

THE EVOLUTION OF BELIEFS IN GOD, SPIRIT, AND THE PARANORMAL. II: TRANSLIMINALITY AS THE MEDIATING FACTOR

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ABSTRACT: Ritual healing theory proposes that the evolution of beliefs in paranormal and spiritual phenomena was the result of selection for genes related to the trait of hypnotizability, as hypnotizable individuals were more likely to benefit from shamanic healing rituals. Hypnotizability is one component of a superordinate trait dimension, transliminality, which also includes positive schizotypy, paranormal beliefs, creativity, fantasy-proneness, absorption, and sleep-related anomalous experiences. Measures of each of these traits are highly correlated with each of the others, and factor analyses reveal a single underlying dimension. A revision of ritual healing theory is proposed in which hypnotizability is replaced by the broader construct of transliminality as the critical mediating factor.

Keywords: evolution, paranormal belief, hypnotizability, schizotypy, transliminality

Ritual healing theory (e.g., McClenon, 1997) proposes that beliefs in God, spirit, and the paranormal are derived from anomalous experiences occurring in the context of altered states of consciousness induced by shamanic healing ritual. Individuals with high levels of trait hypnotizability were more susceptible to the healing benefits of shamanic ritual, so the genetic factors contributing to hypnotizability were selected during the course of human evolution, leading to more widespread anomalous experiences, and promoting the development and maintenance of beliefs in paranormal and spiritual phenomena. Hypnotizability is highly correlated with paranormal belief and experience, positive schizotypy, fantasy-proneness, and creativity, which are also highly intercorrelated. These traits comprise a superordinate trait dimension, termed “transliminality” (Thalbourne, 2000b). A revision of ritual healing theory is proposed, replacing hypnotizability with transliminality as the mediating factor.

PARANORMAL BELIEF

Popular belief in the paranormal is highly prevalent (Diaz-Vilela & Alvarez-Gonzales, 2004; Ede, 2000; Eve & Dunn, 1990; Gallup & Newport, 1991; Greeley, 1975; Kallery, 2001; Musella, 2005; Newport & Strausberg, 2001; Orenstein, 2002; Rice, 2003; Vyse, 1997; Yates & Chandler, 2000; Zusne & Jones, 1989). Paranormal experiences such as precognition and telepathy are also frequently reported by members of the general population (Blackmore & Troscianko, 1985; Hearne, 1984; Jones, Russell,

& Nickell, 1977; Rattet & Bursik, 2001; Ryback & Switzer, 1989; West, 1995; Zusne & Jones, 1989). Although there is no definition of “paranormal” which yet shares a wide consensus, many assessments of paranormal beliefs (e.g., Newport & Strausberg, 2001) commonly operationalize the concept of paranormal in terms of a wide variety of phenomena, including telepathy; clairvoyance; psychokinesis; precognition (these four are referred to as “psi” phenomena in the parapsychological literature); ESP; mental or spiritual healing; other psychic, “shamanic,” or “siddhi” powers, including levitation, pyrokinesis, distant healing, soul travel (or astral projection, associated with out-of-body experience), transubstantiation or transmutation of matter (e.g., changing water to wine), teleportation, prophecy, control of weather, communication with animals and plants, shapechanging; as well as beliefs in the survival of consciousness after physical death (i.e., life after death), reincarnation, communication with the dead, channeling; apparitions or ghosts; hauntings; poltergeists; the reality of spiritual entities such as angels, demons, spirits, gods, and goddesses, meeting God in the afterlife, the reality of a spiritual dimension of existence; intelligent life elsewhere in the universe, UFOs, alien abduction or contact, extraordinary or cryptozoologic lifeforms; extraordinary human lifeforms endowed with magical powers such as witches, wizards, vampires, werewolves, zombies or other “living dead”; common superstitions regarding black cats, spilled salt, breaking mirrors, walking under ladders; astrology, palmistry, Tarot reading, *I Ching*, crystal gazing, other forms of divination, crystal healing, et cetera. Lindeman (Lindeman & Aarnio, 2007; Lindeman et al., 2008) proposed the following definition: “paranormal beliefs are beliefs in physical, biological, or psychological phenomena that contain core ontological attributes of one of the other two categories [e.g., a stone (physical) having thoughts (psychological)].” Many researches have adopted Broad’s (1953) conceptualization of paranormality as a phenomenon which violates the fundamental and scientifically founded principles of nature. However, scientific claims depend on an existing body of knowledge at any given moment in time or history (Kurtz, 1992; Bolton, Dearsley, Madronal-Luque, & Baron-Cohen, 2002), and it is not the case that every “non-scientific” idea would be considered as being paranormal, or even that most paranormal phenomena violate the most current physical theories.

PARANORMAL BELIEFS/EXPERIENCES AND SCHIZOTYPY

Belief in the paranormal is consistently associated with positive schizotypy (Farias, Claridge, & Lalljee, 2005; Gallagher, Kumar, & Pekala, 1994; Genovese, 2005; Goulding, 2004, 2005; Hergovich, Schott, & Arendsay, 2008; Hergovich, Willenger, & Arendsay, 2005; Houran, Irwin, & Lange, 2001; Peltzer, 2003; Thalbourne, 1994, 1999; Thalbourne et al., 1997; Thalbourne & Delin, 1994; Thalbourne, Dunbar, & Delin, 1995; Thalbourne & French, 1995; Tobacyk & Wilkinson, 1990; Williams, 1995; Williams & Irwin, 1991;

Wolfradt et al., 1999; Wolfradt & Watzke, 1999), a constellation of personality traits related to vulnerability to psychotic spectrum disorders. There are at least three dimensions of schizotypy: reality distortion or positive schizotypy, interpersonal deficits, and disorganization. The positive of reality distortion dimension, also referred to as the cognitive-perceptual dimension, consists of attenuated or subclinical positive symptoms of psychosis, that is, magical ideation (subclinical delusions) and unusual perceptual experiences (subclinical hallucinations). Schizotypy is also associated with paranormal experiences, such as out-of-body experiences and apparition experiences (McCreery & Claridge, 1995, 1996, 2002; Parra, 2006). Paranormal beliefs and anomalous experiences are included in the definition of the reality distortion or positive symptom dimension of schizotypy.

Like schizotypy, paranormal belief is a multifaceted construct. There are a number of different measures of paranormal belief, and factor analyses of these scales have reported two or more factors (e.g., Dagnall, Parker, & Munley, 2009; Smith & Karmin, 2002; Tobacyk & Milford, 1983). There is debate concerning the specific dimensional structure of paranormal belief and its measurement (e.g., Lawrence, 1995a, 1995b; Tobacyk, 1995a, 1995b), but there is evidence that the multiple dimensions of paranormal belief are intercorrelated; for example, for Tobacyk's Paranormal Beliefs Scale, the most widely used measure (oblique factors: Lawrence, 1995a; Lawrence & De Cicco, 1997; Lawrence, Roe, & Williams, 1997), and the total PBS has high internal reliability, indicating that there is a high level of intercorrelation among items. Top-down purification of items in Tobacyk's Revised Paranormal Beliefs Scale (Tobacyk, 1998) in order to remove items with differential item functioning related to subjects' age and gender yielded two clusters of items: New Age Philosophy, consisting of beliefs in psi, spiritualism, astrology, and reincarnation items; and Traditional Paranormal Belief, consisting of items referring to traditional religious beliefs, witchcraft, extraordinary lifeforms, and superstitions (Lange, Irwin & Houran, 2000). Houran, Irwin, and Lange (2001) found that the New Age Philosophy factor was significantly correlated with the Dissociative Experiences Scale and the Cognitive-Perceptual and Disorganized subscales of the SPQ-Brief, whereas the Traditional Paranormal Beliefs factor was significantly correlated only with the Cognitive-Perceptual subscale of the SPQ-B. New Age beliefs and practices comprise a loose form of religiosity including yoga, meditation, aromatherapy, astrology, Tarot, channeling, energy healing, and so forth, which have been found to be significantly associated with higher scores on the Magical Ideation and STA schizotypy scales (Farias, Claridge & Laljee, 2005). Structural equation modeling supported a model separating paranormal beliefs into two groups or latent factors: (1) Paranormal Beliefs (corresponding to the New Age Philosophy factor of Houran et al., 2001), consisting of RPBS subscales measuring beliefs in precognition, psi, spiritualism, and witchcraft; and (2) Superstition (corresponding to the Traditional Paranormal Belief factor

of Houran et al. 2001), consisting of RPBS subscales measuring beliefs in traditional religiosity, extraordinary lifeforms, and superstition, as well as items from the Magical Ideation Scale referring to superstition. A latent factor of schizotypy consisting of the three subscales of the SPQ-B (with the Cognitive-Perceptual dimension showing the strongest association) and Magical Ideation Scale items referring to ideas of reference was significantly related to both latent factors of Paranormal Belief and Superstition, but with a much stronger relationship to the Paranormal Belief latent factor, which mediated much of the effect of schizotypy on superstition. Thus, the cognitive-perceptual (reality distortion or positive) dimension of schizotypy is associated with paranormal belief generally, not just with one component of paranormal belief.

