anthropologists, and there is a psychological society and journal devoted specifically to the study of traumatic dissociation; but no biocultural investigation had been completed with regard to non-pathological, culturally relative dissociation, though some preliminary efforts certainly deserve acknowledgement (cf. Dorahy and Lewis 2001; Dorahy, Schumaker, Krishnamurthy, and Kumar 1997). This data is welcome evidence for scientists seeking to understand the human condition and for theologians interested in God's work. It is to the credit of Apostolics that, despite some persistent suspicion of scientific study of

religion, they opened their minds to participation in this research. One middle-aged participant noted that Apostolics would never have done so when he was a kid but that times change and has been excited to learn the results. Indeed, a recent meeting of the Society for Pentecostal Studies featured a keynote address by physician Harold Koenig, the primary proponent of psychoneuroimmunological studies of faith and author of *The Link Between Religion and Health: Psychoneuroimmunology and the Faith Factor* (2002) and the *Handbook of Religion and Health* (2001). The current study validates the need for continued research and the application of a similar model to other dimensions of religiosity, spirituality, and human dually embodied experience.

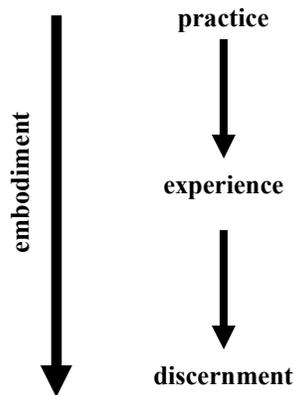
#### *1.1 REFLECTIONS ON EXPERIENTIAL RELIGION AND PHENOMENOLOGY*

Utilizing the phenomenology paradigm to approach Apostolic dissociation was is a natural fit. Philosopher Edmund Husserl, who is credited with developing phenomenology in reaction to the deficiencies he saw in the ‘natural sciences’ approach to psychology, felt that knowledge is obtained from experience more than from empirical research. This is also the express perspective of Pentecostals. More knowledge is acquired of God through experience than through listening to sermons or reading theologians or the bible or from objective fact-collecting. This is why Pentecostalism is referred to as an ‘experiential religion.’ The pathway to dual embodiment, as has been theoretically proposed in this dissertation, is the pathway to discernment, as has been explained to me by the brethren. Begin with whatever predisposition (genetic, habitus), then, through practice, accrue experience, and develop discernment, as I illustrate through one final diagram, Figure 10.1. Thus, from a cultural neurophenomenological perspective, the best way to fully understand the questionnaire and biochemical data I

have collected would have been through Apostolic practice, experiencing the Holy Ghost, and discerning the distinctions myself, through my own embodied insight, as to what constitutes HGG, backslider, iatrogenic, and factitious glossolalia. This, at any rate, was the continual suggestion of the brethren.

So, for a true phenomenological exegesis, I need to go through it and come out the other side. Does this dissertation, then, truly convey the embodiment of glossolalia? Perhaps, perhaps

*Figure 10.1 The cultural neurophenomenological pathway of discernment*



not. From this cul-de-sac I am writing myself into, I can simply say that only those who have experienced the Holy Ghost can make that assessment. As I stated in the beginning of this dissertation, it is not that I did not want to experience tarrying at the altar in supplication, but I did not want to be false as I was working to develop an honest relationship. I often consider going to a charismatic church where they don't know me and I am not conducting research to have this experience, and perhaps, now that I have got this much done, I will. But there are two sides to that as well: practice insinuates acceptance of the moral code, so, if I have not accepted but merely want to embody the practice, will the phenomenon I apprehend be the same phenomenon the brethren do?

Hmm. On the other hand, I daresay the brethren would tell me to give Jesus a chance, to supplicate myself at the altar and let Him surprise me. In other words, practice or action is transformative. There is no way to know if all the brethren experience the same phenomenon and, indeed, how many of them tarry at the altar out of deference to a friend or family member who drags them forward and finds they are in some way affected. The brethren have said to me, 'you will not know if you do not try.' I know, for instance, that I am not a great artist, but I practice art anyway. I believe in the transformative power of art, and perhaps I was never skeptical about that, but I had long given up practicing because I was not great. I sat next to a kid in middle school who I saw had natural ability where I struggled, so I gave it up. But many years later I learned, again through my wife's then on-going training in non-verbal modes of therapy, which included creative arts, that the process of being creative can be therapeutic, whether or not one is great or even very good. So I picked it up again and discovered that I'm actually not bad. Yet I still struggle with the experience versus the product, always wanting to be great instead of letting myself practice. But it is coming.

I have always been fascinated by the evolutionary psychological studies of beauty and the model of it being somewhat based in bilateral symmetry. This makes intuitive sense, but, as those in the discipline have admitted, this is only part of the story. Beauty remains elusive, and, given such an elegant explanation as bilateral symmetry, it is hard to conceive of what more there could possibly be unless, for example, one draws representational faces. I find nothing more difficult and in some ways frustrating than drawing a face (well, one thing more frustrating is fluffy animals, whose defining features are microfeatures and in continual flux), but when I let myself practice instead of perfect,

I understand the subtlety of beauty. The slightest one millimeter extension or misdirection of a 2B graphite can twist a face horrifically. I exaggerate slightly, but 'horror' is the sensation I experience when I consider the person in question (as I was recently drawing someone I know) seeing their own depiction. The question is, is my knowledge of this fact different because of my experience of it than my having learned it in art history class or from an evolutionary psychology text? And the answer, as should be clear from the preceding dissertation, is yes, it is most certainly different.

