

SEEKING GENES GOVERNING ANOMALOUS EXPERIENCE: CORRELATIONAL MAPPING OF COMMUNITY SURVEY DATA

James McClenon, Ph. D.
Virginia Beach Psychiatric Center
1045 Back Road
Chesapeake, VA, 23322 USA
e-mail: beinghere@hotmail.com
757-230-1810

ABSTRACT

A pilot study was designed to locate genes governing anomalous experience. The study uses a variation of Pearlson and Folley's (2008) strategy for locating alleles (alternative forms of a gene governing hereditary variation) based on evolutionary theory. The pilot study was guided by two theories: (1) A sheep theory hypothesizes that ESP alleles provide sufficient benefits to overcome the costs of schizophrenia. (2) A ritual healing theory argues that genes governing absorption and dissociation provided evolutionary benefits to archaic humans exposed to childhood trauma and shamanic healing. The ritual healing theory hypothesizes that shamanic healing, practiced by Paleolithic hunter-gatherers over many millennia, selected for alleles shaping anomalous experience, hypnotic suggestion, shamanism, and spirituality (McClenon, 1997, 2002a). Pearlson and Folley (2008) propose correlational mapping (multidimensional analysis) of community survey data to analyze hypothesized allele markers. The pilot study discusses the sheep theory and ritual healing theory with regard to allele markers. These theories predict existence of alleles governing ESP, absorption, dissociation, transliminality, boundary scales, and other anomalous experiences. A questionnaire was designed to measure frequency of anomalous experience, psychological symptoms, shamanic variables, childhood and adolescent difficulty, and other variables thought correlated with psychological symptoms (McClenon, 2012, 2013). Between 2001 and 2006, the questionnaire was administered to a non-random community sample in northeastern North Carolina (N = 965). The hypothesized allele markers were evaluated through correlational mapping of the survey data. Findings are based on five correlational maps (previously unpublished): (1) Anomalous experience variables were highly correlated with each other. (2) Particular correlational clusters, which suggest possible underlying alleles, include "waking ESP, OBE, apparitions," "waking ESP, apparitions," and "waking ESP, paranormal dreams, apparitions." (3) Waking ESP and apparitions were highly correlated with shamanic variables but were generally not within shamanic variable correlational clouds. (4) Although waking ESP is highly correlated with schizophrenia symptoms, researchers have not uncovered major schizophrenia alleles. Failure to locate these alleles calls into question the sheep theory. (5) Cluster patterns suggest that the search for alleles associated with shamanic ritual will be fruitful. (6) Correlational mapping provides no evidence of a psi allele (waking ESP, paranormal dreams, PK). (7) Analysis provides a list of 16 variables most correlated with a "waking ESP, paranormal dreams, apparition" cluster. Although correlational mapping does not provide clear evidence for an ESP allele, these variables are possible allele markers. Pilot study results suggest theoretical revisions. A revised ritual healing theory hypothesizes that random genetic mutations are the source of anomalous experiences.

INTRODUCTION

Anomalous experiences are uncommon episodes thought to be beyond scientific explanation (Cardena, Lynn, and Krippner, 2013). This study reports on a pilot program designed to identify questionnaire markers most suitable for locating anomalous experience alleles (gene forms responsible for hereditary variation). The exploratory study follows the Pearlson and Folley (2008) recipe for locating schizophrenia alleles. This method was modified to seek anomalous experience alleles. The pilot study seeks answers to four central questions: (1) Which combinations of anomalous experience variables are the most likely markers for underlying alleles? (2) Do specific forms of anomalous experience share alleles with psychological symptoms? (3) Do variables related to shamanism (absorption, dissociation, transliminality, boundary scales) provide markers for underlying alleles? (4) Do anomalous experiences variables share alleles with variables related to shamanism? Pearlson and Folley (2008) focus on locating alleles rather than evaluating hypotheses. Locating alleles allows “reverse phenotyping,” leading to theoretical revision and better definitions of marker phenotypes.

Evidence supports the argument that anomalous experiences, such as spontaneous ESP, have genetic basis. Although experimental evidence regarding ESP in twins has provided mixed results (Charlesworth, 1975; Nash and Buzby, 1965), accounts of apparitions, waking ESP, paranormal dreams, OBEs, and spiritual healing reveal universal features, implying physiological, genetic basis (McClenon, 1997a, b; 2000, 2002a, b). Analysis of 130 Scottish families suggests that ESP is hereditary (Cohn, 1999). Folklore and anthropological literature from all over the world identifies recurring elements within anomalous experience and occult performance (Long, 1977; Thompson, 1955-1958). Folk traditions suggest that these skills can be inherited. Neppe and Hurst (1981) suggest that the heritability of subjective paranormal experience is related to temporal lobe functioning.

Theory and allele markers

Genetics researchers have devised standard procedures for locating alleles associated with psychological disorders, such as schizophrenia. Pearlson and Folley (2008) outline a plan for locating schizophrenia alleles using community survey data. Their recommendations can be adopted to seek ESP and other anomalous experience alleles.

Pearlson and Folley’s (2008) first stage requires an evolutionary explanation for how hypothesized alleles became prevalent. The “possible evolutionary mechanisms” must also explain “resulting relationships” (Pearlson and Folley, 2008: p. 930). Researchers seeking ESP alleles must account for how these genes were selected and how ESP became correlated with other variables during the human evolutionary process. Research indicates that the propensity for spontaneous ESP is correlated with schizotypy, symptoms associated with onset of schizophrenia (McClenon, 2012, 2013).

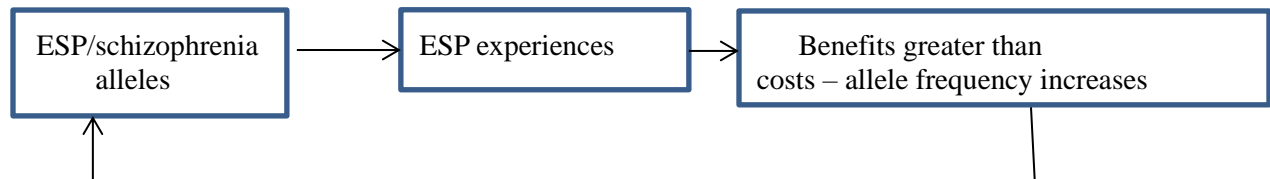


Figure 1: Sheep Theory

A sheep theory, designed for believers in ESP, specifies that ESP/schizophrenia alleles govern ESP experiences and incidence of schizophrenia (see figure 1). Since only a small percentage (perhaps 1%) of people in general populations suffer from schizophrenia, the sheep theory predicts that ESP evolutionary benefits are greater than schizophrenia’s costs. ESP provides information that contributes to survival (Kelly, 2010, 2011). The theory predicts that spontaneous ESP, and schizotypy (symptoms predicting risk of schizophrenia), are markers for the ESP/schizophrenia allele(s).

A hypothetical story illustrates this theory. A shaman goes into trance and sees a woolly mammoth in an unexpected place. As a result, he and his starving kinsmen find the animal, kill it, and eat the meat. The shaman’s children pass on the ESP/schizophrenia allele to future generations even though it confers risk of schizophrenia.

Additional benefits of the ESP/schizophrenia allele may include creativity, spirituality, and religiosity, all of which have been hypothesized to balance out the evolutionary costs of schizophrenia (McClenon, 2011). The theory explains the existence of ESP and the correlation of spontaneous ESP experience with schizotypy.