Scores on the Magical Ideation Scale were significantly correlated with total scores on Tobacyk's Paranormal Beliefs Scale, and with scores on five of the seven subscales: Superstition, Witchcraft, Extraordinary Lifeforms, Spiritualism, and Traditional Religious beliefs in a sample of high school students (Peltzer, 2003). The younger high school students scored higher than the university students on both Magical Ideation and the Paranormal Beliefs Scales. A cluster analysis based on subscales of the O-LIFE Cognitive Disorganization scale yielded three clusters: one with high scores on the Cognitive Disorganization and Introvertive Anhedonia subscales (CD/IA), another with high scores on the Unusual Experiences scale (UE), and a third with low scores on all three scales (LS; Goulding, 2004). The UE cluster scored significantly higher than the LS cluster on the Australian Sheep-Goat Scale, a measure of paranormal belief, whereas these clusters did not differ significantly on the Sense of Coherence Scale, a health-related measure. There was a significant correlation between the ASGS and the UE subscale of the O-LIFE in the total sample. These findings were interpreted as supporting a fully dimensional model of schizotypy with belief in the paranormal and unusual experiences considered as nonpathological manifestations of "healthy schizotypy." Goulding (2005) used the same methodology in a study of paranormal experients and believers, and found three schizotypy clusters, one with high scores on the Introvertive Anhedonia scale, one with high scores on the Disorganization scale, and one with low scores on both of these scales. The clusters did not differ significantly in paranormal beliefs measured by the ASGS, as all three groups had high scores (all were paranormal experients). The "low schizotypy" cluster (corresponding to the high Unusual Experiences cluster from the previous study) scored significantly higher than the other two clusters on the Sense of Coherence scale, suggesting that this cluster consisted of "healthy schizotypes." Genovese (2005) found that paranormal belief assessed by an eight-item scale was significantly correlated with scores on the Cognitive-Perceptual (i.e., Reality Distortion) and Disorganized dimensions of the SPQ-Brief in a sample of teachers and teacher trainees. Paranormal belief was also significantly correlated with an intuitive

thinking style as measured by the Rational-Experiential Inventory, although disorganized schizotypy was inversely correlated with an intuitive thinking style. Hergovich, Willenger, and Arendsay (2005) found that paranormal belief was significantly correlated with the cognitive-perceptual dimension of schizotypy. In a large Australian sample of adolescents, scores on the Revised Paranormal Beliefs Scale (RPBS) were significantly correlated with total scores on the SPQ-Brief, as well as scores on the Cognitive-Perceptual, Interpersonal, and Disorganized subscales of the SPQ-B, and the Magical Ideation Scale (Hergovich, Schott & Arendsay, 2008). The SPQ-B Cognitive-Perceptual dimension had a much stronger association with paranormal beliefs than the Interpersonal or Disorganized dimensions. Structural equation modeling supported a model separating paranormal beliefs into two groups or latent factors: (1) Paranormal Beliefs (corresponding to the New Age Philosophy factor of Houran et al., 2001), consisting of RPBS subscales measuring beliefs in precognition, psi, spiritualism, and witchcraft; and (2) Superstition (corresponding to the Traditional Paranormal Belief factor of Houran et al. 2001), consisting of RPBS subscales measuring beliefs in traditional religiosity, extraordinary lifeforms, and superstition, as well as items from the Magical Ideation Scale referring to superstition. A latent factor of schizotypy consisting of the three subscales of the SPQ-B (with the Cognitive-Perceptual dimension showing the strongest association) and Magical Ideation Scale items referring to ideas of reference was significantly related to both latent factors of Paranormal Belief and Superstition, but with a much stronger relationship to the Paranormal Belief latent factor, which mediated much of the effect of schizotypy on superstition.

The association between paranormal beliefs and experiences on the one hand and schizotypy on the other is often interpreted in terms of psychopathology, based on the assumption that schizotypy represents a subclinical form of schizophrenia spectrum psychopathology. Factor analyses of schizotypy measures have consistently yielded three factors paralleling the factor structure of schizophrenic symptomatology: (1) reality distortion or aberrant perceptions and beliefs (cognitive-perceptual or positive symptom dimension consisting of magical ideation, perceptual aberrations, ideas of reference, and suspiciousness), (2) cognitive disorganization (odd speech, odd behavior), and (3) negative symptoms or interpersonal deficit (no close friends, flattened affect, social anxiety) (e.g., Badcock & Dragovic, 2006; Chen, Hsiao, & Lin, 1997; Fossati et al., 2003; Gruzelier, 1994, 1995, 1996; Gruzelier et al., 1995; Raine et al., 1994; Reynolds et al., 2000; Rossi & Daneluzzo, 2002; Vollema & Hoijtink, 2000). McCreery and Claridge (2002) found four factors, with the negative symptoms factor described in other studies splitting into introverted anhedonia and asocial schizotypy factors. Subjects who reported at least one out-of-body experience scored significantly higher than non-OBErs on the aberrant perceptions and beliefs factor, but the groups did not differ significantly on the disorganization, introverted anhedonia, and asocial schizotypy factors. McCreery and

Claridge (1995, 1996) had previously reported that OBE experiencers scored higher than nonexperiencers on measures of positive schizotypy (Perceptual Aberration, Luanay-Slade Hallucination Scale, STA, Hypomania) and significantly lower on a measure of negative schizotypy (the Physical Anhedonia Scale), suggesting that, "far from being anhedonic, they were particularly enjoying life." It is possible that among "healthy schizotypes" unusual ideas may reflect creativity and unconventional thinking associated with high Openness to Experience, whereas among subjects with schizotypal personality disorder, the same sorts of unusual beliefs may be the result of cognitive rigidity and poor reality contact. They interpreted these findings as supporting the notion of "healthy schizotypes" who are functional despite, or even in part because of, their anomalous perceptual and other experiences. This interpretation is consistent with the fully dimensional model of schizotypy proposed by Claridge (1997, 1999; Claridge & Beech, 1995), which posits that schizotypy is a continuously distributed trait, associated with normal functioning for most of its extent, and playing a causal role in the etiology of psychosis only at the upper extreme. Thus, out-of-body experiences and other paranormal experiences are not necessarily pathological, and associations with schizotypy, particularly reality distortion or positive schizotypy, do not necessarily imply psychopathology.

The concept of healthy schizotypy suggests that paranormal beliefs and experiences may serve adaptive or protective functions in some individuals. It has been proposed that belief in the paranormal serves a psychodynamic coping function (Irwin, 1992, 2004). Lange and Houran (1997) found that participants with paranormal experiences had lower levels of death anxiety. Kennedy, Kanthamami, and Palmer (1994) found that paranormal experiences (not beliefs) were associated with an increased sense of meaning in life, and Kennedy and Kanthamami (1995a) reported a relationship between paranormal experiences and optimism and well-being. Wuthnow (1978) found that people who experienced "contact with the sacred" and "harmony with the universe" found life meaningful, knew the purpose of life, and were more self-assured than those who did not have these anomalous experiences. There is an association between religious experience, or belief in the influence of God or spiritual forces, and a sense of well-being (Hay & Morisy (1978). Greeley (1975) found an association between mystical experiences and life satisfaction. On average, people report that their peculiar beliefs had adaptive value, specifically that their beliefs were important to them, had a positive impact on their lives, and that they were more likely to make their lives more clear and less confusing (Boden & Berenbaum, 2004).