The difference is that through the experience of drawing I have come to embody the sense of beauty and have a visceral sensation of something being wrong without knowing immediately what it is. But because of my years of practice and experience with what works and what doesn't work, I can quickly discern what went wrong with my hand and pencil, though I may not be able to put it into words. This doesn't mean I then know how to make it right and create a masterpiece, but I have come a long way.

Whereas the phenomenological paradigm bases knowledge in embodied experience, I lack this experience and suspect that, because I do not fundamentally agree with many of the socially conservative tenets of fundamentalist Christianity, I will continue to lack this experience. Yet I do not take the position that empirical, inexperienced knowledge is fundamentally wrong, just that it may be in some ways lacking. This betwixt and between problem is, as is well known, a long-standing argument and central to anthropological theory and method, so in many ways this goes without saying (is doxa to the field!). But it is important to point out, because embodying knowledge does not mean that a person automatically then understands that knowledge. For instance, my wife is a trained dance therapist and knows the theory behind what she

does, but when she works with clients, she does not consult the theoretical models in her head, she does not reflexively say anything like ‘I did a Chacian group today.’<sup>13</sup> She only does what comes naturally to her because of her many years of practice as a dancer and subsequently as a therapist. She went into dance therapy because she in many ways had already embodied it through her work as a modern dancer and training and internships in clinical social work. When she discovered that she could earn a Master’s degree in Dance/Movement Therapy, it was really a matter of getting the official seal of approval for a knowledge she already embodied. She sees when someone’s movement is joyful or when it is sad without resorting to theory. When I ask her how she knows, she provides a phenomenological description of her experience, not a theoretical one.

Granted, she is my wife, so I am biased, so let me provide a few additional examples, including one previously referred to and another straight out of today’s headlines. In chapter 2, I provided an example for multiple parallel processing of a musician playing guitar and singing onstage. Guitarists play by following the technical steps until, through experience, they embody the music and their bodies interact with the instruments to create the music. Thinking about playing, thinking about where one’s fingers should go next, as with guitar (as I have experienced, so I have acquired the knowledge that this is true), can cause them to mess up. And when one messes up, it is not an intellectual knowledge, it is more like the experience of pain, with the concomitant cringe in the body and face—i.e., missing a note is an embodied experience. Without knowing which note should have been hit and which note was hit instead, musicians discern what happened.

In a recent edition of *Newsweek*, columnist Jonathan Alter discusses President

Obama's initiative to make teachers accountable for the quality of education they provide (bravo). In so doing, he essentially says that good teachers are not merely those who graduate with a teaching certificate but who embody teaching. In point of fact, he says, quoting Barzun (1945), "they 'are born, not made'" (Alter 2009:22), but, until there is even a candidate gene model for teaching, I will make the assumption that Alter is merely being hyperbolic. Yet, what he invokes is a possibility of predisposition for teaching. Whatever that disposition might be (genetic, habitus), we will credit him with not hearkening to a by-gone era of nature versus nurture and suggest that he would instead have utilized the concept of "dual embodiment" if he possessed a pop analog in his rhetorical toolkit. In writing, the expression 'as anyone who has had the experience can attest,' is a tip of the hat to embodiment. It is a way of bypassing a tedious and obfuscating explanation to cut to quick and connect with those readers who have had a given experience and to shamingly insinuate to those who haven't that they should live a little and get the experience so they can better understand the text. It suggests that to 'get it,' one must have not only the intellectual or 'rational' knowledge of the event or activity, but also the limbic or 'emotional' experience. I invoke it here to say that, anyone who has taught a class knows that good teaching is an embodied experience. This is the purpose of internships in many fields, because experience brings theory home to roost, as it were. Teaching is an interaction with a group of students. Certainly there are instructors who spend a lifetime talking to a blackboard (or clicking the mouse of a Powerpoint presentation nowadays), but good teaching requires that one practice teaching and that one experience lessons that do not work to understand what does. This is the experience that will enable a good teacher to be able to discern the difference among

undergraduates between the bovine stare of indifference and a pique of interest penetrating a glassy countenance of sleepiness (which, admittedly, I am still practicing). But, again, as anyone who has taught knows, there is a lot of thinking on one's feet and saying things one never intended to say or realized had even been retained in one's brain until one is in front of a class trying to make a connection. Like the experience of Jesus, I imagine, it is akin to magic.