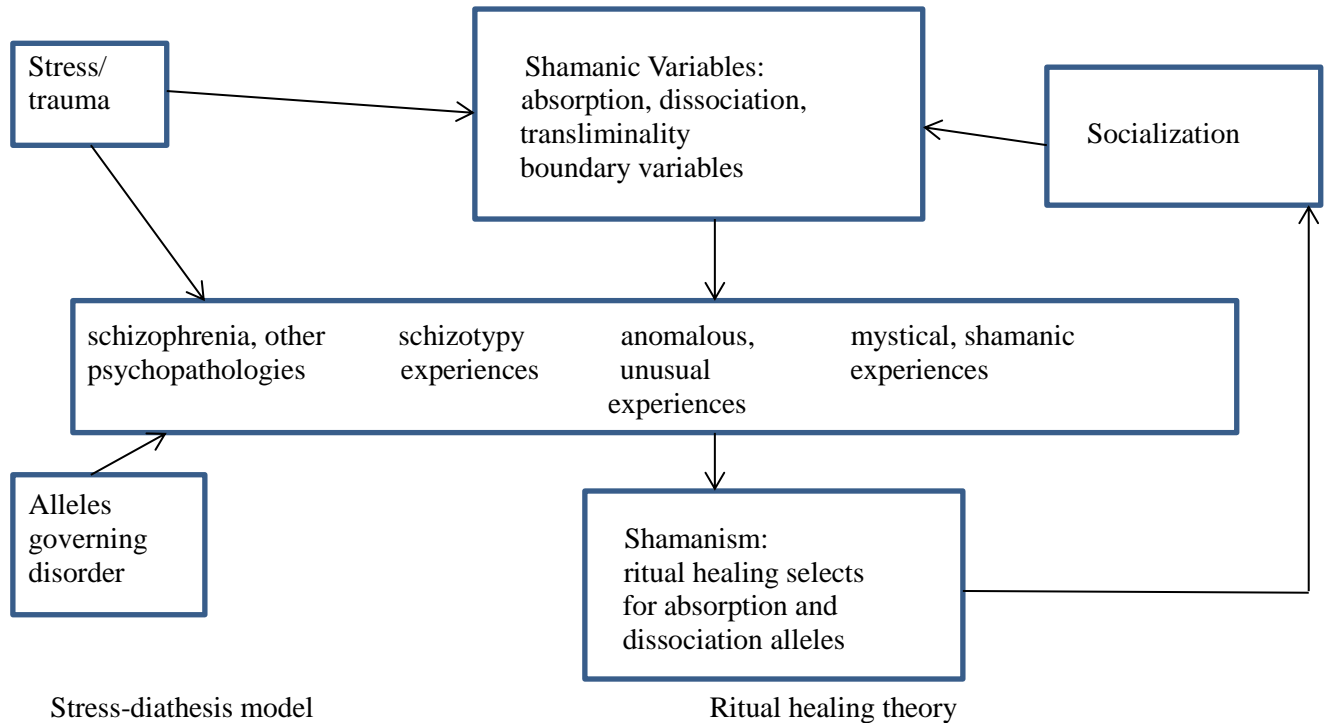


Figure 2: Stress-diathesis model and ritual healing theory

The ritual healing theory provides an evolutionary model specifying allele markers. Figure 2 portrays the stress-diathesis model, designed to explain psychosis, and the ritual healing theory, which specifies an evolutionary process shaping shamanism. The stress-diathesis model argues that genetically-prone individuals exhibit pathological symptoms after exposure to a threshold level of stress (Corcoran et al. 2003). Researchers have identified symptoms, schizotypy, which (sometimes) precede schizophrenia onset. Schizotypy is characterized by cognitive disorganization, magical ideation, nonconformity, and unusual experiences, some of which include anomalous experiences (Raine, Lencz, and Mednick 1995).

Figure 2 portrays a continuum (regarding self-control) of experiences that vary from schizophrenia, schizotypy, anomalous, unusual experiences, to mystical, shamanic experiences (Hay and Morisy, 1978; Lenzenweger, 2010; McClenon, 2002). Schizotypy experiences tend to have to be negative and out of control (“Felt that your mind was dominated by forces beyond your control”); anomalous experiences are more neutral (“How often have you had the following experience?” Apparition -- perceiving something through sight, sound, or touch that you later found was not completely real.” Although negative mystical experiences occur, some are psychologically healthy and under control (“I have experienced an altered state of consciousness which I believe utterly transformed -- in a positive manner -- the way I looked at myself”). Shamans bring on trance experiences at will. Newberg and d’Aquili (2008) suggest that some anomalous/mystical/shamanic episodes reflect a higher reality.

An innovative therapy paradigm supports the continuum theory (Clarke, 2010; Evrard, 2012; Mohr, et al., 2006; Moskowitz, Schäfer, and Dorahy, 2008). Although schizotypy is predictive of psychosis onset,

some forms of schizotypy are considered psychologically healthy, even beneficial (Boden and Berenbaum, 2004; Claridge, 2007, 2010, Clarke, 2010; Jackson, 2010, McCready and Claridge, 2002; Schofield and Claridge, 2007). Some anomalous experiences (particularly OBEs, NDEs, spiritual healing, and bereavement apparitions) have therapeutic value (Grimby, 1993; Kennedy and Kanthamani, 1995, McClenon, 2002b, McCready and Claridge, 2002, Palmer and Braud, 2002). Although the relationship between spirituality/mysticism and mental health is complex, features within mysticism are psychologically beneficial (Newberg and d'Aguili, 2008).

Researchers have documented correlations among all experience forms on the continuum (Berenbaum et al. 2008; Chapman et al. 1994; Corcoran et al. 2003; Lenzenweger, 2010; Read, van Os, and Ross 2005; Thalbourne and Delin, 1994). Although Stiffler, Greer, Sneek, and Dovenmuehle (1993) found that experienced contemplatives and psychotics could not be distinguished on Hood's (1975) measure of mystical experiences, each experience form differs. Psychotic self-experience differs from, and is less healthy than, mystical self-experience, which is far healthier (Hood and Byrom, 2010)

According to the ritual healing theory, childhood stress and trauma activate alleles governing dissociation and absorption (traits governing hypnotic susceptibility). These alleles contribute to psychological health. Ott, et al. (2005) have located a gene associated with the Tellegen Absorption Scale, a finding supporting the ritual healing theory.

The ritual healing theory argues that anomalous experiences generate folk beliefs in spirits, souls, life after death, and magical abilities – the ideological foundations for shamanism. Those with high propensity for ESP and OBE became the first shamans. Shamanic healing, effective due to hypnotic and placebo effects, provided survival advantages for those with absorption and associated alleles. Shamanic healing created a cycle, selecting for absorption and dissociation alleles which shaped the human capacity for hypnosis, shamanic experience, and spirituality. Ritual healing success results in cultural traditions (such as shamanism) which advocate socialization regarding shamanic skills.

An illustrative story portrays this evolutionary process. During early human evolutionary eras, as infant head size increased, archaic women experienced high mortality rates during childbirth. A Paleolithic shaman performed a hypnotic ritual for a woman experiencing childbirth complications. She relaxed and gave birth to a healthy infant. Another woman, lacking her capacity to respond to ritual healing, was less fortunate. The surviving woman's alleles were passed on to future generations, increasing the incidence of anomalous experience and effectiveness of ritual healing.

Pealson and Folley's (2008) argue that evolutionary theories must specify *endophenotypic markers*. These markers reflect symptoms or biological characteristics that are heritable, precede onset of the disorder, manifest whether the illness is active or in remission, vary within and between families, and are amenable to reliable measurement. According to Pealson and Folley's plan, potential markers can include questionnaire items but these variables should be evaluated through random community surveys to determine frequency and correlates among ethnic groups. Their plan, designed to locate schizophrenia alleles, can be adapted to the search for anomalous experience alleles.

Researchers have already established correlates of spontaneous ESP experiences within various populations. Studies reveal that: (1) People with previous ESP experiences are more likely to report future episodes than those reporting no experiences. (2) Those reporting one type of anomalous experience are more likely to report alternate types. (3) Psychological variables predicting anomalous experiences include absorption, dissociation, transliminality, and boundary questionnaire variables (McClenon, 2002, 2012, 2013).