Schofield and Claridge (2007) suggested that possessing a framework of paranormal beliefs may result in paranormal experiences being adaptive and associated with less depression, anxiety, and anhedonia, whereas lack of a paranormal beliefs framework might render paranormal experiences frightening, intrusive, and disturbing. In subjects with low scores

on the O-LIFE Cognitive Disorganization scale, high scores on the Unusual Experiences scale were associated with more positive or pleasant subjective evaluations of paranormal experiences, whereas among subjects with high levels of cognitive disorganization, higher levels of introverted anhedonia were significantly associated with more negative subjective evaluations of paranormal experiences (Schofield & Claridge, 2007). These authors suggested that magical thinking provides an effective and imaginative framework to account for odd experiences, whereas in individuals with high levels of introverted anhedonia, such experiences may be seen as strange and overwhelming, and are associated with distress and anhedonia.

HYPNOTIZABILITY, PARANORMAL BELIEFS/EXPERIENCES, AND SCHIZOTYPY

Hypnotic susceptibility is associated with frequency of claimed paranormal experiences (Dixon, Labelle, & Laurence, 1996; Jamieson, 1987; Nadon & Kihlstrom, 1987; Pekala, Kumar, & Cummings, 1992; Richards, 1990; Wagner & Ratzeburg, 1987; Wickramasekara, 1988; Wilson & Barber, 1983), belief in paranormal or supernatural phenomena (Diamond & Taft, 1975; Hergovich, 2003; Irwin, 1993; Nadon, Laurence & Perry, 1987; Pekala, Kumar, & Cummings, 1992; Wagner & Ratzeburg, 1987), spiritual but not formal aspects of religious belief (Atkinson, 1989), a greater number of religious experiences (Argyle & Beit-Hallahmi, 1975; Gibbons & de Jarnette, 1972; Hood, 1973; Schumaker, 1995), and greater religious involvement for high than low hypnotizables (Hilgard, 1979). Hypnotic susceptibility has also been associated with ability to form vivid mental images or other fantasies (Priebe & Wallace, 1986; Sheehan, 1979, 1982), capacity to suspend normal reality testing during hypnosis (Bowers & Bowers, 1972; Gill & Brenman, 1959), and tendencies toward fantasy proneness (Lynn & Rhue, 1986; Rhue & Lynn, 1989), all of which seem to be involved in paranormal belief. Hypnotizability is significantly related to psychometric measures of schizotypy (Gruzelier et al., 2004; Jamieson & Gruzelier, 2001). Like schizotypy, hypnosis is thought to involve a priming of wider networks of association between cortical representational networks (Shames & Bowers, 1992). The Altered Experience subscale of the PCS (which includes items referring to alterations on body image, meaning, perception, and time sense) was significantly correlated with hypnotizability measured by the Harvard scale (Pekala & Nagler, 1989). High hypnotic susceptibility is also associated with increased susceptibility to visual illusions, such as autokinetic movement, the Ponzo illusion, the Necker Cube, and the Schroeder Staircase illusion (Crawford, Brown, & Moon, 1993; Nadon, Laurence, & Perry, 1987; Spanos et al., 1989; Wallace, 1986, 1988; Wallace, Garrett, & Anstadt, 1974; Wallace, Knight, & Garrett, 1976), which may provide experimental analogues to the magical ideation and perceptual aberrations of schizotypy. Physical anhedonia was negatively correlated with hypnotizability (McCloskey, Kumar, & Pekala, 1999), suggesting that it is

particularly “happy schizotypes,” that is, those low in anhedonia, who are highly hypnotizable. The disorganized component of schizotypy and high hypnotizability were both significantly related to low scores on the Self-Directedness scale of Cloninger’s Temperament and Character Inventory (Laidlaw et al., 2005). High self-transcendence was also associated with the cognitive activation (disorganization) dimension of schizotypy, higher absorption, and hypnotizability.

PARANORMAL BELIEFS, SCHIZOTYPY, AND CREATIVITY

Studies of other personality trait correlates of paranormal belief have reported that believers are likely to be slightly extraverted but balanced by a strong interest in their subjective experience, with high levels of creativity, imaginativeness, and hypnotic susceptibility (Irwin, 1993). Several studies have reported significant relationships between measures of schizotypic personality traits and measures of creativity in normal subjects (review by Brod, 1997). Creativity may be an adaptive aspect of positive schizotypy that contributes to selection of genetic factors contributing to this trait.

TRANSLIMINALITY

Transliminality is a hypothesized tendency for psychological material to cross thresholds into or out of consciousness. The concept of transliminality was suggested by the research of Thalbourne and Delin (1994), who found that believers/experiencers of the paranormal scored higher on measures of creative personality, mystical experiences, magical ideation, a history of manic-like experience, and a history of depressive experience. Principal components analysis confirmed the presence of a single factor underlying all six variables, which were all highly intercorrelated. Subsequent studies have confirmed these findings and broadened the construct of transliminality to include general religiosity, the cognitive-perceptual dimension of schizotypy, a propensity to experience altered states of consciousness, fantasy-proneness (a lifelong tendency to deep involvement in fantasy, including daydreaming), absorption (extremely focused or “total” attention), openness to experience (active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, and intellectual curiosity), extraversion, hyperaesthesia, synesthesia, frequency of dream-interpretation, sleep-related experiences (e.g., frequent dream recall, lucid dreams, hypnagogic/hypnopompic hallucinations, sleep paralysis), and temporal lobe lability (Houran, Thalbourne, & Lange, 2003; Jones, Fernyhough, & Meads, 2009; Kumar & Pekala, 1992; Kumar, Pekala, & Cummings, 1993; Lange, Thalbourne, Houran, & Storm, 2000; Pekala, Kumar, & Cummings, 1992; Soffer-Dudek & Shahar, 2009; Thalbourne, 1998, 2000a, 2000b, 2001; Thalbourne, Crawley,

& Houran, 2003; Thalbourne & Delin, 1999; Thalbourne & Houran, 2000; Thalbourne, Keogh, & Crawley, 1999; Thalbourne, Keogh, & Witt, 2005; Thalbourne & Maltby, 2008; Thalbourne et al., 1997, 2001, 2003; Watson, 2001, 2003). Studies cited above, as well as many others, report significant intercorrelations among the various components of transliminality. For example, there is a significant correlation between mystical experience and other paranormal experiences (Kennedy & Kanthamani, 1995a, 1995b; Kennedy, Kanthamani, & Palmer, 1994; Thalbourne, 1998–1999), both of which have high loadings on the transliminality factor.

Fantasy proneness, absorption, and openness to experience, all constituents of transliminality, are also correlates of hypnotizability, suggesting that hypnotizability is also a component of transliminality. A direct association between hypnotizability and transliminality has yet to be reported. Fantasy proneness is a personality trait involving a lifelong tendency to deep involvement in fantasy, including daydreaming, spending a large amount of time fantasizing, experiencing strong bodily concomitants of fantasies, and experiencing rich everyday fantasies of hallucinatory intensity, such as dolls and toys as alive and speaking to them, and having imaginary companions (Wilson & Barber, 1981, 1983). Fantasy proneness is associated with greater hypnotizability, creativity, waking suggestibility, and absorption (Council & Huff, 1990; Crawford, 1982; Kirsch & Council, 1992; Lynn & Dudley, 1987; Lynn & Rhue, 1986, 1988; Lynn, Rhue, & Green, 1988; Merckelbach, Horselenberg, & Muris, 2001; Merckelbach et al., 2000a; Persinger & DeSano, 1986; Poulsen & Matthews, 2003; Rauschenberg & Lynn, 1995; Rhue & Lynn, 1987a, 1987b, 1989; Silva, Bridges, & Metzger, 2005; Silva & Kirsch, 1992; Wilson & Barber, 1983). Fantasy proneness is associated with psychosis-proneness or positive schizotypy (Giesbrecht, Merckelbach, Kater, & Sluis, 2007; Kihlstrom, Glisky, & Anguilo, 1994; Klinger, Henning, & Janssen, 2009; Lynn & Dudley, 1987; Merckelbach, Horselenberg, & Muris, 2001; Merckelbach, Rassin, & Muris, 2000b; Van de Ven & Merckelbach, 2003). Hypnotizability is also significantly correlated with three of the six facets of Openness to Experience: fantasy, aesthetics, and feelings (Glisky et al., 1991). Of three orthogonal dimensions comprising Openness (absorption, intellectance, and liberalism), only absorption was significantly correlated with hypnotizability (Kihlstrom, Glisky, & Trapnell, 1992). Others have also reported that openness to experience was significantly correlated with paranormal belief (McCrae & Costa, 1997) and with paranormal experience (Zingrone, Alvarado, & Dalton, 1998–1999). The association between hypnotizability and schizotypy discussed previously also suggests that hypnotizability is a component of transliminality. The association between transliminality and mystical experiences, sleep-related experiences, and possibly hypnotizability suggests that transliminality is associated with a general susceptibility to altered states of consciousness. Individual differences in transliminality might be predictive of sensitivity

to the effects of minor and major hallucinogens, such as cannabis, mescaline, psilocybin, and LSD, and may be related to levels as well as circadian and ultradian rhythmicity of endogenous hallucinogens such as DMT. More extensive evidence supporting ritual healing theory may be marshaled by replacing hypnotizability with the superordinate trait of transliminality as the mediating factor.