In one final example that resounds in our American national consciousness, Johnny Cash says in the song "Drive On," "It was a slow walk in a sad rain and nobody tried to be John Wayne/I came home, but Tex did not and I can't talk about the hit he got/But I got a little limp now when I walk/And I got a little tremolo when I talk/But my letter read from Whiskey Sam/You're a walkin' talkin' miracle from Vietnam/Drive on, it don't mean nothin'/My children love me, but they don't understand/And I got a woman who knows her man/Drive on, it don't mean nothin', it don't mean nothin', drive on" (1994). Johnny Cash was actually never in Vietnam, but he conveys through this song that the experience is embodied, is emotionally painful to talk about, and that words fail to convey the experience anyway. There is currently brouhaha over a video game in production of the battle of Fallujah (Ephron 2009). Vets who fought in this battle have been enlisted to make it as real as possible, but what will ultimately be lacking in this virtual experience is the embodied emotional experience (e.g., the revulsion of real horror). Movies like *Total Recall* and *The Matrix* have suggested this important aspect of embodied cultural phenomena, suggesting that to convince anyone to realistically experience a phenomenon, they have to believe in the reality of the experience and have the concomitant psychobiological reaction they would if it were real.

As outlined in chapters 5-7, Pentecostal discernment operates in the same manner. It appears magical in its powerfully transcendent capacity. In other words, one transcends mere practice, mere going through the motions, to discern the ways of God. This, I can easily imagine without the glossolalic experience but precisely because of other such embodied experiences I have had, as outlined in the preceding paragraphs, is a transcendent, emergent, and seemingly inexplicable experience, one for which mere words may scarcely do justice but which, I hope, can convey a close approximation.

## *2. FUTURE RESEARCH*

This study reflects the first phase of a project intended to analyze the effect of glossolalia not just between subjects but also, in future phases, within subjects over time.

Additionally, as a first effort entailing a unique design, several modifications are warranted. Nevertheless, the success of this design also validates its application to other contexts. And the global success of Pentecostalism, as outlined in chapter 4, warrants research in numerous dimensions, not the least of which is the biocultural effectors of health. Subsequent research objectives along these lines are briefly discussed in the following sections.

### *2.1 CULTURAL CONSONANCE*

Among the limitations of this study was the rapid ethnographic assessment. While rapid assessment can be quite fruitful, especially in the context of applied and medical anthropology (Bernard 2006), it can lead to superficial assessments of complicated relationships. This appears to be the case with regard to glossolalia and Pentecostal spirituality, as indicated by responses to the Faith Maturity Scale. As a general Christian measure of faith maturity, it asks about the importance of “religion” in the daily lives of

participants. While participants in the LGE group of this study tended to respond to the question as intended, those in the high LGE group were more reticent to simply answer that “religion” played a strong role in their lives. Many crossed out the word “religion” and wrote in “God” or simply answered “strongly disagree.” Future research will include developing a better metric for measuring Apostolic religiosity. Structured interviews will be conducted with participants in the current study wherein they will be asked a short series of questions intended to elicit emic Apostolic values, such as “What to you are the three to five most defining things about or that make you Apostolic?” or “What do you get out of being Apostolic?” These will then be coded to determine a short list of the most common beliefs or behaviors that define Apostolic spirituality and practice as the basis for questionnaires to be used in future research, both in following up with these participants and in comparative research among other Apostolic populations.

Additionally, a larger ethnographic survey can elucidate the relevance of the glossolalia typology outlined in the discussion of this study. A deconstruction of the habitus of Richie and Amanda was outlined as obtained through two interviews, but this is clearly not sufficient to understand the fuller extent of the historical processes that led to their experience as I observed it. To better understand this event would have required attending services at Amanda’s other church, visiting their home, and interviewing a wider range of informants, among many other opportunities. Yet, this incident was a historical accident, as was my presence at the time. I did not attend each and every service, so who knows how many such busy intersections incongruous with my typology I missed? The interpretive anthropological journey among Apostolic Pentecostalism, in a Geertzian sense, is admittedly barely just begun. Future research may include revisiting

this incident to better understand the historical intersection I observed, but this will only yield limited relevance to Apostolic Pentecostalism cross-culturally, so similar ethnographic endeavors will be pursued at the sites outlined below.

Much more qualitative work also needs be done regarding the concept of success and satisfaction in following this spiritual path. This study has outlined some of the habitus and suffering that lead people to pursue an Apostolic path to God and what constitutes appropriate and inappropriate behavior with respect to cultural competence, but there remains the question of how to define satisfaction, what it looks like, and how it is conveyed. For instance, do the brethren obtain satisfaction from glossolalia and, if not or in part, then what?

## *2.2 FOLLOW-UP WITH SAME SAMPLE (YEAR 2)*

A second set of measures will be taken from participants approximately one to two years after the original samples (the first set was collected over the course of a year, so it will be a measure of change over two years for initial participants) to measure within-subject variation in cortisol and  $\alpha$ -Amylase. This design is an effort to detect if allostatic change occurs in the set-points of biological stress response (baseline and activation levels) due to frequent or long-term practice of glossolalia. There are no guidelines in the literature suggesting how long it may take for the set-point of stress response activation to be changed, though repeated measures studies of Transcendental Meditation (TM) and cortisol found baselines decrease in TM groups as opposed to controls after four months. However, responsiveness to stressors among TM groups increased (MacLean et al. 1997).

This follow-up will test the hypothesis that continued glossolalia practice will influence reductions in cortisol and increases in  $\alpha$ -Amylase on Monday relative to the

year 1 sample.

