

Of Unequal Temperament: What Neuroscience Suggests about Pastoral Care with Artists¹

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Abstract Whether they are church staff musicians, other creative congregants, or fall into the increasing “spiritual but not religious” category, pastoral caregivers frequently encounter the dual joy and challenge of working with **artists**. I argue that just as we encounter unexpectedly rich musical nuances when we expand beyond the modern standard of tuning keyboard instruments to “equal temperament,” we open ourselves to gifts of spiritual sensitivity, intuitive depth, and transcendent experience when we seek to understand the artistic temperament and use this understanding to inform our pastoral care. To do so I draw upon the work of the late Australian psychologist Michael A. Thalbourne, whose concept of **transliminality** has opened new vistas of research examining the neuropsychology of highly creative people. Because transliminal artists’ brains and personalities have certain characteristics, they require pastoral therapists and spiritual directors who 1) take unusual experiences seriously and can connect them with resources in their faith tradition; 2) encourage contemplative spiritual practices, but with certain precautions; 3) can help balance esoteric perceptions with grounding in the body, nature, and community; 4) recognize that “New Age” or complementary/alternative medical (CAM) practices encompass a broad territory and take care to distinguish between wheat and chaff; and who 5) dare, following the example of Jesus, to use suggestibility and altered states in God’s service.

Keywords transliminality, Michael Thalbourne, artists, temperament, creative

¹ This article is dedicated to English novelist and theologian Susan Howatch, whose historic-fictional Starbridge series has profoundly influenced my perspective on Christianity and transliminality.

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“*Unequal temperament* (Mus.), that in which the variations are thrown into the keys least used. [1913 Webster]”

A portrait of the artist as a young man

Jacob³ is a concert-level guitarist in his early twenties whose work is in high demand throughout his mid-size Southern city. While not a regular churchgoer, he often plays for worship services and has gotten to know members of choirs and praise bands, which is how you two met. Now he is describing a recording session held in a local church sanctuary last night.

Usually focused and professional, Jacob had trouble keeping his attention on his part; he was distracted by a feeling of “something spiritually wrong” going on in the room. Fortunately, the producer was patient with him, but Jacob was not able to perform well until he relocated from his original position near the front altar to the lower ground level of the sanctuary, near the pews, which altered the acoustics. He looks at you with wide yet distant eyes, visibly still spooked. “I can’t tell if there was something sinister going on at that church, or if God’s trying to get my attention!”

You find yourself wondering about the possible onset of mental illness, but don’t want to scare him, and you do have knowledge of some notable dysfunction among the staff members of that particular congregation. Could Jacob be exhibiting acute spiritual or psychological sensitivity? Is he just imagining things? Does the physical location of his malaise hold any significance? You’ve also been hoping Jacob would find a faith community he feels at home in—easier said than done for a Christian musician whom you suspect is probably gay but not “out.” Could God indeed be trying to get Jacob’s attention somehow through this episode, or is

³ Not an actual person, but rather a composite of individuals and episodes I have encountered as a musician and therapist.

Jacob's openness and suggestibility just rubbing off on you? Concepts like spiritual warfare and God's pursuit were so much easier before seminary and those pastoral counseling classes! Now you have some nagging questions about the overlap between psychology and theology, especially with the increasing advances in neuroscience. As an amateur musician yourself, you've always liked "creative types" and have observed that they do seem to pick up on things that others wouldn't have noticed. Their differently-calibrated personalities and peculiar conflicts can make for some pastoral care challenges.

A different beat

I use this opening vignette to provide an example of the types of questions that can arise when we have an opportunity to practice soul care with artists, or people with an "artistic temperament," or "highly creative individuals." As a professional pianist and pastoral psychotherapist living at the buckle of the Bible Belt⁴ in Music City,⁵ these folks are my community. Yet, aside from various resources on using creative practices as a tool for psychotherapy, little has been written about the dynamics and implications of practicing pastoral care and counseling *with* people who are extremely creative.

I suspect that some of our more analytical readers may be frustrated with me, wondering, "Is she talking about artists? or musicians? or anyone who is highly creative? And if creativity is something we all possess to a certain degree, what are her criteria for determining who has a 'high' amount?" The scope of my topic is admittedly messy and complex. I believe this is so because what we are really talking about is better classified as *transliminality*—the tendency of some persons to be more consciously aware than others of thoughts, emotions, sensory data, and

⁴ A colloquial term for the Southeastern United States, whose public culture tends to be more explicitly Evangelical Christian than in other regions of the nation.