Schizophrenia researchers have identified markers for schizophrenia and schizotypy experiences (Claridge and Beech 1995; Chapman, Chapman, and Kwapiil 1995). Pearlson and Folley (2008) predict that "the prevalence of single endophenotypic abnormalities [pertaining to schizophrenia] in the healthy community sample will be high, in the range of 15%–20%."

Researchers investigating anomalous experience have conducted parallel studies. Random sample surveys of anomalous experiences include Greeley (1975, 1987), Grimby (1993), Haraldsson (1985); Haraldsson and Houtkooper (1991), McClenon (1994, 2002a, b); Palmer (1979), Ross and Joshi (1992), West (1995). National surveys indicate that incidences of ESP in Denmark, Norway, Belgium, and the Republic of Ireland are low compared to other European countries (Haraldsson and Houtkooper, 1991)

and that USA incidence is comparatively high (McClenon, 1994). Certain subsamples reveal high incidence. Grimby (1993) interviewed 50 randomly selected widows and widowers in Sweden; 82% reported a sense of presence or hallucination form. Three random samples of Chinese college students show high incidence of ESP, OBE, and contact with the dead. A random sample of Japanese students reveal low incidence and three random samples of American college students reveal moderate incidence (McClenon, 1994). Elite scientists tend to report fewer episodes of ESP, OBE, and contacts with the dead than do mainstream scientists (McClenon, 1982, 1984). Although variations in experience incidence seem affected by environmental factors and methodological problems abound, pilot studies suggest that questionnaire items measuring incidence of spontaneous ESP are relatively valid (but see West, 1995). These variables are hypothesized to be allele markers, equivalent in quality to schizotypy questionnaire items.

Methodological strategy

Pealson and Folley (2008) advise using correlational mapping (multidimensional analysis) to analyze community survey data. This method identifies correlational clusters suggesting underlying allele markers. Multidimensional software programs produce a “map” of variables based on all variable correlations. Each variable is arranged on the map so that its proximity to all other variables corresponds with the size of its correlation with them. Small distances between variables indicate large correlations; large distances indicate small correlations. Clusters of variables, showing high correlations, imply they “are likely to share common risk genes” (Pealson and Folley, 2008: 930). Correlational mapping allows researchers to revise their theories if cluster configurations suggest alternative markers.

The use of correlational mapping for locating alleles is more useful than multiple regression analysis because the researcher must simultaneously evaluate many variables while granting equal weight to each. Pealson and Folley’s method works if the researcher’s theory links questionnaire variables with underlying alleles. The method assumes that alleles govern multiple characteristics and that correlational clusters of candidate variables indicate underlying alleles. Correlational mapping is particularly appropriate for pilot and exploratory studies. The parapsychological literature (Cardeña, Lynn, and Krippner, 2013) offers no physiological variables corresponding to spontaneous anomalous experience but suggests questionnaire variables useful for Pealson and Folley’s method.

The next research stage involves identifying samples with high and low marker incidence. DNA of family members with high marker propensity, for example, can be compared to first generation family members with low propensity. Community surveys facilitate assembling samples of high and low propensity individuals from general populations. Comparison allows researchers to locate candidate alleles. Replication of results with varying ethnic groups can confirm location of marker alleles.

A final stage involves reverse phenotyping, a procedure that reveals the actual functions of the allele (Schulze and McMahon, 2004). This stage allows revised definitions of the marker phenotypes, the observable characteristics resulting from the interaction of the gene and environment. Each stage -- marker identification, survey evaluation, and reverse phenotyping -- can result in theory revision and improved marker specification.

Special Issues

During the study period, schizophrenia researchers became increasingly disappointed with their failure to locate major schizophrenia alleles (Wade, 2009; Joseph, 2003). Heritability analyses indicate that schizophrenia has “overwhelmingly polygenic disease architecture” with perhaps thousands of alleles explaining small variance (Loh, et al., 2015: 1385). These findings cast doubt on evolutionary balance theories explaining schizophrenia (McClenon, 2011). Keller and Miller (2006) provide a polygenic mutation selection theory explaining this outcome. They hypothesize that cognition has evolutionary “added on” characteristics. Modules developing during later eras affect earlier modules. This creates an “upstream” and “downstream” situation in which random mutations in upstream mutations create cascades of failure within downstream modules. According to this model, psychiatric diagnosis categories do not

reflect underlying diseases. The constellation of symptoms labeled as “schizophrenia,” for example, are the result of the way modular systems fail when random mutations disrupt “upstream” modules. This theory explains why schizophrenia has genetic basis (random mutations) but lacks important underlying alleles.

The failure to locate important alleles has bearing on the sheep balance theory. The theory predicts existence of an ESP /schizophrenia allele but, since no major schizophrenia alleles have been found, this theory is cast into doubt. If schizophrenia alleles confer benefits, modern gene-hunting methods should have detected them.

A basic prediction of the ritual healing theory is that shamanic variables have underlying alleles. Ott, Reiter, Henning, Vaitl (2005) present evidence indicating an allele for the “absorption trait, hallucinogen effects, and positive symptoms.”

Methods

A 193-item self-administered questionnaire was devised to conduct correlational mapping of study variables. Variables, described more fully in McClenon (2012, 2013) include:

(1) Psychological Symptoms (Mirowsky and Ross (1989a); 81 psychological symptoms arranged into 11 diagnostic categories.

(2) Unusual experience (McClenon, 2012; 2013). 11 items define the experience and ask respondent about incidence of apparitions, waking ESP, paranormal dreams, out of body experience, near-death experience, psychokinesis, sleep paralysis, spiritual healing, unidentified flying objects (UFO), religious experiences, and “other” types of unusual experience (déjà vu, synchronicity, omens, anomalous natural phenomena, anthropomorphic perceptions, spontaneous spirit possession, and miscellaneous occult experiences). Unusual experience categories were derived from analysis of 1446 narratives collected in North Carolina (McClenon, 2012, 2013).

(3) Tellegen Absorption Scale (Tellegen and Atkinson 1974; Chronbach’s alpha = .84),

(4) 4 selected items from the Transliminality Scale (Lange, Thalbourne, Houran, and Storm 2000; Thalbourne and Delin, 1994).

(5) 7 selected items from the Boundary Questionnaire (Hartmann 1991).

(6) 4 selected items from the Dissociative Experience (Carlson et al. 1993; Bernstein and Putnam 1986).

(7) Childhood and adolescence difficulty (Boundary Questionnaire; Hartmann, 1991)

(8) High Blood Pressure Scale (Centers for Disease Control, 2008)

(9) Satisfaction with Life Scale (Pavot and Diener 1993; mean alpha = 0.78).

(10) John Henry Active Coping Scale (Ford, Hill, Butler, and Havstad 2002; alpha varied 0.66-0.80). This scale was designed to predict propensity for high blood pressure among lower SES African-Americans and correlates with a wide array of health status outcomes (Bennett et al. 2004; James, 1994; James, Hartnett, and Kalsbeck, 1983).

(11) 12 selected items from the Hostility Questionnaire; selected to measure factors related to physical and psychological health (Williams and Williams, 1994, p. 5-11).

(12) Items from the annual Centers for Disease Control (2008) questionnaire regarding (a): physical health, (b) psychological health, (c) present stress, (d) gender, (e) age, (f) ethnicity.

Transliminality, Boundary, and Dissociation scale items were selected on the basis of a pilot study designed to determine variables most correlated with hypnotic suggestibility (McClenon, 2011, 2011).