### *2.3 COMPARATIVE WORK*

The conclusions reached in this study are tentative and require validation and additional qualitative investigation. The ecological context of this study for the population as a whole was not particularly stressful, as the quality of life in the mid-Hudson Valley is relatively good. Future comparative studies can contribute significantly to understanding the relationship of sub-domains of religiosity, like glossolalia, to stress and health by conducting research in environments that vary in their degrees of momentary and chronic stressors. Additionally, a thorough ethnography of these same congregations will provide a richer context for interpreting biological and psychological data. Whereas Csordas (1997a; 1997b; 2002) has provided such data with regard to Catholic Charismatics, Apostolics and other Pentecostals are different in many ways that limit the application of his work to ethnological biocultural analyses. A long-term immersion is required for such investigation, one that encompasses the entire spiritual community. This includes the home and work lives of the brethren, not just the church lives. Discussions with informants and other brethren, including an interview at one informant's barber shop, suggest that high and low LGE participants may differ dramatically in their behaviors and activities outside of church. It is also unclear how the brethren interact with those outside the church who are not Apostolic, including family members. To what extent are they evangelical? Data from the Religiosity Measures Questionnaire suggests that, at least among the congregations in this study, there is a limited amount of proselytizing and a containment of religiously-oriented behavior to the church and among other church members. Members of TAC participate in a cricket league, and, as I have been invited to

play with them, it would be interesting to compare the Apostolic team or team members to non-Apostolics, who are also mostly Caribbean.

Candidate field sites for this comparative research are Jamaica, Costa Rica, and the southern United States.

### *2.3.1 Jamaica.*

The primary field site for this research has been TAC, which, as indicated, is approximately 90% Jamaican immigrants. Most of these immigrants are from the same area of Jamaica, an area known as Manchester. When the main family of TAC moved to the mid-Hudson Valley, they sought to establish an Apostolic church with the same Caribbean flavor to which they were accustomed. This led to the establishment of the Church of Jesus Christ Apostolic in the same town, as mentioned in chapter 4 and, due to intra-church politics, the later establishment of TAC. As such, TAC maintains contact with churches in Manchester. Relatives of TAC members often visit and take part in services. These visits can last for months on end, meaning that TAC is effectively the church in the United States to which these individuals are members, while they simultaneously have a ‘home church’ in Jamaica when they return. At least one individual, an Evangelist by title and aunt of a TAC official, took part in the original study before returning to Jamaica.

By conducting research among a similar population in Jamaica whose primary difference is only immigration status, it will be possible to discern an affect of socioeconomic status on study outcomes that was not apparent in the relatively homogenous sample utilized. The brethren frequently suggest that I go to Jamaica to get an authentic or “real” Apostolic experience, and I have also been told that it is more

intense there because people feel they need God more in Jamaica. In the United States there are more institutional services for the problems of poverty, and poverty in the United States is completely different than poverty in Jamaica. In Jamaica, informants say, poverty means that you have no family, nowhere to turn. Many people have no employment and no money, but as long as they have family, they are able to eat and care for their children. In the United States, poverty is defined by being below a certain income level.

Therefore, I plan to establish a field site in the Manchester region of Jamaica. The pastor of TAC has offered to accompany me and serve as a gateway, whereby I can conduct similar research in the churches and area where he and many of the TAC brethren were raised. I have already met and established relationships with many Manchester Apostolics when they have visited. This will entail a preliminary site visit in January or July 2010 to acquire the necessary permissions and make arrangements for subsequent visits. The establishment of this field site will be part of a larger anthropological biocultural study of Pentecostalism that will entail training students in anthropological data collection and analysis. Initial funding for site setup has already been arranged through the University of Alabama. Grant funding for a long-term, multi-site research project is being sought through the Pentecostal and Charismatic Research Initiative (PCRI). The PCRI is sponsored by the John Templeton Foundation and Center for Religion and Civic Culture at USC and will provide up to \$3.5 million to support social science research on Pentecostalism and charismatic expressions of Christianity. It will be awarding up to seven grants to regional centers in amounts up to \$500,000 and up to 15 grants to individual scholars (including doctoral students) and research teams in

amounts up to \$100,000.

### *2.3.2 Afro-Caribbeans elsewhere (Costa Rica).*

Additionally, another comparative approach is warranted. Apostolic practices are purported to be the same around the world, but this is clearly not true. Cultural variables are important and have an affect on the interface with a church. For instance, the practice of head-covering by females among Jamaican Apostolics is not followed by non-Jamaicans for the most part. The bible passage (I Cor. 5:11 [KJV]) is ambiguous and does not specifically say “hats,” though this is primarily what is worn. Jamaican Apostolics readily admit that this is a “man-made rule,” not God’s rule, and that the Jamaican cultural precedent set at TAC may have caused people to be turned off to worship there. They prefer to be known simply as an “Apostolic” church and not a “Jamaican” or even “Caribbean” Apostolic church and are in the process of actively addressing this issue in bible meetings and youth services. They say that their manner of dress is a Jamaican Apostolic custom that they have brought with them but recognize that this may dissuade Americans who walk in the door seeking God may not return because this is a cultural change they are unwilling to make. They emphasize that only humans look at each others’ outside but that God looks at everyone’s insides, so they do not want an official dress code as church “rules.” Nevertheless, brethren from ALT who have attended TAC specifically chose ALT because they were not comfortable with these cultural differences. Presumably because of cultural differences, ALT and TAC have different flavors. It will therefore be useful to determine what role ethnic and cultural diversity plays in the outcomes of this study. Do cultural factors influence stress? Do they influence the Apostolic mode of stress reduction through receiving the Holy Ghost,

or the social support concomitant to acceptance?