There is an extensive body of literature linking transliminality and its constituent characteristics, including positive schizotypy, REM sleep-related experiences (dreams, hypnagogic hallucinations, sensed presence experiences), hypnotizability, and creativity to a characteristic preference for the mode of processing of the right hemisphere, that is, right "hemisphericity." Hemisphericity remains a controversial construct, but there is extensive and growing evidence of stable trait-like individual differences in hemispheric activation asymmetries, indicated by asymmetries in frontal EEG alpha, other EEG indices, evoked potentials (e.g., P300), cerebral blood flow, and metabolism, fMRI BOLD response, electrodermal activity, conjugate lateral eye movements, smooth pursuit eye movements, performance on lateralized cognitive tasks, dichotic listening, visual half-field studies of lateralized lexical decision, emotional face processing, and so forth, motoric asymmetries including performance on manual skill tasks, handedness and other dimensions of lateral preference, turning tendencies, asymmetric biases in the allocation of spatial attention measured by line-bisection, greyscales, cancellations, covert orienting of visual attention, and chimeric faces tasks, and even neuroanatomical asymmetries, all related to individual differences in personality, affective and cognitive style, particularly to transliminality and its constituent characteristics. There is also a large body of literature linking dissociation to many of the constituent characteristics of transliminality, including paranormal belief and experience, hypnotizability, fantasy-proneness, and schizotypy, as well as many studies linking these characteristics to a self-reported history of childhood trauma.

CONCLUSION

Ritual healing theory proposes that the evolution of beliefs in paranormal and spiritual phenomena was the result of selection for genes related to the trait of hypnotizability, as hypnotizable individuals were more likely to benefit from shamanic healing rituals. Hypnotizability is one component of a superordinate trait dimension, transliminality, which also includes positive schizotypy, paranormal beliefs, creativity, fantasy-proneness, absorption, and sleep-related anomalous experiences. A revision of ritual healing theory is proposed in which hypnotizability is replaced by the broader construct of transliminality as the critical mediating factor.

REFERENCES

- ARGYLE, M., & BEIT-HALLAHMI, B. (1975). *The social psychology of religion*. London: Routledge and Kegan Paul.
- ATKINSON, R. P. (1989, November). *Formal and spiritual aspects of religious involvement: Relationships to hypnotic responsiveness*. Paper presented at the meeting of the Society for Clinical and Experimental Hypnosis, St. Louis, MO.
- BABCOCK, W. L. (1895). On the morbid heredity and predisposition to insanity of the man of genius. *Journal of Nervous and Mental Disease*, **20**, 749–796.
- BADCOCK, J. C., & DRAGOVIC, M. (2006). Schizotypal personality in mature adults. *Personality and Individual Differences*, **40**, 77–85.
- BARON, M., RISCH, N., & MENDELWICZ, J. (1982). Differential fertility in bipolar affective illness. *Journal of Affective Disorders*, **4**, 103.
- BLACKMORE, S., & TROSCIANKO, T. (1985). Belief in the paranormal: Probability judgements, illusory control, and the “chance baseline shift.” *British Journal of Psychology*, **76**, 459–468.
- BODEN, M. T., & BERENBAUM, H. (2004). The potentially adaptive features of peculiar beliefs. *Personality and Individual Differences*, **37**, 707–719.
- BOLTON, D., DEARSLEY, P., MADRONAL-LUQUE, R., & BARON-COHEN, S. (2002). Magical thinking in childhood and adolescence: Development and relation to obsessive compulsion. *British Journal of Developmental Psychology*, **20**, 479–494.
- BOWERS, K. S., & BOWERS, P. G. (1972). Hypnosis and creativity: A theoretical and empirical rapprochement. In E. Fromm, & R. E. Shor (Eds.), *Hypnosis: Research developments and perspectives* (pp. 255–291). Chicago: Alsin-Atherton.
- BROAD, C. D. (1953). *Religion, philosophy, and psychical research*. New York: Harcourt & Brace.
- BROD, J. H. (1997). Creativity and schizotypy. In G. Claridge (Ed.), *Schizotypy: Implications for illness and health* (pp. 274–298). Oxford, UK: Oxford University Press.
- CHEN, W. J., HSIAO, C. K., & LIN, C. C. (1997). Schizotypy in community samples: The three-factor structure and correlation with sustained attention. *Journal of Abnormal Psychology*, **106**, 649–654.
- CLARIDGE, G. (1997). Theoretical background and issues. In G. Claridge (Ed.), *Schizotypy: Implications for illness and health* (pp. 3–18). Oxford: Oxford University Press.
- CLARIDGE, G. (1999). Esquizotipia: Teoría y medicina [Schizotypy: Theory and medicine]. *Revista Argentina de Clínica Psicológica*, **8**, 36–51.
- CLARIDGE, G., & BEECH, T. (1995). Fully and quasi-dimensional constructions of schizotypy. In A. Raine, T. Lencz, & S. A. Mednick (Eds.), *Schizotypal personality* (pp. 192–216). Cambridge, MA: Cambridge University Press.

- CLEMENTZ, B. A., GROVE, W. M., KATSANIS, J., & IACONO, W. G. (1991). Psychometric detection of schizotypy: Perceptual aberration and physical anhedonia in relatives of schizophrenics. *Journal of Abnormal Psychology*, **100**, 607–612.
- COUNCIL, J. R., & HUFF, K. D. (1990). Hypnosis, fantasy activity, and reports of paranormal experiences in high, medium and low fantasizers. *British Journal of Experimental and Clinical Hypnosis*, **7**, 9–15.
- CRAWFORD, H. J. (1982). Hypnotizability, daydreaming styles, imagery vividness, and absorption: A multidimensional study. *Journal of Personality and Social Psychology*, **42**, 915–926.
- CRAWFORD, H. J., BROWN, A., & MOON, C. (1993). Sustained attentional and disattentional abilities: Differences between low and high hypnotizable individuals. *Journal of Abnormal Psychology*, **102**, 534–543.
- DAGNALL, N., PARKER, A., & MUNLEY, G. (2009). Assessing superstitious belief. *Psychological Reports*, **104**, 447–454.
- DIAMOND, M. J., & TAFT, R. (1975). The role played by ego permissiveness and imagery in hypnotic responsivity. *International Journal of Clinical and Experimental Hypnosis*, **23**, 130–138.
- DIAZ-VILELA, L., & ALVAREZ-GONZALEZ, C. J. (2004). Differences in paranormal beliefs across fields of study from a Spanish adaptation of Tobacyk's RPBS (Revised Paranormal Belief Scale). *Journal of Parapsychology*, **68**, 405–421.
- DIXON, M., LABELLE, L., & LAURENCE, J. R. (1996). A multivariate approach to the prediction of hypnotic susceptibility. *International Journal of Clinical and Experimental Hypnosis*, **44**, 250–264.
- EDE, A. (2000). Has science education become an enemy of scientific rationality? *Skeptical Inquirer*, **24**(4), 48–51.
- ELIADE, M. (1974). *Shamanism: Archaic techniques of ecstasy* (trans. W. R. Trask). Princeton, NJ: Princeton University Press.
- EVE, R. A., & DUNN, D. (1990). Psychic powers, astrology and creationism in the classroom? *American Biology Teacher*, **52**, 10–21.
- FARIAS, M., CLARIDGE, G., & LALLJEE, M. (2005). Personality and cognitive predictors of New Age practices and beliefs. *Personality and Individual Differences*, **39**, 979–989.
- FOSSATI, A., RAINE, A., CARRETTA, I., LEONARDI, B., & MAFFEI, C. (2003). The three-factor model of schizotypal personality: Invariance across age and gender. *Personality and Individual Differences*, **35**, 1007–1019.
- FRANKE, P., MAIER, W., HARDT, J., & HAIN, C. (1993). Cognitive functioning and anhedonia in subjects at risk for schizophrenia. *Schizophrenia Research*, **10**, 77–84.
- GALLAGHER, C., KUMAR, V. K., & PEKALA, R. J. (1994). The anomalous experiences inventory: Reliability and validity. *Journal of Parapsychology*, **58**, 402–428.