⁵ A historic nickname for Nashville, Tennessee, due to its significance in the country music industry.

pretty much any so-called psychological material. Creative personality (as differentiated from creative achievement) is a component of it, and most but not all musicians and other artists are highly transliminal.

In this article I will explain what transliminality is, explore its neuroscience, encourage my fellow pastoral counselors and care providers to use it as lens for understanding their extra-creative clients, and offer five concrete suggestions for how we might customize pastoral care with transliminal artists. Before doing so, however, I want to explicate the generative metaphor of my title, “Of Unequal Temperament.” Moreover, I am intentionally expressing myself in a transliminal style—definitely less linear, and perhaps more colorful, than the typical academic article—since the best way to grasp this concept is more “right-brain” than “left-brain,” less analytically and more intuitively.

Calibrated Background Noise

Temperament is the inherited scaffolding upon which other aspects of personality are built. While different psychologists have different ways of classifying aspects of temperament (introverted/extroverted, moody/easygoing, focused/distractible, and so forth), there is general agreement that we are born with it (Zentner & Shiner, 2012, p. xi); it is the “nature” part of the nature versus nurture continuum. If you are asked to describe what someone is like, after mentioning demographic basics like sex, age, ethnicity, and occupation, you would probably soon move into the realm of temperament—are they shy, angry, laid-back, scatterbrained, aloof? Even more abstract, personality-related statements such as “she’s always the consummate professional” imply temperamental traits such as high energy, focus, and emotional regulation.

Where temperament often does *not* show up, however, is in the clinical studies that are used to help determine treatment recommendations for people who suffer mental and emotional

distress. Psychologists have designed numerous intricate experiments to compare and contrast the outcome rates for various types of talk therapies, psychopharmaceuticals, and placebos⁶ in order to track what works in alleviating depression and psychosis. These outcomes may be organized by patients' age or gender, but further analysis of their individual differences is unlikely. Yet, both common sense and on-the-ground clinical experience suggest that a person's temperament plays a significant role in affecting the following variables, among others: who tends to get depressed and in what way(s), who develops the conditions we consider to be serious mental illness, who flourishes with various types of psychotherapy and who comes across as "treatment resistant," who responds well to different kinds of psychotropic medicines, who often gets better after taking placebos, and who is most likely to participate in psychological studies in the first place.

At the risk of oversimplification, I would submit that ignoring the role of temperament in conducting psychological evaluations or interventions, particularly for persons with extreme suffering, is akin to performing a blood transfusion without first checking the patient's blood type. And it happens all the time. It also points to an important lacuna within the healing arts where pastoral therapists, with their roots in the care-of-souls tradition and their foliage colored by psychodynamic theory, have considerable expertise to contribute.

Tinkering with Timbre

Now I'd like to introduce another meaning of the word *temperament*, one which will be familiar to those of you who are musicians. Temperament in music refers to the way that the keys of a keyboard instrument are tuned.⁷ Since the early 20th century, the standard for most

⁶ See, for example, Elkin et al., 1989; Keller et al., 2000; Carpenter and Gold, 2002; Hollon et al., 2002; Hoffman et al., 2003; TADS Team, 2004; DeRubeis et al., 2005; Dimidjian et al., 2006; and Fournier et al., 2008.

⁷ Upon reading a draft of this manuscript, theologian and musician Joseph Strausbaugh observed that in both psychology and music, "temperament" concerns how tightly wound a person or instrument is!

Western music has been “**equal** temperament,” in which the twelve notes in an octave are spaced out evenly. This method gradually gained popularity during the 1800s for its convenience and versatility, but despite musicians’ awareness of it for centuries, equal temperament was long resisted because it was thought to sound bland (Gann, 1997).

Much richer and more tonally colorful, though less utilitarian, was the original Pythagorean tuning (or “**just** intonation”) whose intervals were based on mathematical proportions occurring in nature. The problem was that instruments could only sound that wonderful in certain keys, and if you transposed a song higher or lower, the music didn’t resonate in the same way and could end up sounding as strange as it originally had beautiful. Somewhere between the “pure” just/Pythagorean method and the “technical” method of equidistant tuning was “**well** temperament,”⁸ as in Bach's *Well-Tempered Clavier*. Well temperament is, well, good enough—not perfect, either in the aesthetic or the mathematical sense, but with slightly “off” intervals in each key that need not be detrimental and in fact can contribute to the character of the music.⁹