To begin examining cultural difference, I will establish a field site in Costa Rica. Costa Rica was chosen for several reasons. The Afro-Caribbean region of Limón will provide a moderate level of cultural difference with respect to the United States or Jamaica. In other words, it will still involve several consistent features—Afro-Caribbean, Apostolic, English-speaking—while providing a significantly different cultural background by which to see difference in Apostolic practice alone—i.e., different Apostolic upbringing/tradition (probably depending on the missionary work that established it there) and different surrounding culture (Spanish-speaking Latinos and indigenous Costa Ricans). Additionally, Costa Rica is well-situated for anthropological research. It is a developed country with a stable infrastructure, allowing the safe establishment of a long-term field site that will be safe for students to travel to, to practice and learn anthropological methods and develop research projects. Pentecostalism is flourishing in Latin America, and many different types of Pentecostalism are practiced there, which will facilitate additional comparative work, both with regard to denomination and culture (e.g., it may be possible also to set up research among Spanish-speaking, Latino and indigenous Apostolics, as well as among Trinitarian Pentecostals and perhaps even Catholic Charismatics). Also, with regard to dissociation in general, indigenous shamanism is still practiced in Costa Rica, and it may be possible to utilize a similar research design to compare the traditional practice of shamanism to the relatively recent practice of Pentecostalism among individuals of a roughly similar cultural background.

In addition to the conveniences Costa Rica affords my research interests, it also

affords many logistic ones. The director of the archaeology division of the National Museum of Costa Rica, Ricardo Vasquez, is a friend and colleague who not only suggested this research be extended there, but has offered to guide and assist in the establishment of a field site. Also, The University at Albany is in the process of establishing field schools in Costa Rica in conjunction with la Universidad de Costa Rica to conduct four-field anthropology and provide exchange opportunities to train students at both institutions. Preliminary biocultural work has already been conducted under the direction of human physiologist Tom Brutsaert from UAlbany and one season of an archaeological field school in the Limón region completed in January 2009 under the direction of Mr. Vasquez and archaeologist Robert Rosenswig from UAlbany.

A preliminary visit to make contact with churches and acquire the necessary permissions will be necessary and is planned for either January or July 2010. This will be part of the larger multi-site project outlined above and will require the collaboration of other scholars to be manageable. However, the goal of both the Jamaican and Costa Rican sites will be to provide opportunities for graduate students to conduct research toward fulfilling the requirements for master's and doctoral degrees. Doctoral students will thus be encouraged to initiate research that they can continue in postdoctoral phases and as part of their subsequent careers. As will be discussed briefly below, there is a paucity of biocultural research with regard to Pentecostalism, thus a range of long-term research opportunities.

### *2.3.3 Southern United States.*

The southern United States is part of what is termed the 'bible belt' and features a higher degree of social conservatism and cultural religiosity than the relatively liberal and

secular Hudson Valley. There are numerous denominations of Christian fundamentalists in the South, including many Pentecostal. For instance, the snake handlers made infamous by Weston LaBarre's classic ethnography *They Shall Take Up Serpents* (1962) still practice in the Appalachian mountains of Georgia and Northeastern Alabama. One of the missionary churches that established Apostolics in Jamaica is based in Alabama. Future research in one or more of these churches could afford a within cultural comparison of the experience and data from the Hudson Valley study.

#### *2.3.4 Other types of Pentecostals.*

Pentecostalism is noted for its diversity, which is what, in part, has made it so successful. It can be adapted to many previous belief systems, a characteristic that leads it to vary dramatically in its practice across cultures. Pentecostal theologian Vinson Synan (2004) has noted that there is such variation between the practice of Pentecostalism in the United States and, say, Korea, that they appear to be completely separate religions. Even within the United States, the practices of Catholic Pentecostals and Apostolics appear to only share a bond as Christians, yet both are in fact Pentecostal. What unites them, says Synan, is the practice of charismata. So while it is possible that similar benefits of the charismata accrue to all Pentecostal groups—i.e., the benefits of glossolalia as evidenced in this study—the social contexts of these practices are very influential. We cannot make any a priori assumptions about the effects of glossolalia or other charismata across cultures or denominations without some evidence suggesting similar benefits. Therefore, it behooves us to conduct additional research utilizing the design outlined in chapter 4 to test the efficacy of glossolalia and other potentially stress-reducing sub-domains of religiosity among a variety of types of Pentecostals.