- GALLUP, G. H., & NEWPORT, F. (1991). Belief in paranormal phenomena among adult Americans. *Skeptical Inquirer*, **15**(2), 137–146.
- GENOVESE, J. E. C. (2005). Paranormal beliefs, schizotypy, and thinking styles among teachers and future teachers. *Personality and Individual Differences*, **39**, 93–102.
- GIBBONS, D., & DE JARNETTE, J. (1972). Hypnotic susceptibility and religious experience. *Journal for the Scientific Study of Religion*, **11**, 152–156.
- GIESBRECHT, T., MERCKELBACH, H., KATER, M., & SLUIS, A. F. (2007). Why dissociation and schizotypy overlap: The joint influence of fantasy proneness, cognitive failures, and childhood trauma. *Journal of Nervous and Mental Disease*, **195**, 812–818.
- GILL, M. M., & BRENNAN, M. (1959). *Hypnosis and related states: Psychoanalytic studies in regression*. New York: International Universities Press.
- GLISKY, M. L., TATARYN, D. J., TOBIAS, B. A., KIHLLSTROM, J. F., & MCCONKEY, K. M. (1991). Absorption, openness to experience, and hypnotizability. *Journal of Personality and Social Psychology*, **60**, 263–272.
- GOULDING, A. (2004). Schizotypy models in relation to subjective health and paranormal beliefs and experiences. *Personality and Individual Differences*, **37**, 157–167.
- GOULDING, A. (2005). Healthy schizotypy in a population of paranormal believers and experiencers. *Personality and Individual Differences*, **38**, 1069–1083.
- GREELEY, A. (1975). *The sociology of the paranormal: A reconnaissance*. Beverly Hills, CA: Sage.
- GRUZELIER, J. H. (1994). Syndromes of schizophrenia and schizotypy, hemispheric imbalance and sex differences: Implications for developmental psychopathology. *International Journal of Psychophysiology*, **18**, 167–178.
- GRUZELIER, J. H. (1995). Syndromes of schizotypy: Patterns of cognitive asymmetry, arousal, and gender. In A. Raine, T. Lencz, & S. A. Mednick (Eds.), *Schizotypal personality* (pp. 329–351). Cambridge, UK: Cambridge University Press.
- GRUZELIER, J. H. (1996). The factorial structure of schizotypy: Part I. Affinities with syndromes of schizophrenia. *Schizophrenia Bulletin*, **22**, 611–620.
- GRUZELIER, J., BURGESS, A., STYGALL, J., IRVING, G., & RAINE, A. (1995). Patterns of cognitive asymmetry and syndromes of schizotypal personality. *Psychiatry Research*, **56**, 71–79.
- GRUZELIER, J. H., DE PASCALIS, V., JAMIESON, G., LAIDLAW, T., NAITO, A., BENNETT, B., & DWIVEDI, P. (2004). Relations between hypnotizability and psychopathology revisited. *Contemporary Hypnosis*, **21**, 169–175.
- HAY, D., & MORISY, A. (1978). Reports of ecstatic, paranormal, or religious experience in Great Britain and the United States: A comparison of trends. *Journal for the Scientific Study of Religion*, **17**, 255–268.

- HEARNE, K. (1984). A survey of reported premonitions and of those who have them. *Journal of the Society of Psychical Research*, **52**, 261–270.
- HERGOVICH, A. (2003). Field dependence, suggestibility, and belief in paranormal phenomena. *Personality and Individual Differences*, **34**, 195–209.
- HERGOVICH, A., SCHOTT, R., & ARENDASAY, M. (2008). On the relationship between paranormal belief and schizotypy among adolescents. *Personality and Individual Differences*, **45**, 119–125.
- HERGOVICH, A., WILLINGER, U., & ARENDASY, M. (2005). Paranormal belief, schizotypy, and Body Mass Index. *Perceptual and Motor Skills*, **100**, 883–891.
- HILGARD, J. R. (1979). *Personality and hypnosis: A study of imaginative involvement* (2nd ed.). Chicago: University of Chicago Press.
- HOOD, R. W., JR. (1973). Hypnotic susceptibility and reported religious experience. *Psychological Reports*, **33**, 549–550.
- HOURLAN, J., IRWIN, H. J., & LANGE, R. (2001). Clinical relevance of the two-factor Rasch version of the Revised Paranormal Belief Scale. *Personality and Individual Differences*, **31**, 371–382.
- HOURLAN, J., THALBOURNE, M. A., & LANGE, R. (2003). Methodological note: Erratum and comment on the use of the Revised Transliminality Scale. *Consciousness and Cognition*, **12**, 140–144.
- IRWIN, H. J. (1992). Origins and functions of paranormal belief: The role of childhood trauma and interpersonal control. *Journal of the American Society for Psychical Research*, **86**, 199–208.
- IRWIN, H. J. (1993). Belief in the paranormal: A review of the empirical literature. *Journal of the American Society for Psychical Research*, **87**, 1–39.
- IRWIN, H. J. (2004). *An introduction to parapsychology* (4th ed.). Jefferson, NC: McFarland.
- JAMIESON, G. A. (1987). *The structure and meaning of absorption*. Unpublished MSc dissertation. University of Queensland, Australia.
- JAMIESON, G. A., & GRUZELIER, J. H. (2001). Hypnotic susceptibility is positively related to a subset of schizotypy items. *Contemporary Hypnosis*, **18**, 32–37.
- JONES, S. R., FERNYHOUGH, C., & MEADS, C. (2009). In a dark time: Development, validation, and correlates of the Durham hypnagogic and hypnopompic hallucinations questionnaire. *Personality and Individual Differences*, **46**, 30–34.
- JONES, W. H., RUSSEL, D. W., & NICKEL, T. W. (1977). Belief in the Paranormal Scale: An objective instrument to measure belief in magical phenomena and causes. *Journal Supplement Abstract Service, Catalog of Selected Documents in Psychology*, **7**, 100 (MS 1577).
- KALLERY, M. (2001). Early-years educators' attitudes to science and pseudo-science: The case of astronomy and astrology. *European Journal of Teacher Education*, **24**, 329–342.