We moved from unequal to equal temperament because we wanted to be able to play any song in any key and have it sound the same: uniformity trumped contrast, sensitivity, the requirement of specialized (musical) knowledge to discern what actually sounds better under what circumstances. Just as our modern and postmodern eras ushered in biochemically-based medicines and globalization-based notions of what is normal (or ideal or “healthy”), they leveled the playing field of the musical keys. It sounds nice . . . in theory. “Equal” brings to mind notions of democracy and impartiality, whereas “unequal” stinks of favoritism and disparity. But people are not tuned the same, and pastoral care worth its name starts with thoughtful

⁸ For simplicity’s sake I am omitting meantone temperament, which developed around the late 1400s (Gann 1997), over two centuries before well temperament.

⁹ This is actually what Bach composed *The Well-Tempered Clavier* (1722/1742) to demonstrate (Rubenstein 2000).

listening to discern the care-seeker's God-given temperament.

More than meets the ear

I would like to propose a comparison between equal temperament and people who are thought of as psychologically “normal,” and between unequal temperament—with its potential for sounding incredibly harmonious *or* quite dreadful—and persons who have a wider range of mental, emotional, and spiritual movement. More specifically, I want to examine a particular kind of “unequal” human temperament that some researchers have begun naming *transliminality*.

This word may evoke echoes of Victor Turner (1969)'s concept of liminal space, and rightly so; transliminality also involves occupying both sides of a threshold (*limen-*) or boundary. In this case, however, the threshold is that of consciousness, and the “trans-” part refers to crossing it in both directions. Transliminality is “the hypothesized tendency for psychological material to cross thresholds into or out of consciousness” (Thalbourne & Houran, 2000, p.861), and some people have a lot more of it than others. The more transliminal you are, the more likely you are to be creative¹⁰ and suggestible, feel an extra-wide range of emotions, undergo psychosis, recall numinous dreams, have mystical experiences, and experience sensory overload—quite an array of characteristics.

Transliminality was discovered by accident by the late Australian psychologist (and parapsychologist) Michael Thalbourne. Himself a highly creative, transliminal scholar, Thalbourne struggled throughout his career to secure a respectable academic position because of his self-identity as a parapsychologist and his struggles with bipolar illness (Phillips, 2010, p.383). Thalbourne was trained at the University of Edinburgh, where parapsychology entails the

¹⁰ Here I am referring to creative personality rather than creative achievement; for more differentiation of terms, please see my 2012 paper, pp. 2-3, 8, and 12-13.

same rigorous methodology as its orthodox sister, but diverges in the contents of its scrutiny.¹¹ Though he built a sizable curriculum vitae of publications by channeling his paranormal research interests into studying various (mainstream) psychological aspects of paranormal beliefs, Thalbourne insisted upon remaining a parapsychologist at heart; a “crisis of religious faith” in his teens had led him to leave his Catholic upbringing (Thalbourne, 2005) and use his scientific training to investigate what William James might call the More (1902, p. 384).¹²

In one of his experiments in 1994, Thalbourne and his colleague Peter Delin were surveying different populations’ degrees of paranormal beliefs and experiences. They also measured “degree of creative personality, mystical experience, . . . magical ideation, hypomania, and . . . symptoms resembling mania and depression” (p. 3). To their surprise, every category they tested correlated with all of the others, in most cases significantly so (pp.16-19). Principal components analysis revealed that all of these attributes actually constitute a single factor, meaning they are aspects of one underlying “thing” rather than separate traits coincidentally found together (p. 20). Thalbourne and Delin named this thing *transliminality* (pp. 22ff)¹³ because all of its features seemed to involve having heightened conscious access to psychological phenomena (ideas, feelings, images, sensations) that most people do not experience to such a strong degree, if at all. Put differently, people with more transliminality have a more permeable threshold into their conscious awareness.¹⁴ Further research revealed that other “core correlates” of transliminality (in addition to the original six) include “general religiosity[,] . . . frequency of dream-interpretation” (Thalbourne & Houran, 2000, p. 854),

¹¹ For more information, please visit their website at <http://www.koestler-parapsychology.psy.ed.ac.uk/index.html>.

¹² A tongue-in-cheek referent to Thalbourne’s biblical literacy is his christening of the Sheep-Goat Scale, which measures people’s degree of paranormal belief (Thalbourne 2010; cf. Matthew 25:31-46).

¹³ Apparently not realizing that the term “transliminal” was used as early as 1909 with similar intent (see Phillips, 2010, p.385; Lange et al., 2000, p.592).