#### *2.4.5 Other traditions.*

In addition to other forms of Pentecostalism, numerous other types of religion utilize dissociation in the course of ritual practice. It is of interest to determine the affects of ideology on health-enhancing influences religious practice may have. For instance, it has been found that conservative religions produce greater positive changes in health than liberal traditions. Is this because conservative traditions are more attractive to people from lower socioeconomic strata, who lack resources and structure in their lives and also have more health issues in need of remediation? If these people who seek help from conservative traditions have more health problems than those who seek help from liberal traditions, there may be a greater rate of positive health outcomes associated with conservative traditions that has nothing to do with the religion per se. Or it may be that because conservative traditions enforce more behavioral restrictions, they reduce more risky behavior and actually do improve health more frequently. These liberal traditions also vary in their use of dissociative practices.

##### *2.4.5.1 Unitarian Universalists*

Unitarian Universalists vary greatly in their practices, serving in some cases as a spiritual community for those raised in Judeo-Christian traditions but averse to traditional Christian practices. As such, they tend to be among the most liberal Christian when viewed as a spectrum. There is no central utilization of dissociation, but I have known Unitarian Universalist churches to offer meditation classes and periods during services, as well as opportunities for members to engage in non-Christian religious dissociation rituals, such as pagan ceremonies involving drumming and dancing or American Indian sweat lodge ceremonies.

#### 2.4.5.2 Gnostics

There are few contemporary Gnostics in the historical sense, as Gnosticism was long ago purged from the Christian church. In many ways, the charismata of Pentecostalism are Gnostic practices that were jettisoned by Paul as distractions from the centrality of the relationship with God. Though a glossolalist himself, Paul observed that the Corinthian Christians had become more preoccupied with such Gnostic practices than their relationship with God and suggested they be suppressed, lest they lead Christians astray (Samarin 1972). Pentecostals have reasserted glossolalia and other charismata, but Apostolics view the liberalism that has entered some denominations of Pentecostalism and the use of charismata by Catholics and others as heretical. I submit that the contemporary pattern of Pentecostal diversity vis-à-vis charismata is in many ways analogous to Christianity's apostolic era in antiquity. Gnostic practices have found renewed interest after the discovery of the Nag Hammadi codices in 1945 (Blamires and Ross 2006). The Neo-Pentecostal and Charismatic Movements and reaction against them by fundamentalist Pentecostals like the Apostolics bear many similarities to the original schism between Gnosticism and what became orthodox Christianity. A few Gnostic groups exist around the United States and elsewhere that attempt to reassert Gnostic practices of antiquity by drawing on the Nag Hammadi. They have been translated, enabling contemporary scholars to gain perspective on Gnostic Christianity (cf. Pagels 1989). An analysis of these groups in relation to Pentecostalism could shed some light on the ancient tensions within Christianity and offer a health perspective on dialectically opposed contingents within Christianity.

#### 2.4.5.3 Buddhists

Buddhism also offers a rich avenue of research in this domain. Most of the health-related

studies of dissociation and religiosity have been done with regard to meditation, a practice extrapolated from Buddhism and Hinduism. It would be instructive to know how effective meditation is in a religio-cultural context. There are Buddhist temples in most major cities in the United States and around the world, so a study of this type can potentially be conducted anywhere. In the United States and Europe, Buddhism is generally viewed as a liberal tradition, as it does not involve a deity or supernatural spirits. As such, it tends to attract liberal devotees. The central practice of meditative dissociation combined with this more liberal ideology may offer a compelling contrast to the study of Pentecostal dissociation.

#### *2.4 ENERGETICS*

A question not sufficiently addressed by this study but which became an issue in the course of data collection is the affect of the physical activity of worship on stress reduction. Physical activity in general was considered, hence the collection of recreational and daily physical activity, but Pentecostal worship involves gospel singing and dramatic movement. Some individuals get filled with the Spirit, and I have observed them to run laps around the inside of church or to pogo in place. I have hugged brethren during the post-service fellowshiping and found them drenched with sweat, through their shirts and suit jackets. Given that some members attend services as many as 4-5 times a week, for 2-4 hours per service, this physical activity may have an affect comparable to aerobic exercise. A literature search found no studies conducted on the energy expenditure of religious ritual. A few studies of the affects of fasting during Ramadan on metabolic rate have been conducted (Husain, Duncan, Cheah, and Ch'ng 1987; Ramadan and Barac-Nieto 2001), establishing some methodological precedents,

and studies of performance, a classic topic of anthropological research, are akin to the singing and movement of Pentecostal ritual. This area represents a substantial gap in how religious practice may influence health, and, with regard to the study of Apostolics, a potential influence on stress levels that begs follow-up.

Future study could include utilizing nutritional and metabolic information to infer the energetics of religious ritual. Because of the activity level of Apostolics and the information already collected regarding stress and tongues, they represent an excellent population of study. It is difficult to obtain a sufficient sample size when requiring them to come into a lab, so a field design would need to be implemented. This could be done by utilizing epidemiological questionnaires to collect baseline health and nutrition data and a portable bioimpedance analyzer to establish body composition. Energy expenditure could be collected using a combination of self-reports for diet and activities and Actigraph accelerometers, which record the frequency and intensity of movement. Combining this information with data regarding religiosity and glossolalia experience and diurnal cortisol and  $\alpha$ -amylase would provide a unique and excellent portrait of the energetics of Apostolic ritual behavior.