- KENNEDY, J. E., & KANTHAMAMI, H. (1995a). An exploratory study of the effects of paranormal and spiritual experience on peoples' lives and well-being. *Journal of the American Society for Psychical Research*, **89**, 249–264.
- KENNEDY, J. E., & KANTHAMAMI, H. (1995b). Association between anomalous experiences and artistic creativity and spirituality. *Journal of the American Society for Psychical Research*, **89**, 333–341.
- KENNEDY, J. E., KANTHAMAMI, H., & PALMER, J. (1994). Psychic and spiritual experiences, health, well-being, and meaning in life. *Journal of Parapsychology*, **58**, 353–383.
- KIHLSTROM, J. F., GLISKY, M. L., & ANGIULO, M. J. (1994). Dissociative tendencies and dissociative disorders. *Journal of Abnormal Psychology*, **103**, 117–124.
- KIHLSTROM, J. F., GLISKY, M. L., & TRAPNELL, P. (1992). *Will the real fifth factor please stand up? The "big five" structure of personality in language and behavior*. Unpublished manuscript, University of Arizona.
- KIRSCH, I., & COUNCIL, J. R. (1992). Situational and personality correlates of suggestibility. In E. Fromm, & M. Nash (Eds.), *Contemporary hypnosis research* (pp. 267–291). New York: Guilford Press.
- KLINGER, E., HENNING, V. K., & JANSSEN, J. M. (2009). Fantasy proneness dimensionalized: Dissociative component is related to psychopathology, daydreaming as such is not. *Journal of Research in Personality*, **43**, 506–510.
- KUMAR, V. K., & PEKALA, R. J. (1992). *The Mental Experience Inventory*. Unpublished psychological test. West Chester, PA: West Chester University.
- KUMAR, V. K., PEKALA, R. J., & CUMMINGS, J. (1993). Sensation seeking, drug use and reported paranormal beliefs and experiences. *Personality and Individual Differences*, **14**, 685–691.
- KURTZ, P. (1992). *The new skepticism*. New York: Prometheus Books.
- LAIDLAW, T. M., DWIVEDI, P., NAITO, A., & GRUZELIER, J. H. (2005). Low self-directedness (TCI), mood, schizotypy and hypnotic susceptibility. *Personality and Individual Differences*, **39**, 469–480.
- LANGE, R., & HOURAN, J. (1997). Death anxiety and the paranormal: The primacy of belief over experience. *Journal of Nervous and Mental Disease*, **185**, 584–586.
- LANGE, R., IRWIN, H. J., & HOURAN, J. (2000). Top-down purification of Tobacyk's Revised Paranormal Belief Scale. *Personality and Individual Differences*, **29**, 131–156.
- LANGE, R., THALBOURNE, M. A., HOURAN, J., & STORM, L. (2000). The Revised Transliminality Scale: Reliability and validity data from a Rasch top-down purification procedure. *Consciousness and Cognition*, **9**, 591–617.
- LAWRENCE, T. R. (1995a). How many factors of paranormal belief are there? A critique of the PBS. *Journal of Parapsychology*, **59**, 3–25.

- LAWRENCE, T. R. (1995b). Moving on from the PBS: A final reply to Tobacyk. *Journal of Parapsychology*, **59**, 131–140.
- LAWRENCE, T. R., & DE CICCO, P. (1997). The factor structure of the Paranormal Belief Scale: More evidence in support of the oblique five. *Journal of Parapsychology*, **61**, 244–251.
- LAWRENCE, T. R., ROE, C. A., & WILLIAMS, C. (1997). Confirming the factor structure of the Paranormal Beliefs Scale: Big orthogonal seven or oblique five? *Journal of Parapsychology*, **61**, 13–31.
- LINDEMAN, M., & AARNIO, K. (2007). Superstitious, magical, and paranormal beliefs: An integrative model. *Journal of Research in Personality*, **41**, 731–744.
- LINDEMAN, M., CEDERSTROM, S., SIMOLA, P., SIMULA, A., OLLIKAINEN, S., & RIEKKE, T. (2008). Sentences with core knowledge violations increase the size of N400 among paranormal believers. *Cortex*, **44**, 1307–1315.
- LYNN, S. J., & DUDLEY, K. (1987). *The Magical Ideation Scale: A construct validation study*. Unpublished manuscript, Ohio University, Athens.
- LYNN, S. J., & RHUE, J. W. (1986). The fantasy-prone person: Hypnosis, imagination, and creativity. *Journal of Personality and Social Psychology*, **51**, 404–408.
- LYNN, S. J., & RHUE, J. W. (1988). Fantasy proneness: Hypnosis, developmental antecedents, and psychopathology. *American Psychologist*, **43**, 35–44.
- LYNN, S. J., RHUE, J. W., & GREEN, J. P. (1988). Multiple personality and fantasy proneness: Is there an association or dissociation? *British Journal of Experimental and Clinical Hypnosis*, **5**, 138–142.
- MCCLENON, J. (1997). Shamanic healing, human evolution, and the origin of religion. *Journal for the Scientific Study of Religion*, **36**, 345–354.
- MCCLOSKEY, M. S., KUMAR, V. K., & PEKALA, R. J. (1999). State and trait depression, physical and social anhedonia, hypnotizability and subjective experiences during hypnosis. *American Journal of Clinical Hypnosis*, **41**, 231–252.
- MCCRAE, R. R., & COSTA, P. T., JR. (1997). Conceptions and correlates of openness to experience. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 825–847). San Diego, CA: Academic Press.
- MCCREERY, C., & CLARIDGE, G. (1995). Out-of-the-body experiences and personality. *Journal of the Society for Psychical Research*, **60**, 129–148.
- MCCREERY, C., & CLARIDGE, G. (1996). A study of hallucination in normal subjects I. Self-report data. *Personality and Individual Differences*, **21**, 739–747.
- MCCREERY, C., & CLARIDGE, G. (2002). Healthy schizotypy: The case of out-of-body experiences. *Personality and Individual Differences*, **32**, 141–154.

- MERCKELBACH, H., HORSELENBERG, R., & MURIS, P. (2001). The Creative Experiences Questionnaire (CEQ): A brief self-report measure of fantasy proneness. *Personality and Individual Differences*, **31**, 987–995.
- MERCKELBACH, H., HORSELENBERG, R., WESSEL, I., RASSIN, E., & VERHOEVEN, C. (2000a). Beroemd of toch niet: Persoonlijkheidsverschillen en het false fame effect [Famous or not: Individual differences and the false fame effect]. *Nederlands Tijdschrift Voor De Psychologie*, **54**, 235–240.
- MERCKELBACH, H., RASSIN, E., & MURIS, P. (2000b). Dissociation, schizotypy, and fantasy proneness in undergraduate students. *Journal of Nervous and Mental Disease*, **188**, 428–431.
- MUSELLA, D. P. (2005). Gallup poll shows that Americans' belief in the paranormal persists. *Skeptical Inquirer*, **29**(5), 5.
- NADON, R., & KIHLSSTROM, J. F. (1987). Hypnosis, psi, and the psychology of anomalous experience. *Behavioral and Brain Sciences*, **10**, 597–599.
- NADON, R., LAURENCE, J. R., & PERRY, C. (1987). Multiple predictors of hypnotic susceptibility. *Journal of Personality and Social Psychology*, **53**, 948–960.
- NEWPORT, F., & STRAUSBERG, M. (2001, June 8). Americans' belief in psychic and paranormal phenomena is up over last decade. *Gallup News Service*. Retrieved from www.gallup.com/poll/releases/pr010608.asp.
- ORENSTEIN, A. (2002). Religion and paranormal belief. *Journal for the Scientific Study of Religion*, **41**, 301–311.
- PARRA, A. (2006). "Seeing and feeling ghosts": Absorption, fantasy proneness, and healthy schizotypy as predictors of crisis apparition experiences. *Journal of Parapsychology*, **70**, 357–372.
- PEKALA, R. J., KUMAR, V. K., & CUMMINGS, J. (1992). Types of high hypnotically-susceptible individuals and reported attitudes and experiences of the paranormal and the anomalous. *Journal of the American Society for Psychical Research*, **86**, 135–150.
- PEKALA, R. J., & NAGLER, R. (1989). The assessment of hypnoidal states: Rationale and clinical application. *American Journal of Clinical Hypnosis*, **31**, 231–236.
- PELTZER, K. (2003). Magical thinking and paranormal beliefs among secondary and university students in South Africa. *Personality and Individual Differences*, **35**, 1419–1426.
- PERSINGER, M. A., & DESANO, C. F. (1986). Temporal lobe signs: Positive correlations with imaginings and hypnosis induction profiles. *Psychological Reports*, **58**, 347–350.
- POULSEN, B. C., & MATTHEWS, W. J., JR. (2003). Correlates of imaginative and hypnotic suggestibility in children. *Contemporary Hypnosis*, **20**, 198–208.
- PRIEBE, F. A., & WALLACE, B. (1986). Hypnotic susceptibility, imaging ability, and the detection of embedded objects. *International Journal of Clinical and Experimental Hypnosis*, **34**, 320–329.