Questionnaire administration

Anthropology college students asked family members, neighbors, and friends to sign an IRB form, complete the questionnaire, and place the questionnaire in a sealed envelope. Afterward, the students interviewed each respondent regarding unusual or stressful experiences. They transcribed each interview and assigned the questionnaire and interview text an anonymous code number. This strategy allowed comparison of qualitative and quantitative response as a measure of validity – a possible problem with anomalous experience surveys (West, 1995).

RESULTS

Sample Characteristics

Respondent demographics reflect the composition of students and community members during the study period. Of 965 respondents providing information, 73% were African-American and 69% were female. Mean age was 33 years. Estimated median annual family income was \$27,372 with African-Americans reporting significantly less income than did Caucasians (African-American median = \$23,022; Caucasian median = \$41,557; chi sq. = 56.1, df = 4, p<.001). During the study period, USA median annual family income varied from \$49,455 to \$50,255 (2007 dollars), indicating that study median family income fell in the bottom USA quartile. Among those providing information, 13.5% were students and 40.1% were unemployed.

Unusual Experience Frequency

Unusual Experience	% reporting “once or twice” or “more often”
Paranormal dreams	66%
Apparitions	40
Spiritual healing	35
Sleep paralysis	35
Psychokinesis	34
OBE	29
Religious Experience	23
Other	22
Waking ESP	21
NDE	14
UFO	10

Table 1: Incidence within Unusual Experience Categories

Table 1 presents percentage of respondents reporting each unusual experience “once or twice” or “more often.”

Correlational mapping: previous findings (McClenon, 2013)

Figure 3 portrays correlational mapping of psychological symptoms and unusual experience variables, with unusual experiences circles above and schizophrenia symptoms circles below. In multidimensional scaling, the distance between variables represents the relative size of the correlation between variables; closeness indicates high correlation. Clustering was very important

within Mirowsky and Ross's (1989a) analysis, since they were concerned with the degree that psychological symptoms corresponded with diagnosis of particular psychopathologies.

Figure 3 replicates Mirowsky and Ross's (1989a) findings: psychological symptoms are arrayed in overlapping, loose clusters, forming a color wheel spectrum with ends connected. Schizophrenia symptoms (bottom circle in figure 3) are part of the psychological symptom cloud. The schizophrenia symptoms overlap other diagnostic category symptoms, such as paranoia, obsessive compulsive disorder, and manic behavior. All diagnostic categories overlap each other.

Mirowsky and Ross (1989b) argue that this configuration implies that psychiatric diagnoses are based on reified measurements. They contend that diagnostic categories impede understanding of psychological problems because the categories "are not something that is either present or absent" (page 11). Their findings support literature critical of the DSM paradigm (Hyman, 2010; Poland, Von Eckardt, and Spaulding, 1994). According to this paradigm, schizophrenia is not "real" but merely a collection of symptoms chosen arbitrarily by "experts." During the decades following the Mirowsky and Ross (1989a) publication, progress toward finding schizophrenia alleles has been disappointing (Wade, 2009), suggesting that no major alleles exist and that critiques of the DSM paradigm are valid.

Derived Stimulus Configuration

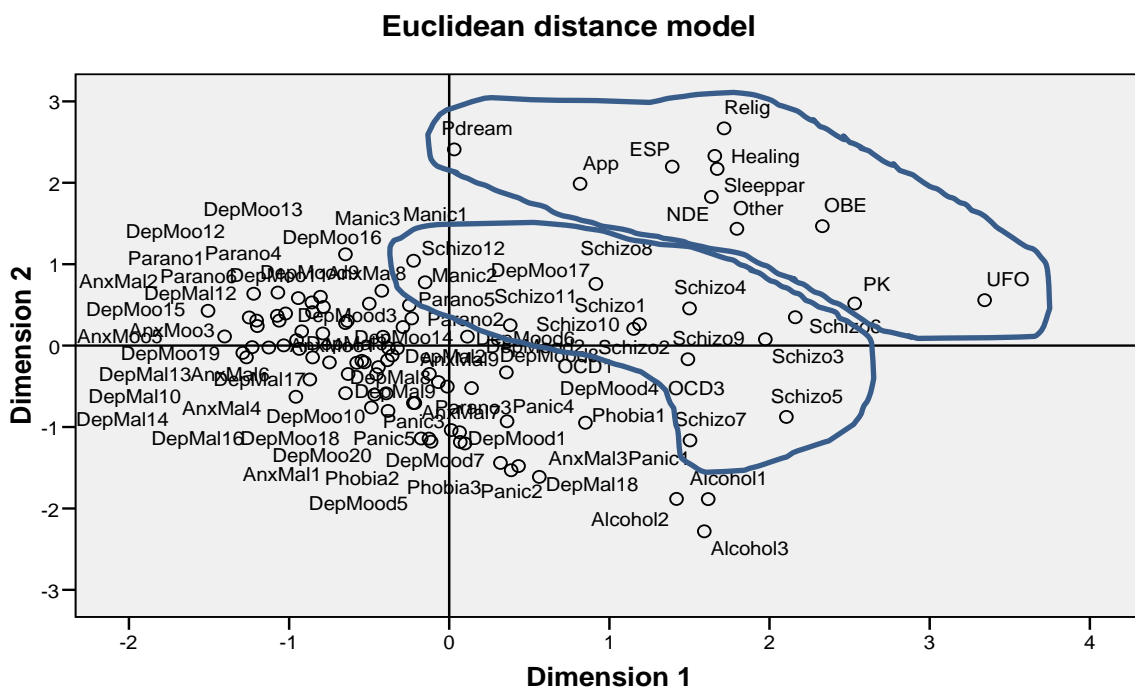


Figure 3: Correlational Mapping of Psychological Symptoms and Unusual Experience Variables (McClenon, 2013)

Figure 3, previously published in McClenon (2013), portrays the unusual experience variables as a loose cloud (upper circle), arrayed above the schizophrenia symptoms. The unusual experience cloud configuration might imply that these variables are markers for an underlying allele,

the looseness of the cloud suggests caution. Is the anomalous experience cloud sufficiently “tight” to infer that these variables are allele markers?

An “unusual experience scale” was constructed by summing variable values. Statistical measures evaluate the correlational “tightness” of the cloud, hinting at the quality of the variables as allele markers. Internal consistency is usually measured with Cronbach's alpha. Higher values are more desirable and a commonly-used rule of thumb regards 0.7 as “acceptable.” The anomalous experience scale exceeds that standard, having a Cronbach's alpha of 0.799. Caution is warranted because correlational mapping analysis requires theoretical guidance in marker selection.

Previous study conclusions (McClenon, 2013)

Analysis of 8 hypotheses pertaining to a sheep theory, goat theory, and the ritual healing theory gave mixed support for sheep and goat hypotheses but supported all ritual healing theory hypotheses (McClenon, 2013).

Quantitative Results

Although qualitative response corresponded with quantitative response, the methodology did not allow precise evaluation of questionnaire item validity. Many respondents described one experience verbally but reported multiple experiences quantitatively. Pre-test phase studies uncovered problems regarding the quantitative NDE question. Some respondents labeled their oral accounts as NDEs but did not mention an OBE or other-worldly visit as found in the NDE literature. They described mundane memories of feeling at risk of death. Within pilot study data, qualitative response did not detect this problem.

Pilot Study Results: Correlational Mapping

Figure 4 portrays a correlational map of unusual experience variables, revealing a larger cloud consisting of waking ESP, apparitions, OBE, paranormal dreams, and “other” experience and a smaller cloud containing waking ESP, apparitions, and OBE. Without a specific explanatory theory, it is unclear how to interpret these clusters. Should an “apparition/waking ESP/paranormal dream” variable be considered as an allele marker? It is not clear why these variables are clustered. A “waking ESP, OBE, apparition” category combines experiences that involve disruptions of the aminergic chemical system governing wakefulness (Hobson, 1994). Disruptions of the sleep/wake cycle and hypnogogic thought are correlated with anomalous experience (Simmonds-Moore, 2009, 2012).