### *2.5 EFFECT OF GOSPEL QUALITY ON TRANCE FORCE*

Music is an integral dimension of Pentecostal practice. Pentecostal services are primarily experiential, not just with regard to the direct experience of the divine through gifts of the Spirit but also through singing and movement. A church is said to be “Spirit-filled” if people are actively singing and moving. The style of music varies from church to church and with ethnic background. TAC includes many reggae elements in its gospel music and has a very talented gospel ministry. The music is of such high quality, it appears to have

a significant influence on the movement of the Spirit in the house and the embodied expression of Pentecostal habitus. This is a subjective evaluation based on visiting other churches, where the band and singers are clearly not as practiced, where the music is out of key, and the congregation seems to correspondingly lack the fervor of TAC. This introduces another dimension to stress reduction research in such religious ritual contexts. What role does the style and quality of gospel music play in the embodied experience and thus in reducing stress or enhancing mood or health? Music is used as a form of therapy and has well-established health benefits (Wigram, Pedersen, Bonde, and Aldridge 2002). Future research could involve developing a scale by which to evaluate quality, but, because taste is subjective, would have to do so in relation to the tastes of the members who are subject to the music. Questions to consider are, do people choose churches based on the style and quality of the music? It was certainly a factor in my choice of field site. Does an objective measure of quality (i.e., technical ability of musicians and tendency to stay in key, for instance) correlate with stress or mood among congregants? Is style or quality a factor in triggering trance or the movement of the Spirit?

#### *2.6 LABAN/BARTENIEFF MOVEMENT ANALYSIS OF RITUAL MOVEMENT*

Given the discussion of Apostolic movement in worship as potentially therapeutic from a psychodynamic perspective, a rigorous study is warranted. Laban/Bartenieff movement analysis was developed by Rudolf Laban, a dance artist and theorist interested in non-verbal communicative information, and extended by Irmgard Bartenieff. It is a system for observing, notating, and interpreting movement of all kinds. What makes Laban's theories interesting with regard to Pentecostal movement is his emphasis on space. He felt that human movement displays harmonious geographic tension with regard to space

(Thornton 1971). Pentecostals move in space with the guidance of God, from the emic perspective. Those filled with the Spirit may move energetically and with their eyes closed, but it is said that God will prevent them from getting hurt or hurting anyone else; whereas the same cannot be said for those faking or filled with any time of unholy tongues and trance.

I have a colleague certified in Laban Movement Analysis at Woodhull Medical Center in Brooklyn, NY, and TAC is affiliated with a Brooklyn Apostolic church. The two churches often send members to visit each other for fellowshiping, and it has been made clear that I could extend this Apostolic research to that Brooklyn church, which I intend to investigate further in June or July 2010.

### *3. ADJUSTMENTS TO CURRENT MODEL*

Insights from the study presented here will be used to improve this model for future research. Such improvements will include limiting the number of questionnaires administered so they can be part of a semi-structured interview process. This will prevent some of the issues such as a delay between biological measures and self-reports of stress, which can result in measures of independent stress events, rather than two vantages on the same ones. Additionally, participants in some cases did not read directions sufficiently and filled out questionnaires incorrectly or skipped pages altogether. The effort made to avoid this, to have participants fill out the questionnaires via the internet, was largely unsuccessful. Additionally, participants did not always understand the questionnaire items, or some items were too general and did not address Apostolic belief. This is an important issue, as religiosity was measured in conjunction with dimensions of glossolalia as a proxy of cultural consonance. It is plausible that a revised set of

questionnaires would make use of those items that were useful and dispense or edit those that were less so, in order to approximate a more precise measure of cultural consonance.

Future study utilizing self-collected biochemistry may also make use of technology that records the time a saliva swab tube is opened. Although participants were contacted at the collection time, it was clear from post-collection debriefing that they did not always perform the collection when they received the message. Sometimes collection occurred up to several hours later, and this discrepancy was not always recorded so it could be accounted for statistically. The utilization of time-stamping caps has been found useful not only in establishing an exact sample time but in improving compliance. When participants know their compliance will be checked later, compliance rates improve (Broderick, Arnold, Kudielka, and Kirschbaum 2004).

#### *4. IN CONCLUSION*

This dissertation has reviewed the motivation for this study of glossolalia and stress. It has defined dissociation and distinguished it from trance and the neural correlate of dissociation, deafferentation, as well as reviewed a number of types of dissociation across the continuum. It discussed dissociation as a mechanism to reduce or filter stress and reviewed the physiology of biological stress response to ascertain how this might be possible, as well as reviewing studies that have heretofore been conducted related to dissociative forms of stress reduction and health improvement. It discussed a theory as to why a special psychological mechanism might be necessary to reduce or filter stress, which is that human consciousness is inherently stressful and must be delimited. The key aspects of this consciousness and the delimited areas, SA and ToM, were reviewed in relation to their neurological locations, functions, and evolutionary significance.