- RAINE, A., REYNOLDS, C., LENCZ, T., SCERBO, A., TRIPHON, N., & KIM, D. (1994). Cognitive-perceptual, interpersonal, and disorganized features of schizotypal personality. *Schizophrenia Bulletin*, **26**, 603–618.
- RATTET, S. L., & BURSIK, K. (2001). Investigating the personality correlates of paranormal belief and precognitive experience. *Personality and Individual Differences*, **31**, 433–444.
- RAUSCHENBERG, S. L., & LYNN, S. J. (1995). Fantasy proneness, DSM-III-R Axis I psychopathology, and dissociation. *Journal of Abnormal Psychology*, **104**, 373–380.
- REYNOLDS, C. A., RAINE, A., MELLINGEN, K., VENABLES, P. H., & MEDNICK, S. A. (2000). Three-factor model of schizotypal personality: Invariance across culture, gender, religious affiliation, family adversity, and psychopathology. *Schizophrenia Bulletin*, **26**, 603–618.
- RHUE, J. W., & LYNN, S. J. (1987a). Fantasy proneness: Developmental antecedents. *Journal of Personality*, **55**, 121–137.
- RHUE, J. W., & LYNN, S. J. (1987b). Fantasy proneness and psychopathology. *Journal of Personality and Social Psychology*, **53**, 327–336.
- RHUE, J. W., & LYNN, S. J. (1989). Fantasy proneness, hypnotizability, and absorption—re-examination: A brief communication. *International Journal of Clinical and Experimental Hypnosis*, **37**, 100–106.
- RICE, T. W. (2003). Believe it or not: Religious and other paranormal beliefs in the United States. *Journal for the Scientific Study of Religion*, **42**, 95–106.
- RICHARDS, D. G. (1990). Hypnotic susceptibility and subjective psychic experiences. *Journal of Parapsychology*, **54**, 35–51.
- ROSSI, A., & DANELUZZO, E. (2002). Schizotypal dimensions in normals and schizophrenic patients: A comparison with other clinical samples. *Schizophrenia Research*, **54**, 67–75.
- RYBACK, D., & SWITZER, L. (1989). *Dreams that come true*. New York: Doubleday.
- SCHOFIELD, K., & CLARIDGE, G. (2007). Paranormal experiences and mental health: Schizotypy as an underlying factor. *Personality and Individual Differences*, **43**, 1908–1916.
- SCHUMAKER, J. F. (1995). *The corruption of reality: A unified theory of religion, hypnosis, and psychopathology*. Amherst, NY: Prometheus Books.
- SHAMES, V. A., & BOWERS, P. G. (1992). Hypnosis and creativity. In E. Fromm, & M. R. Nash (Eds.), *Contemporary hypnosis research* (pp. 334–363). New York: Guilford.
- SHEEHAN, P. W. (1979). Hypnosis and the process of imagination. In E. Fromm, & R. E. Shor (Eds.), *Hypnosis: Developments in research and new perspectives* (2nd ed., pp. 381–411). New York: Aldine.
- SHEEHAN, P. W. (1982). Imagery and hypnosis: Forging a link, at least in part. *Psychiatry and Behavior*, **7**, 257–272.

- SILVA, C., BRIDGES, K. R., & METZGER, M. (2005). Personality, expectancy, and hypnotizability. *Personality and Individual Differences*, **39**, 131–142.
- SILVA, C. E., & KIRSCH, I. (1992). Interpretive sets, expectancy, fantasy proneness, and dissociation as predictors of hypnotic response. *Journal of Personality and Social Psychology*, **63**, 847–856.
- SILVERMAN, J. M., SIEVER, L. J., MOHS, R. C., PINKHAM, L., & DAVIS, K. L. (1991). Schizotypal personality disorder traits without comorbid affective PD symptoms may better identify a schizophrenia related phenotype. *Biological Psychiatry*, **29**, 105a.
- SMITH, J. C., & KARMIN, A. D. (2002). Idiosyncratic reality claims, relaxation dispositions, and ABC relaxation theory: Happiness, literal Christianity, miraculous powers, metaphysics, and the paranormal. *Psychological Reports*, **95**, 1119–1128.
- SOFFER-DUDEK, N., & SHAHAR, G. (2009). What are sleep-related experiences? Associations with transliminality, psychological distress, and life stress. *Consciousness and Cognition*, **18**, 891–904.
- SPANOS, N. P., DEON, J. L., PAWLAK, A. E., MAH, C. D., & RITCHIE, G. (1989). A multivariate study of hypnotic susceptibility. *Imagination, Cognition and Personality*, **9**, 33–48.
- STEVENS, B. (1969). *Marriage and fertility of women suffering from schizophrenia and affective disorders*. Maudsley Monograph No. 19. London: Oxford University Press.
- THALBOURNE, M. A. (1994). Belief in the paranormal and its relationship to schizophrenia-relevant measures: A confirmatory study. *British Journal of Clinical Psychology*, **33**, 78–80.
- THALBOURNE, M. A. (1998). Transliminality: Further correlates and a short measure. *Journal of the American Society for Psychical Research*, **92**, 402–419.
- THALBOURNE, M. A. (1998–1999). The sheep-goat variable and mystical experience: Their relationship and levels in a special population. *European Journal of Parapsychology*, **14**, 80–88.
- THALBOURNE, M. A. (1999). Personality characteristics of students who believe themselves to be psychic. *Journal of the Society for Psychical Research*, **63**, 203–212.
- THALBOURNE, M. A. (2000a). Relation between transliminality and openness to experience. *Psychological Reports*, **86**, 909–910.
- THALBOURNE, M. A. (2000b). Transliminality: A review. *International Journal of Parapsychology*, **11**, 1–34.
- THALBOURNE, M. A. (2001). Measures of the sheep-goat variable, transliminality, and their correlates. *Psychological Reports*, **88**, 339–350.
- THALBOURNE, M. A., BARTEMUCCI, L., DELIN, P. S., FOX, B., & NOFI, O. (1997). Transliminality: Its nature and correlates. *Journal of the American Society for Psychical Research*, **91**, 305–331.

- THALBOURNE, M. A., CRAWLEY, S. E., & HOURAN, J. (2003). Temporal lobe lability in the highly transliminal mind. *Personality and Individual Differences*, **35**, 1965–1974.
- THALBOURNE, M. A., & DELIN, P. S. (1994). A common thread underlying belief in the paranormal, creative personality, mystical experience, and psychopathology. *Journal of Parapsychology*, **58**, 3–38.
- THALBOURNE, M. A. (1999). Transliminality: Its relation to dream-life, religiosity, and mystical experience. *International Journal for the Psychology of Religion*, **9**, 45–61.
- THALBOURNE, M. A., DUNBAR, K. A., & DELIN, P. (1995). An investigation into correlates of belief in the paranormal. *Journal of the American Society for Psychical Research*, **89**, 215–231.
- THALBOURNE, M. A., & FRENCH, C. C. (1995). Paranormal belief, manic-depressiveness, and magical ideation: A replication. *Personality and Individual Differences*, **18**, 291–292.
- THALBOURNE, M. A., & HOURAN, J. (2000). Transliminality, the Mental Experience Inventory, and tolerance of ambiguity. *Personality and Individual Differences*, **28**, 853–863.
- THALBOURNE, M. A., HOURAN, J., ALIAS, A. G., & BRUGGER, P. (2001). Transliminality, brain function, and synesthesia. *Journal of Nervous and Mental Disease*, **189**, 190–192.
- THALBOURNE, M. A., KEOGH, E., & CRAWLEY, S. E. (1999). Manic-depressiveness and its correlates. *Psychological Reports*, **85**, 45–53.
- THALBOURNE, M. A., KEOGH, E., & WITT, G. (2005). Transliminality and the Oxford-Liverpool inventory of feelings and experiences. *Psychological Reports*, **96**, 579–585.
- THALBOURNE, M. A., & MALTBY, J. (2008). Transliminality, thin boundaries, unusual experiences, and temporal lobe lability. *Personality and Individual Differences*, **44**, 1617–1623.
- TOBACYK, J. (1995a). What is the correct dimensionality of paranormal beliefs? A reply to Lawrence's critique of the Paranormal Beliefs Scale. *Journal of Parapsychology*, **59**, 27–46.
- TOBACYK, J. (1995b). Final thoughts on issues in the measurement of paranormal beliefs. *Journal of Parapsychology*, **59**, 141–145.
- TOBACYK, J. (1998). *A Revised Paranormal Belief Scale*. Unpublished manuscript, Louisiana Tech University, Ruston, LA.
- TOBACYK, J., & MILFORD, G. (1983). Belief in paranormal phenomena: Assessment instrument development and implications for personality functioning. *Journal of Personality and Social Psychology*, **44**, 1029–1037.
- TOBACYK, J., & WILKINSON, L. (1990). Magical thinking and paranormal beliefs. *Journal of Social Behavior and Personality*, **5**, 255–264.
- VAN DE VEN, V., & MERCKELBACH, H. (2003). The role of schizotypy, mental imagery, and fantasy proneness in hallucinatory reports