Derived Stimulus Configuration

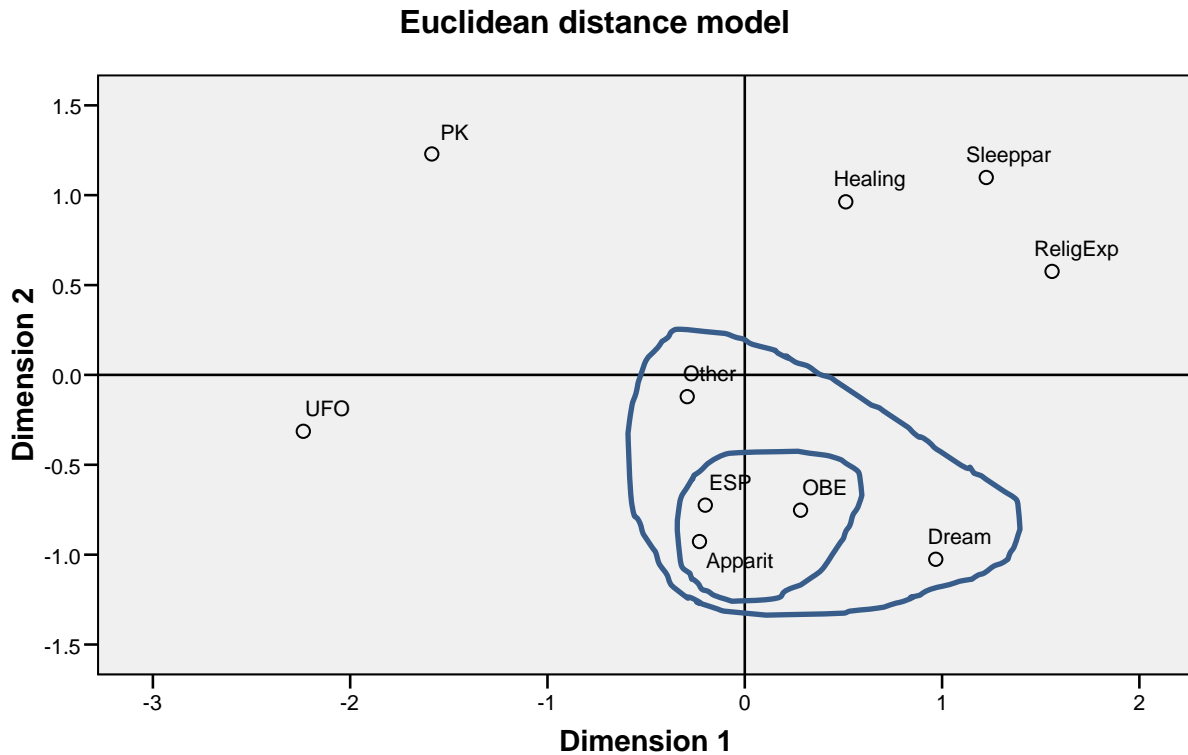


Figure 4 – Correlational Analysis of Unusual Experience Variables

[Apparit – apparitions; Dream – paranormal dream; ESP – extrasensory perception; Healing – spiritual healing; OBE – out-of-body experience; Other – other unusual experiences; PK – psychokinesis; ReligExp – religious experience; Sleeppar – sleep paralysis; UFO – unidentified flying objects]

The parapsychological definition of psi includes waking ESP, paranormal dreams, and PK. The correlational analysis does not portray these variables within a cluster, implying that the concept of psi is not a valid experiential category.

Derived Stimulus Configuration

Euclidean distance model

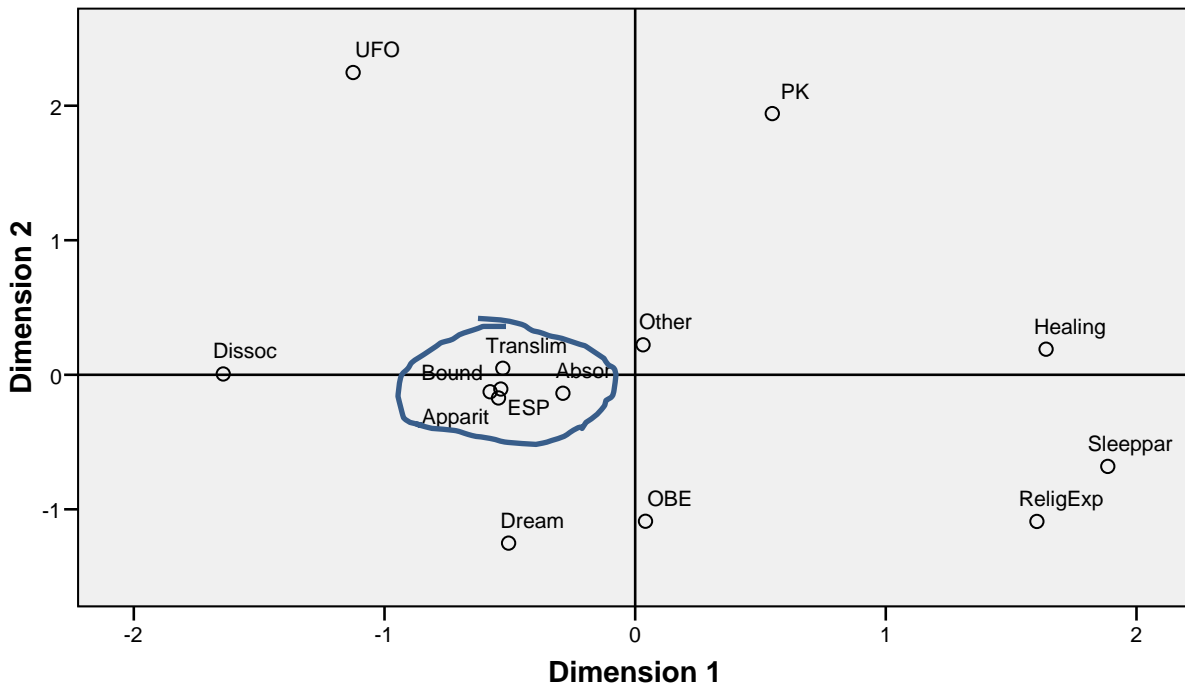


Figure 5: Unusual Experiences and Shamanic Variables

[Absor – Absorption Scale; Bound – Boundary variables; Dissoc – Dissociation variables; Dream - Paranormal dream; Healing – spiritual healing; Sleeppar – sleep paralysis; ReligExp- Religious experience; Translim – Transliminality variables]

Figure 5 reveals a cluster in the center left: Boundary, Transliminality, Absorption, Apparition, and waking ESP. Based on the ritual healing theory, the cloud suggests shared alleles, implying that waking ESP and apparitions may share an allele with the shamanic variables. Dissociation is not in this cluster.

As in the previous figure, waking ESP, paranormal dreams, and PK are not clustered, implying that these variables are not markers for a psi allele.