Archaeological evidence for the development of these areas was discussed. A research project testing the stress-influencing potential of dissociation in a Pentecostal religious context was outlined, as well as the means by which stress, a fuzzy concept at best, is typically measured in such field studies. The data from the first phase of this study was presented, which indicated a difference in stress hormones suggesting a moderating effect of this culturally relative form of dissociation. The implications of this moderation were discussed, and a typology for this form of dissociation, glossolalia or speaking tongues, was described. The possibility that this form of dissociation might play another significant role besides stress reduction, that of moderating mood, was also discussed. Finally, future research was outlined.

This investigation has been extremely fruitful with regard to understanding not only in situ dissociation vis-à-vis stress reduction and health but in providing insight into the importance of closely analyzing the influences of the sub-domains of religious experience from as many vantages as possible. Those utilized in this study included ethnographic, biological, and psychological and benefited from those of cognitive neuroscience and sociology, among others. This integration proved critical, for example, in highlighting the oversimplicity of the study's a priori assumptions, a discovery that contributed integral insight and depth to what is only the beginning of a biocultural anthropological investigation of Pentecostalism. Additionally, this study shed much light on the pros and cons of the dissociation concept and suggests directions for future investigation and improvements, not the least of which is its own status of a "fuzzy concept" but one of untold significance to the human condition.

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## Notes

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<sup>1</sup> A testimonial is “a short, first-person narrative about the course of the individual’s own life, the trials and difficulties they have struggled with, the disappointing paths they once followed, the way the Good News came to them, and how the Spirit-wrought salvation has changed them” .

<sup>2</sup> The terms transcendent and transcendental as used here are defined in Merriam-Webster OnLine as “extending or lying beyond the limits of ordinary experience,” “*in Kantian philosophy*: being beyond the limits of all possible experience and knowledge,” and “being beyond comprehension.”

<sup>3</sup> It was used earlier by American physician Benjamin Rush (1812) to connote patients who were flakey or not quite right, who were probably suffering from manic attacks or schizophrenia (Carlson 1986; Martin 2001).

<sup>4</sup> Literalism may be more an indirect affect of trance and more a direct result of suggestibility. Some studies have found that the most highly hypnotizable people do not display literalism while hypnotized and that subjects asked to simulate hypnotism exhibit higher rates of literalism than highly hypnotizable subjects do (Kirsch and Lynn 1995; Lilienfeld and Arkowitz 2009).

<sup>5</sup> The term “ecstasy” refers to the suite of behaviors exhibited during intensive worship, broadly defined as “a state of being beyond reason and self-control... a state of overwhelming emotion...trance; *especially*: a mystic or prophetic trance” (Merriam-Webster On-line).

<sup>6</sup> It should be noted that this is a pop culture stereotype that is rarely used and, indeed, rarely needs to be used. As it is repetition that is key, people could even be hypnotized running on a treadmill or—as has actually occurred—on a stationary bike (Lilienfeld and Arkowitz 2009).

<sup>7</sup> In the context of this review, the term *shamanic dissociation* is preferred because SSC connotes a larger class of brain states, but I will use the term SSC because it is not altogether clear what aspects of SSC would be precluded from the narrower term shamanic dissociation.

<sup>8</sup>The name Sybil is an allusion to the Greek Sybil, which was the famous Pythian priestess at Delphi that utilized trance, possibly induced by gases created via geologic processes (Broad 2002), to prophecy events. In the movie, Sybil’s doctor, Cornelia Wilbur, is portrayed by Joanne Woodward, who played Eve in *The Three Faces of Eve*.

<sup>9</sup> Pentecostal scholar Grant Wacker (2003) notes a decided Pentecostal temperament, especially historically, but it is also evident that congregations differ in temperament, even among those in a sample as small as this study’s.

<sup>10</sup> Other terms less commonly used to connote the same concept include “mental-state attribution” (Gallup, Anderson, and Platek 2003), “first-order belief attribution” (Wimmer and Perner 1983), “second-order intentionality” (Dennett 1983), “the intentional stance” (Dennett 1989), “mindreading” (Whiten and Perner 1991), “anticipatory interactive planning” (Goody 1995), “mentalizing” (Morton, Frith, and Leslie 1991), “folk psychology” (Wellman 1990), and “social mapping” (Brereton 2000).

<sup>11</sup> This is my interpretation and integration of models, as Crick and Koch do not mention dissociation.

<sup>12</sup> Miller (Haselton and Miller 2006; 2001) argues that such an ability would have been selectively advantageous, demonstrative of potentially creative ways to provision. Sexual selection for such a trait in males might have spread more rapidly than in females because of the previously mentioned male drive for opportunistic mating and the rare male mating advantage (Ehrman 1972; Knoppien 1985). This does not preclude females from exhibiting creativity but suggests that females choose creative intelligence in males and then produce creative male and female offspring. Creative female offspring select equally or more creative males. Creative male offspring are selected by other females. Rapid selection events for advantageous traits like this may explain events of punctuated equilibrium (Gallup, personal communication), in which evolution is relatively slow but punctuated by rapid transformations.

<sup>13</sup> Marian Chace was a dance therapist who, in the 1940s, developed an approach emphasizing communication of feelings in group interaction (Chodorow 1991:30).