- of undergraduate students. *Personality and Individual Differences*, **35**, 889–896.
- VOLLEMA, M. G., & HOIJTINK, H. (2000). The multidimensionality of self-report schizotypy in a psychiatric population: An analysis using multidimensional Rasch models. *Schizophrenia Bulletin*, **26**, 565–575.
- VYSE, S. A. (1997). *Believing in magic: The psychology of superstition*. New York: Oxford University Press.
- WAGNER, M. W., & RATZEBURG, F. H. (1987). Hypnotic suggestibility and paranormal belief. *Psychological Reports*, **60**, 1069–1070.
- WALLACE, B. (1986). Latency and frequency reports to the Necker Cube illusion: Effects of hypnotic susceptibility and mental arithmetic. *Journal of General Psychology*, **113**, 187–194.
- WALLACE, B. (1988). Hypnotic susceptibility, visual distraction, and reports of Necker Cube apparent reversals. *Journal of General Psychology*, **115**, 389–396.
- WALLACE, B., GARRETT, J. B., & ANSTADT, S. P. (1974). Hypnotic susceptibility, suggestion, and reports of autokinetic movement. *American Journal of Psychology*, **87**, 117–123.
- WALLACE, B., KNIGHT, T. A., & GARRETT, J. B. (1976). Hypnotic susceptibility and frequency reports to illusory stimuli. *Journal of Abnormal Psychology*, **85**, 558–563.
- WATSON, D. (2001). Dissociations of the night: Individual differences in sleep-related experiences and their relation to dissociation and schizotypy. *Journal of Abnormal Psychology*, **110**, 526–535.
- WATSON, D. (2003). To dream, perchance to remember. Individual differences in dream recall. *Personality and Individual Differences*, **34**, 1271–1286.
- WEISER, M., REICHENBERG, A., WERBELOFF, N., HALPERIN, D., KRAVITZ, E., YOFFE, R., & DAVIDSON, M. (2009). Increased number of offspring in the first-degree relatives of psychotic individuals: A partial explanation for the persistence of psychotic illness. *Acta Psychiatrica Scandinavica*, **119**, 466–471.
- WEST, D. (1995). Note on a recent psychic survey. *Journal of the Society for Psychical Research*, **60**, 168–171.
- WICKRAMASEKARA, I. E. (1988). *Clinical behavior medicine: Some concepts and procedures*. New York: Plenum.
- WILLIAMS, L. (1995). Belief in the paranormal: Its relationship with schizotypy and cognitive style. *Australian Parapsychological Review*, **20**, 8–10.
- WILLIAMS, L. M., & IRWIN, H. J. (1991). A study of paranormal belief, magical ideation as an index of schizotypy, and cognitive style. *Personality and Individual Differences*, **12**, 1339–1348.
- WILSON, S. C., & BARBER, T. X. (1981). Vivid fantasy and hallucinatory abilities in the life histories of excellent hypnotic subjects

- ("somnambules"): Preliminary report with female subjects. In E. Klinger (Ed.), *Imagery: Vol. 2. Concepts, results, and applications* (pp. 133–149). New York: Plenum Press.
- WILSON, S. C., & BARBER, T. X. (1983). The fantasy-prone personality: Implications for understanding imagery, hypnosis, and parapsychological phenomena. In A. A. Sheikh (Ed.), *Imagery: Current theory, research, and application* (pp. 349–390). New York: Wiley.
- WOLFRADT, U., OUBAID, V., STRAUBE, E. R., BISCHOFF, N., & MISCHO, J. (1999). Thinking styles, schizotypal traits, and anomalous experience. *Personality and Individual Differences*, **27**, 821–830.
- WOLFRADT, U., & WATZKE, S. (1999). Deliberate out-of-body experiences, depersonalization, schizotypal traits, and thinking styles. *Journal of the American Society for Psychical Research*, **93**, 249–257.
- YATES, C. R., & CHANDLER, M. (2000). Where have all the skeptics gone? Patterns of new age beliefs and anti-scientific attitudes in preservice primary teachers. *Research in Science Education*, **30**, 377–387.
- YSSELDYK, R., MATHESON, K., & ANISHMAN, H. (2010). Religiosity as identity: Toward an understanding of religion from a social identity perspective. *Personality and Social Psychology Review*, **14**, 60–71.
- ZINGRONE, N. L., ALVARADO, C. S., & DALTON, K. (1998–1999). Psi experiences and the "Big Five": Relating the NEO-PI-R to the experiential claims of experimental subjects. *European Journal of Parapsychology*, **14**, 31–51.
- ZUSNE, L., & JONES, W. H. (1989). *Anomalistic psychology: A study of magical thinking*. Hillsdale, NJ: Lawrence Erlbaum.

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ABSTRACTS IN OTHER LANGUAGES

German

DIE EVOLUTION DES GLAUBENS AN GOTT, GEIST UND DAS PARANORMALE, II: TRANSLIMINALITÄT ALS DER VERMITTELNDE FAKTOR

ZUSAMMENFASSUNG: Die Theorie der rituellen Heilung geht davon aus, daß die Evolution von Glaubensvorstellungen an paranormale und spirituelle Phänomene das Ergebnis einer genetischen Selektion in Bezug auf das Merkmal Hypnotisierbarkeit darstellt, da hypnotisierbare Personen mit größerer Wahrscheinlichkeit von schamanistischen Heilungsritualen profitieren. Hypnotisierbarkeit ist eine Komponente des übergeordneten Persönlichkeitsmerkmals Transliminalität, das auch positive Schizotypie,

paranormale Einstellungen, Kreativität, Phantasieneigung, Absorption und mit dem Schlafzustand auftretende anomale Erfahrungen umfaßt. Fragebogenwerte dieser Eigenschaften sind untereinander hochkorreliert, und Faktorenanalysen ergeben eine einzige zugrundeliegende Dimension. Eine revidierte Fassung der Theorie der rituellen Heilung wird vorgestellt, bei der Hypnotisierbarkeit durch das umfassendere Konstrukt Transliminalität als dem entscheidenden vermittelnden Faktor ersetzt wird.

French

L'EVOLUTION DES CROYANCES EN DIEU, L'ESPRIT,
ET LE PARANORMAL, II: LA TRANSLIMINALITE
COMME FACTEUR MODERATEUR PREMIER

RESUME : La théorie de la guérison rituelle propose que l'évolution des croyances dans les phénomènes paranormaux et spirituels fut le résultat de la sélection de gènes liés au trait d'hypnotisabilité, car les individus hypnotisables étaient plus enclins à bénéficier des rituels de guérison chamannique. L'hypnotisabilité est une composante d'une dimension de la personnalité d'ordre supérieur, la transliminalité, qui inclut aussi la schizotypie positive, les croyances paranormales, la créativité, l'enclin à l'imaginaire, l'absorption, et les expériences anormales relatives au sommeil. Les mesures de chacun de ces traits sont fortement corrélées entre elles, et l'analyse factorielle révèle une unique dimension sous-jacente. Une révision de la théorie de la guérison rituelle est proposée dans laquelle l'hypnotisabilité est remplacée par la notion plus large de transliminalité en tant que facteur modérateur premier.

Spanish

LA EVOLUCIÓN DE CREENCIAS EN DIOS, EL ESPÍRITU Y LO PARANORMAL,
II. TRANSLIMINALIDAD COMO UN FACTOR MEDIADOR

RESUMEN: La teoría ritual de la curación propone que la evolución de creencias en lo paranormal y en fenómenos espirituales ha sido el resultado de la selección de genes relacionados a el rasgo de hipnotizabilidad, pues individuos hipnotizables se benefician más de los rituales de curación chamánicos. La hipnotizabilidad es un componente de una dimensión de rasgos superordinados, la transliminalidad, la cual también incluye esquizotipia positiva, creencias paranormales, creatividad, propensidad a la fantasía, absorción, y experiencias anómalas relacionadas a el sueño. Las medidas de cada uno de estos rasgos están altamente correlacionadas con cada una de las otras, y los análisis de factores muestran una sola dimensión de trasfondo. Se propone una revisión de la teoría ritual de curación en la cual la hipnotizabilidad es reemplazada por el más amplio concepto de transliminalidad como el factor crítico mediador.