Derived Stimulus Configuration

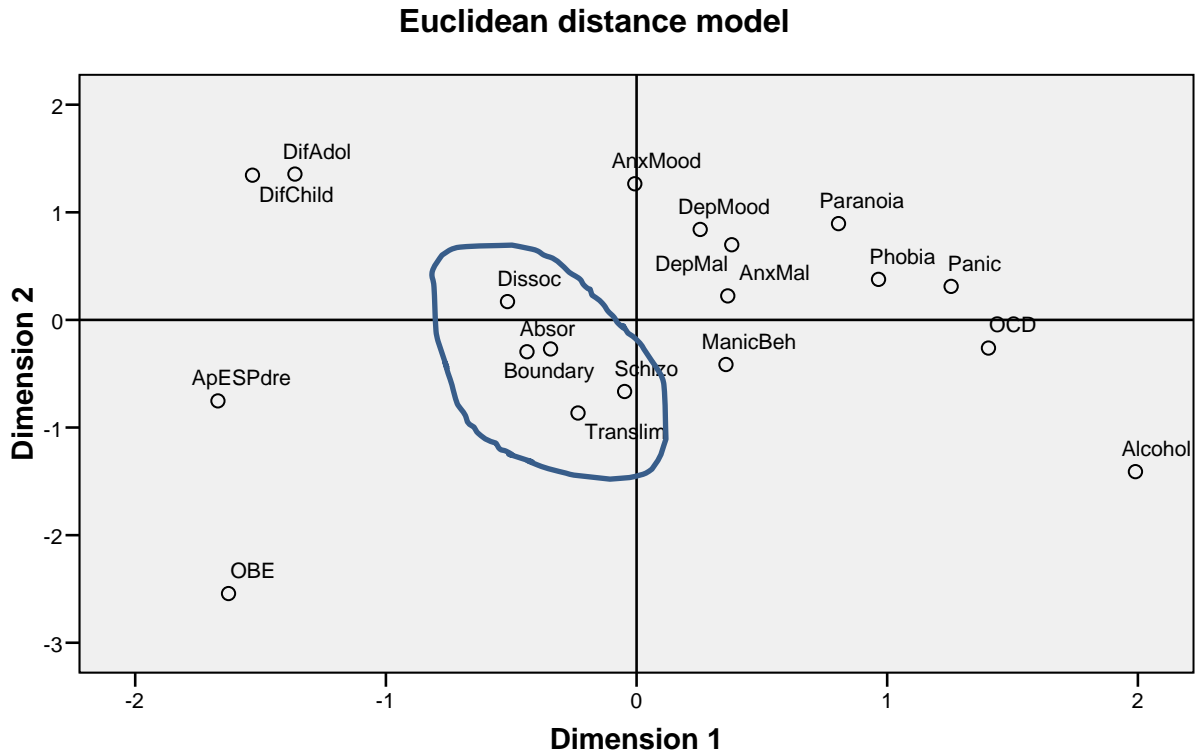


Figure 6: “Apparition/waking ESP/Paranormal Dream” variable, OBE, Shamanic Variables, Psychological Symptoms, and Childhood Difficulty

[ApESPdre – a scale consisting of apparitions, ESP, and paranormal dreams (categories thought to convey information paranormally)]

Diagnostic Categories: Alcohol – Alcoholism; AnxMood – Anxiety mood; AnxMal - Anxiety-malaise; DMal - Depression-Malaise; DepMood – Depression-Mood; ManicBeh – Manic behavior; OCD – Anxiety-Obsessive; Paranoia – Paranoia; Panic – Panic attack; Paranoia – delusional fear; Phobia – Irrational fears; Schizo – Schizophrenia]

Figure 6 portrays correlational mapping using an “apparition/waking ESP/paranormal dream” variable, an exploratory test of this variable’s usefulness. Shamanic variables (absorption, boundary, transliminality, dissociation) form a cloud clustered with schizophrenia, implying shared alleles (except for the fact that researchers have been unable to locate major schizophrenia alleles). The figure supports the argument that the shamanic variables are markers for a hypothesized allele. The “apparition/waking ESP/paranormal dream” variable is not within the cluster, implying it does not share an allele with the shamanic variables.

Derived Stimulus Configuration

Euclidean distance model

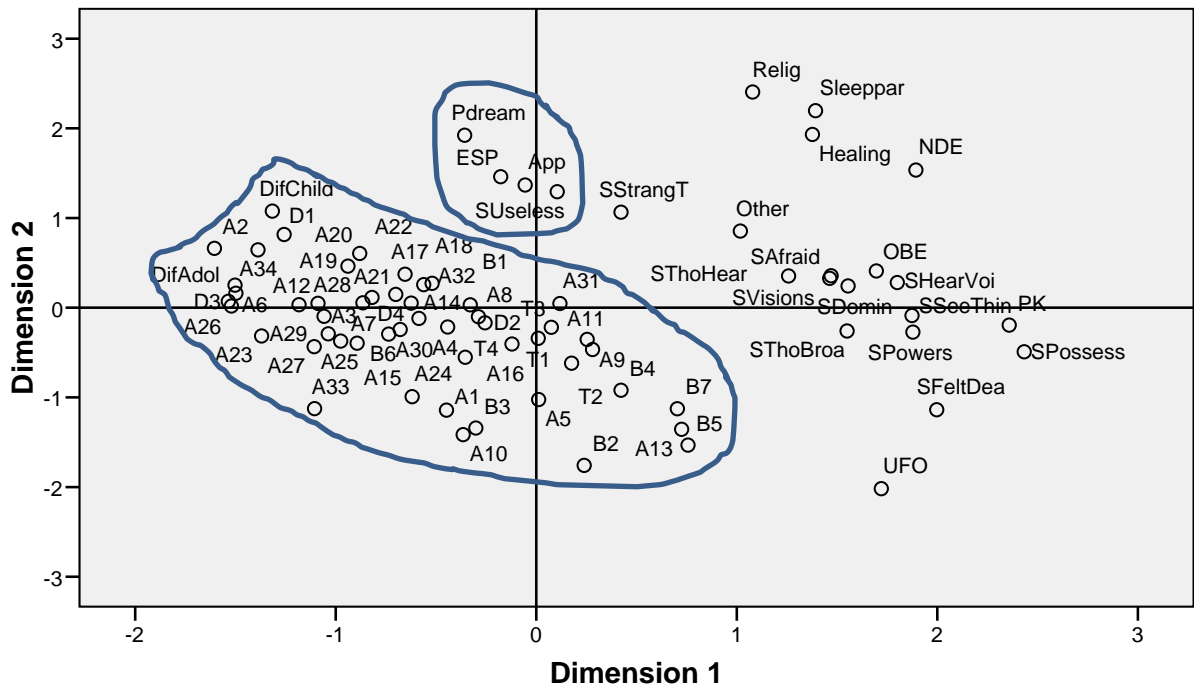


Figure 7 – Shamanic variables, schizophrenia, unusual experiences

- (1) Shamanic Variables (Absorption, Boundary, Dissociation, Transliminality)
- (2) Schizophrenia variables (SUseless, SStrangT., SThoHear, SAfraid, SVisions, SThoBroa, SPowers, SSeeThinPK, SPossess, SFeltdea)
- (3) Unusual experiences (ESP, Paranormal dream (Pdream), Apparitions (App), OBE, UFO, NDE, Spiritual Healing (Healing), sleep paralysis (Sleeppar), Religious experience (Relig), psychokinesis (PK))

Figure 7 portrays a correlational mapping of shamanic variables, schizophrenia, and unusual experiences. Shamanic variables are “unpacked” so that each questionnaire item constitutes a data point. The map reveals two marker clouds. The large cloud suggests that the shamanic variables share an allele. The cloud includes DifChild (difficulties in childhood) and DifAdol (difficulties in adolescence), a correlation predicted by the ritual healing theory. ESP, paranormal dreams, and apparitions are grouped in a smaller cloud with a schizophrenia symptom (“Had useless thoughts that kept running through your mind.”)

Further correlational mapping, not shown in a figure, compared “unpacked” anomalous experience and shamanic variables. The map revealed two separate clouds, implying that anomalous experience and shamanic variables do not share alleles.