¹⁴ Psychoanalytic therapist and psychiatric nurse practitioner Jennifer Scroggie (2014) comments that in psychodynamic terms, high transliminals find it easier to bypass the repression barrier.

“[s]chizotypal personality, fantasy-proneness, absorption and hyperaesthesia¹⁵” (p. 855).¹⁶

I suspect that when we talk about someone having a “creative personality” or an “artistic temperament,” often what we really mean is that she or he is highly transliminal—extra sensitive, literally seeing or feeling things that others don’t, somehow in touch with a reality beyond what most “normal” people access on a given day. There has been quite a bit of scientific speculation, and a limited but increasing amount of experimental investigation, into the neuroscience that accompanies high amounts of transliminality. Most of this research is not directly about transliminality (the term is not yet considered mainstream in psychological literature¹⁷), but rather falls under the rubric of “creativity and psychosis” studies. Because transliminality encompasses both creativity and psychosis-proneness and is one way of naming the apparently-inherent connection between them, my working hypothesis is that the same neuroscience behind the creativity/psychosis overlap is what is going on with transliminality.

Below I will discuss what we know so far about the *neuroelectrical activity* (brain waves), *neurotransmitters*, and hypothesized *neurocognition* of people who are very transliminal. My hope is that pursuing this avenue of knowledge will help us to better understand—and thus provide better pastoral care for—the people in our communities who have this particular kind of “unequal temperament.” The information that follows is fairly technical, and readers who are less interested in the neuroscience of transliminality than in the practical application of this knowledge may wish to skim the next three sections and resume reading at the bottom of p. 17, “Learn to live with what you are.”

Picking Up Good Vibrations

¹⁵ That is, acute sensory sensitivity

¹⁶ For an excellent overview of transliminality, please see “The Concept,” 2010.

¹⁷ Thalbourne and Storm (2010) found 74 articles related to transliminality at the time of their last online search (p. 194) before publishing their bibliography. My Google Scholar search of “transliminality” on 12 April 2014 resulted in 186 more articles published in 2010 or afterward, though they vary in their degree of relevance.

One way we have of measuring the amount of activity going on in various parts of the brain is with an electroencephalogram (EEG), which records the electrical frequencies of large groups of neurons firing in different areas; these can then be plotted onto a topographical map. Different frequency ranges, as measured in Hertz (waveform cycles per second), are named after the Greek letters *delta* (<4 Hz), *theta* (4-7 Hz), *alpha* (8-15 Hz), *beta* (16-31 Hz), and *gamma* (32+ Hz). Delta waves are generally associated with sleeping, theta with deep relaxation, alpha with calmness or meditation, beta with active thinking and problem-solving (Herrmann, 1997), and the more recently-discovered gamma waves are thought to involve higher-order cognition and consolidation of information (Herrmann et al., 2010, p. 989).

In one of the few physiological studies on transliminality to date, Jessica Fleck and colleagues (2008) took baseline EEG measurements of the brains of people who scored high and low on Lange's (2000) *The Revised Transliminality Scale* (RTS) and found differences in three key areas: the left posterior association cortex, the right superior temporal region, and the frontal-midline region. The first two areas have less alpha, beta, and gamma activity in highly transliminal people, while the third area is marked by more gamma activity in transliminals.

The left posterior association cortex is a "polymodal association region" (Fleck et al., 2008, p.7) thought to be involved with synesthesia, though it is unclear why transliminal people have *less* activity in this part of the brain, since transliminality often involves hyperesthesia and/or synesthesia.¹⁸ Similarly, the right superior temporal lobe is associated with a key characteristic of transliminality—in this case, insight-based creative problem solving (p. 8)—so it is not surprising that brain wave differences show up here as well, yet again the high transliminals actually have lower powers of EEG activity in this region.

¹⁸ Fleck, et al. also comment that the lower amounts of neural firing could be due to lesser brain volume in this region, which other studies have linked to symptoms of schizophrenia, but point out that this is only one of many possible explanations.

However, the brain region where people high in transliminality have *more* gamma activity than their less-transliminal counterparts is the medial-frontal cortex (Fleck et al., 2008, p. 9). There are several theories about what sorts of activities this region coordinates,¹⁹ with the common ground being some sort of careful self-awareness and forethought. Given this information, Fleck and colleagues' hypothesis is that people with high transliminality, who "report an increase in perceptual aberrations and unusual experiences," consequently have a greater "need to utilize higher-level cognitive control to organize incoming stimuli that would otherwise result in sensory confusion" (p. 9).

In contrast with other studies that associate the personality traits of openness and psychoticism/creativity with increased theta wave activity (e.g., Hunt, 2007, p. 221, 226, citing Stough et al., 2001 and Glicksohn & Naftuliev, 2005), Fleck et al.'s EEG study "revealed no significant differences between high- and low-transliminality groups in the delta or theta frequency bands" (2008, p. 6). This difference in results could stem from methodological differences in the experiments, or from differences between transliminality itself versus its correlates of openness and psychoticism/creativity; more research is needed to replicate, refine, and interpret Fleck and colleagues' findings. At present we have evidence that highly transliminal people's neuroelectrical activity is indeed different from that of their less transliminal counterparts, but what exactly this variation translates into phenomenologically is still a matter of conjecture.

A Little Too Much Information

By now neurotransmitters are familiar to most people in the mental health field, between the popularity of selective serotonin reuptake inhibitors (SSRIs) as a remedy for depression and

¹⁹ Ridderinkhof et al. (2007, p. 262-3) list "conflict monitoring," "outcome evaluation," "risk prediction/error avoidance," "cost-benefit analysis," and "regulative control."

anxiety, and studies linking addictions to altered dopamine circuitry (e.g., Lambe & George, 2009). These chemical molecules carry signals from neuron to neuron and are essential micro-messengers for starting the chain reactions (Boron & Boulpaep, 2011, p.331) to organize physical coordination, memory, emotions, language, and all the other functions of our nervous systems. At least three in particular—dopamine, serotonin (e.g., Barrantes-Vidal, 2004, p. 74) and norepinephrine (Folley et al., 2003)—are associated with creativity *and* thought to be involved in the psychopathology of mood disorders and schizophrenia; thus they may be connected with the trait of transliminality, which seems to predispose people to either or both of these possibilities.

Of the three, the most specific linkage to transliminal cognitive and emotional processes appears to be with dopamine. Dopamine in general, and D2²⁰ receptor expression in particular, has been associated for at least two decades with the “divergent thinking” aspect of creativity (Chermahini & Hommel, 2010, pp.458-9) that involves free association to a wide range of ideas or possible solutions. (Its opposite process, convergent thinking, uses logic to narrow down options to “converge” upon one best answer.)

In a 2010 paper entitled “Thinking Outside a Less Intact Box: Thalamic Dopamine D2 Receptor Densities Are Negatively Related to Psychometric Creativity in Health Individuals,” authors Örjan de Manzano and colleagues describe an experiment in which they moved one step closer to understanding the relationship between dopamine and divergent thinking. Building upon past research linking schizophrenia with altered D2 levels in patients’ thalamus and striatum regions, de Manzano et al. decided to focus their analysis upon these two areas (p. 2). They used MRI and PET scan imaging to examine the brains of people who score high on measures of divergent thinking—people we might expect to be creative and transliminal.

²⁰one of the subtypes of dopamine

While “[t]here was no significant correlation between divergent thinking and D2 B[inding] P[otential] in the striatum” or its subregions (p. 2), the authors discovered that in the *thalamus* regions of highly divergent thinkers there are fewer D2 receptors than usual. This finding is significant because the thalamus is centrally located and extensively connected to several crucial brain regions—“the associative and limbic areas of the cortex, those that receive input from the cerebellum and basal ganglia and project to the motor regions of the frontal lobe, and those that transmit general and special sensory information to corresponding parts of the sensory cortices” (Donnelly, 2014, p.199)—and “direct causal evidence” has been found that “the thalamus exerts regulatory control over ongoing cortical activity” (Malakmohammadi et al., 2014, p. 9). The thalamus is thought to relay information related to physical movement, vision, hearing, touch, sleep and wakefulness, arousal, and consciousness (Crossman & Neary, 2010, pp.122-125). Meanwhile, “[d]opamine D2 receptors constrain communication between brain regions” (Grant, 2010, p. 24).