Although figures 6 and 7 do not provide certainty that ESP, paranormal dreams, and apparitions share an allele with each other or with correlated variables, researchers may wish to search

for underlying alleles (ignoring correlational maps that imply no shared alleles). The “unbalanced” configuration of variables surrounding the upper correlational cluster suggests that variable markers are missing from the present analysis; the area above the cluster is empty. The 16 questionnaire items most correlated with the “waking ESP/paranormal dreams/apparition” cluster are:

Schizophrenia

1. Had useless thoughts that kept running through your mind
2. Had unusual thoughts that kept bothering you

Boundary Questionnaire

3. B1 I can visualize something so vividly that it is just as though it is happening right in front of me.

Dissociation Scale

4. D2 I have become so involved in a fantasy or daydream that it feels as though it were really happening to me.

5. D4 I find that I sometimes sit staring off into space, thinking of nothing, and am not aware of the passage of time.

Transliminality

6. T3. I have experienced an altered state of consciousness which I believe utterly transformed (in a positive manner) the way I looked at myself.

Tellegen Absorption Scale

7. A8 I think I really know what some people mean when they talk about mystical experiences.

8. A14 I can often somehow sense the presence of another person before I actually see or hear her/him.

9. A17 Different colors have distinctive and special meaning for me.

10. A18 I am able to wander off into my thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.

11. A19 I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.

12. A20 Things that might seem meaningless to others often make sense to me.

13. A21 While acting in a play I think I could really feel the emotions of the character and “become” him/her for the time being, forgetting both myself and the audience.

14. A22 My thoughts often don’t occur as words but as visual images

15. A31 At times I somehow feel the presence of someone who is not physically there.

16. A32 Sometimes thoughts and images come to me without the slightest effort on my part.

Figure 8 shows correlational mapping of unusual experiences, shamanic variables, psychological symptoms, and a variety of variables correlated with mental and physical health: John Henry Scale, JohnH; physical health (PhyH), psychological health (PsyH; measured in days per month lost due to a disorder), age, religiosity (Religion), Hostility Scale (Hostile), family income (Income), and high blood pressure (HBP).

The figure reveals a correlational cloud that includes shamanic variables, schizophrenia (Schizo), ESP, Apparitions, PK, other unusual experiences (Other), sleep paralysis (Sleeper), OBE, and spiritual healing (Healing). This constellation suggests that common factors influence these variables, causing them to be correlated. The ritual healing theory suggests that the evolutionary impacts of shamanism have contributed to these correlations.

Previous studies indicate that family income is highly predictive of physical and psychological health and particularly of schizophrenia onset (Hudson, 2005; Werner, Malaspina and Rab-

inowitz, 2007). Figure 8 reveals that the cloud variables have almost equal predictive capacity regarding “days lost” to mental disorder. On-going studies (for example, COPE, Center Of Prevention and Evaluation) seek to reduce onset of schizophrenia by treating people at-risk of disorder onset. Researchers have devised profiles listing variables correlated with disease onset but have not focused on the pilot study variables. Figure 8 suggests asking about shamanic variables and history of anomalous experiences as part of the evaluation process.

Derived Stimulus Configuration

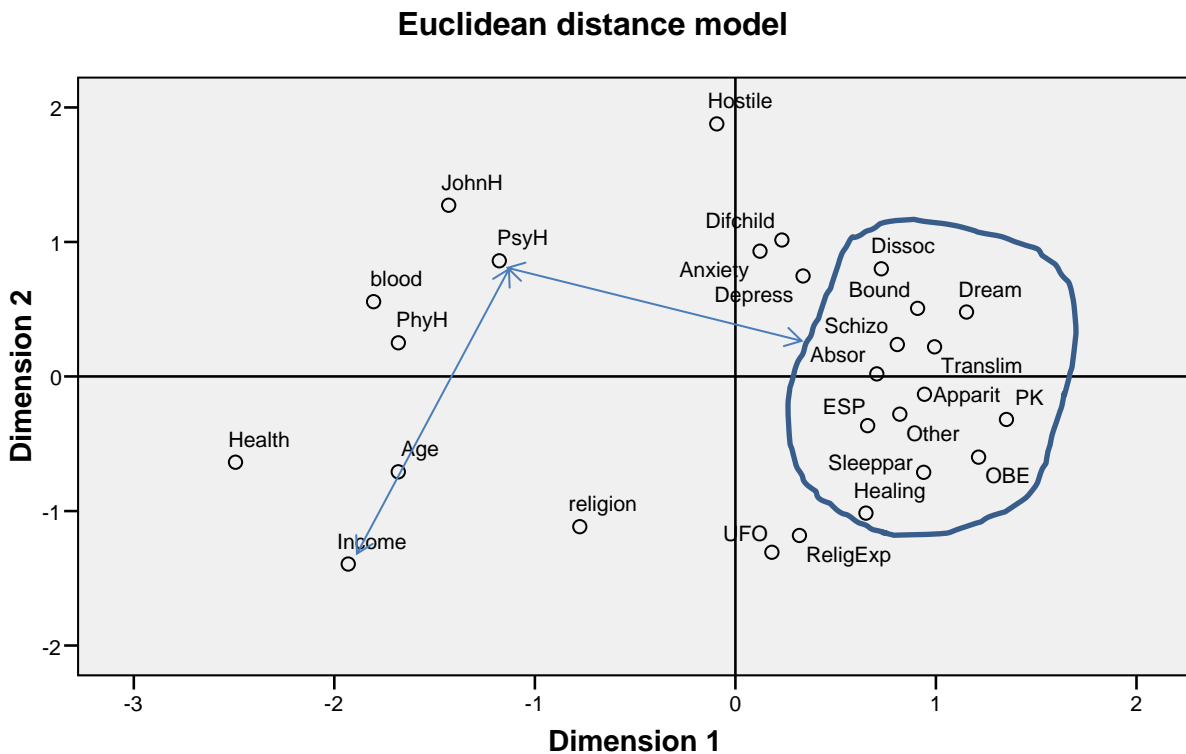


Figure 8: Variables Predictive of Psychological Disorder

DISCUSSION

Correlational mapping

Analysis of the five correlational maps provides topics for discussion:

- (1) Figures 3 and 4 portray high correlations among all anomalous experience variables (Cronbach’s alpha = 0.799). The high correlations do not fit folklore theories regarding these episodes. If UFOs are extraterrestrial travelers, for example, why do they appear more frequently to ESP, PK, and OBE experiencers than to other people? The ritual healing theory argues that shamanic alleles cause some people to be more open to anomalous

- experience. Although this implies shared alleles, correlational mapping does not provide strong evidence that anomalous experiences share alleles with shamanic variables.
- (2) Failures to locate major alleles governing schizotypy and schizophrenia suggest modifying the study theories. ESP/schizophrenia alleles (figure 1) should have been located through modern gene-hunting methods. Apparently, they do not exist. Figure 2, portraying the stress-diathesis model, refers to “alleles governing disorder.” Apparently, major alleles do not exist.
 - (3) Figures 5 and 6 portray shamanic variable clusters. These configurations suggest that searching for shamanic variable alleles will be fruitful. Ott, et al. (2005) have located an allele associated with the Tellegen Absorption Scale.
 - (4) Correlational mapping sheds light on which unusual experience variables are likely to share alleles. Theories are required to explain configurations. Figures 3, 4, and 5 reveal that the parapsychological concept of *psi* (waking ESP, paranormal dreams, and psychokinesis) does not correspond to correlational clusters. Psi should not be regarded as an experiential variable. Figure 4 portrays a cluster containing waking ESP, apparitions, and OBE. These episodes may be triggered by irregularities of the aminergic brain system, governing waking consciousness. During the waking state, thoughts, images, emotions (some of which can be highly creative and anomalous) continually emerge into consciousness. Disruptions of normal processes may facilitate anomalous experiences. Figure 5 shows waking ESP and apparitions within a shamanic variable cloud, suggesting shared alleles. Additional correlational mapping (unpublished) shows shamanic variables and experience variables as separate clouds, reducing faith in shared alleles. Figure 6 shows an “apparition-waking ESP-paranormal dream” variable outside the shamanic/schizophrenia cloud but close to it (implying that the construct does not share alleles with the shamanic variables). Figure 7 shows apparitions, waking ESP, paranormal dreams clustered together above the shamanic variable cloud but not within it (reducing faith in the shared allele theory). Figure 8 shows the apparition, waking ESP, paranormal dreams, and OBE within a shamanic variable/unusual experience cloud. Correlates with the “waking ESP-paranormal dream-apparition” variable were provided since these variables have received special attention within the field of parapsychology.
 - (5) The figure 8 correlation between the experiential/shamanic cloud and mental disorder onset (PsyH) requires discussion. Many people with high levels of schizophrenia symptoms, anomalous experiences, and shamanic variables, do not seek treatment. Many would probably benefit from preventive measures. Cost/benefit studies could evaluate the usefulness of programs designed to reduce risk of onset. Treatment might be similar to Alcoholics Anonymous programs. People who have achieved mental well-being through ritual, meditative, or shamanic practices may be best able to help those at risk.

Theory revision

Keller and Miller’s (2006) polygenic mutation selection theory was published while the study survey was being administered. Their model provides an alternate way of thinking about anomalous experience. If random genetic mutations create cascade failures within consciousness modules, these failures would affect anomalous experiences.

A revised ritual healing theory replaces the cell “alleles governing disorder” with “random genetic mutations.” The revised theory suggests that ESP, and related anomalous experiences, do not have specific underlying alleles but are the product of random mutations. Cascade failures produce the experiences on the theory continuum, none of which have underlying alleles. Waking

ESP, for example, could be explained as a product of disruptions to the system governing waking consciousness. Anomalous experiences do not require actual cascade failures but may be products of disruptions within the sleep/wake cycle, hypnogogic thought, and other mild altered states of consciousness (Simmonds-Moore, 2009, 2012). Just as Ganzfeld programs contribute to ESP incidence, random genetic mutations may disrupt normal consciousness in ways that facilitate ESP. According to the revised ritual healing theory, these disruptions are moderated by shamanic variables.

The theory also coincides with Asian folklore. Normal consciousness is considered an obstacle to paranormal cognition. Random genetic mutations disrupt normal consciousness which contributes to childhood difficulty, triggering shamanic variables which facilitate ESP. This revised theory explains why schizophrenia symptoms and pilot study experience variables do not always cluster closely or consistently. As with diagnostic categories, anomalous experience clusters are merely a product of cascade failures.

This theory does not deny the authenticity of paranormal claims. Correlational maps, although portraying schizophrenia-anomalous experience correlations, indicate that virtually all anomalous experiences are separate from psychological symptom clusters.

The alternate ritual healing theory coincides with the anthropology of spiritual healing. Healers are often afflicted by physical or psychological difficulties that resist treatment through standard medicine. The revised theory argues that these problems, associated with genetic mutations, childhood difficulty, and stress, can be alleviated by ritual practice. Carl Jung referred to this as the “wounded healer syndrome.” The potential healer benefits from spiritual socialization, a process that shuts down dysfunctional modules through ritual discipline. As a result, the potential healer experiences anomalous episodes which compel powerful beliefs in spirits, souls, life after death, and magical abilities. Such beliefs allow the healer to inspire hypnotic and placebo effects in others. According to this theory, anomalous experiences are facilitated through disruption of normal consciousness rather than activation of underlying alleles.

This theory explains the correlation of anomalous experience with schizophrenia, schizotypy, shamanic variables, and mysticism. It explains high correlations among unusual experiences with diverse explanations. The theory explains correlational map patterns within the pilot study data: anomalous experiences were correlated but loosely grouped. It predicts continued incidence of anomalous experiences within all societies, even those where reporting is stigmatized. It advocates use of anomalous experience as a marker variable guiding therapy. It predicts discovery of further alleles related to shamanism and that searches for anomalous experience alleles will fail.

Methodological Critique

The study sample was not randomly selected and the degree that these findings can be generalized to other samples is unclear. Correlations between psychological variables differ among cultures (Leff 1981, p. 47-49). The economically disadvantaged, predominately African-American sample is at higher risk of psychological symptoms than national samples. Qualitative narratives tend to have more negative affect than equivalent accounts in other collections of anomalous experience. For example, OBE and NDE accounts within this sample revealed higher incidence of fearful emotions, probably a reflection of higher stress, than in other anomalous experience collections (McClenon, 2002b).

Although correlational mapping should be regarded as superior to multiple regression analysis, evaluations of correlational clusters are based on arbitrary criteria. We cannot determine if markers selected to find alleles are valid without an allele search.

The survey questionnaire included items borrowed from other scales, a practice that may bias results. Positioning of variables within the questionnaire may have contributed to response bias, affecting correlations. Study methodology involved student interviewers and interviewer selection of respondents, factors that may bias results. Qualitative evaluation of the quantitative scale was not precise.

Conclusion

A pilot study, based on Pearlson and Folley's (2008) suggestions, allows analysis of possible ESP and anomalous experience allele markers. Replication of the Mirowsky and Ross (1987) symptom map reveals a loose cloud of schizophrenia variables and a separate cloud of anomalous experience variables, possible markers for underlying alleles (Figure 3). Five correlational maps reveal variations in configuration, suggesting difficulty in locating alleles. Previous researchers' problems in locating schizophrenia genes provide a warning to those searching for ESP alleles.

Pilot survey data provide tentative answers to the following questions:

(1) Which constellations of anomalous experience variables are the most likely markers for underlying alleles? Study results provide no evidence supporting the idea that psi, as defined by parapsychologists (waking ESP, paranormal dreams, and psychokinesis) has underlying alleles. Correlational clusters suggesting possible underlying alleles include "waking ESP, OBE, apparitions" (figure 4), "waking ESP, apparitions" (figure 5), and "ESP, paranormal dreams, apparitions" (figure 7). Pearlson and Folley (2008) stress the need for a guiding theory when seeking allele markers. Correlational mapping reveals waking ESP, paranormal dreams, and apparitions as highly correlated with shamanic variables, in harmony with the ritual healing theory (figure 7). The pilot study provides 16 variables most correlated with the "waking ESP-paranormal dream-apparition" variable. The configuration suggests that additional or alternate variables may be required.

(2) Do specific forms of anomalous experience share alleles with psychological symptoms? In general, anomalous experience variables are correlated with schizophrenia (figure 3). Although the sheep theory predicts existence of an ESP/schizophrenia allele, researchers have not located major schizophrenia genes. This failure reduces faith in the sheep theory; it suggests that ESP and schizophrenia do not share major alleles since none have been found.

(3) Do shamanic variables provide markers for underlying alleles? As predicted by the ritual healing theory, correlational mapping of community survey data revealed relatively tight clusters of variables related to shamanism. These results suggest that the Tellegen Absorption Scale and selected questions from the Dissociation, Transliminality, and Boundary Scales provide markers for underlying alleles.

(4) Do anomalous experience variables share alleles with shamanic variables? Anomalous experiences are correlated with shamanic variables but are not often found within shamanic experience clusters. The evidence suggests that these variables do not share alleles but research locating ESP alleles would shed light on this issue.

An alternate ritual healing theory, in harmony with Keller and Miller's (2006) arguments, suggests that anomalous experiences are not governed by specific alleles but are the product of random genetic mutations. Spontaneous ESP, for example, may be a product of disruptions of the normal waking consciousness system due to random genetic mutations. This theory argues that alleles related to shamanism were selected due to their capacity to reduce the evolutionary costs

of random genetic mutations. This has resulted in an evolutionary process that includes the wounded healer syndrome, a cultural product of anomalous experience.

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