Thus, de Manzano and colleagues take their finding that highly creative people have fewer thalamic D2 receptors to mean that “the creative bias may . . . bring a risk of excessive excitatory signals from the thalamus overwhelming cortical neurotransmission, with ensuing cognitive disorganization and positive symptoms” (2010, p. 3).²¹ This interpretation is strikingly compatible with Fleck and colleagues’ hypothesis about why very transliminal people have extra gamma frequencies produced by their medial-frontal cortices. Highly transliminal people’s neuroelectrical activity and neurotransmitters appear to be different from the norm in ways that suggest perceptual and sensory overload and an accompanying need for metacognition. So far, the evidence does indicate that their threshold (*limen-*) into consciousness is more crossable

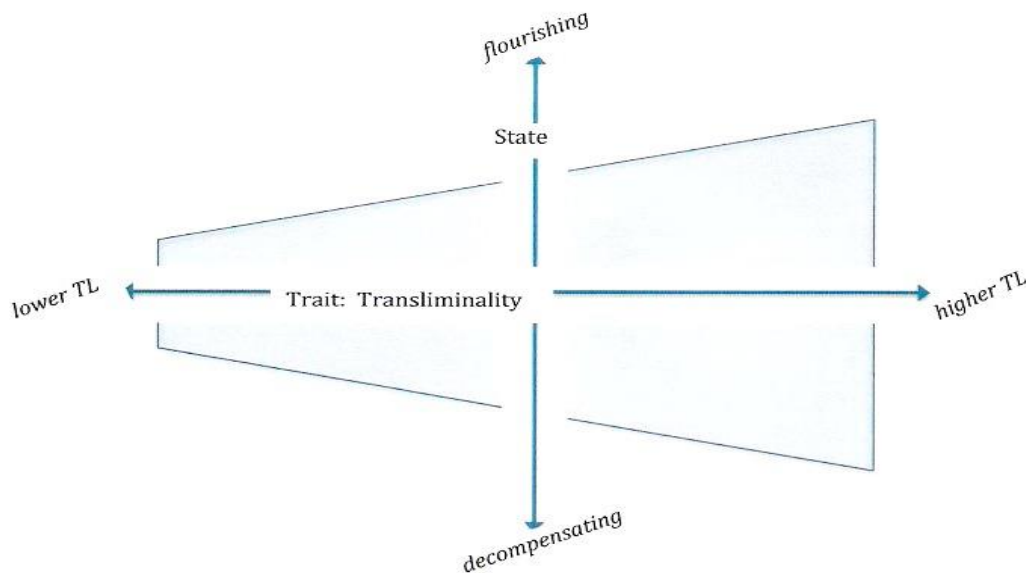
²¹ In the context of schizophrenia or psychosis, “positive” and “negative” signify “extra” or “missing” phenomena, respectively, rather than whether a symptom is advantageous or detrimental. Positive symptoms refer to hallucinations or delusions, while negative symptoms can include deficits in memory, cognition, or affect.

(*trans-*) than that of other people. Just as the word “transliminal” suggests, persons with this trait appear to have more psychological material entering their awareness, as well as a corresponding need to expend more mental energy “sifting” and organizing it.

It's All Connected

Now that we have looked at the anatomical and electrical aspects of the neuroscience of transliminality, let's examine how its physiology gets “translated” into the cognitive processes that mark transliminal people's patterns of thinking, feeling, and awareness. Here I am drawing from the psychological literature on “creativity and psychosis,” or, more broadly, “creativity and psychopathology.” In general, researchers' consensus is that highly creative (and I would posit transliminal) persons' thought processes are more divergent than convergent, as discussed earlier. Another way to describe this pattern is that transliminal thinking is more associative than goal-related, with less “‘top-down’ or expectation-driven information processing” (Abraham et al., 2005, p. 523) than in other people.

Harvard lecturer Shelley Carson has developed a model to help parse out how exactly the same giftedness of creativity carries a predisposition “for certain forms of psychopathology, including mood disorders, schizophrenia spectrum disorders, and alcoholism” (2011, p.144). Her “shared vulnerability model” encompasses three factors that appear to be inherent to both creativity and psychopathology, and three factors whose ranges determine whether creativity or psychopathology is likely to be dominant in a person. Another way to conceptualize this idea is, if we envision transliminality as a continuum in which higher levels contain a greater range for flourishing versus decompensation,



Carson has identified three factors that help determine a person’s horizontal positioning on the map (i.e., how transliminal s/he is), and three that affect the vertical positioning s/he tends to inhabit.

Lower latent inhibition. The first factor in Carson’s model shared by people who are “vulnerable” to both creativity and psychopathology involves latent inhibition (LI), which is “the capacity to screen from conscious awareness stimuli previously experienced as irrelevant” (2011, p.147). In high transliminals, with their divergent, free-associative thinking, nearly everything seems potentially relevant. Transliminal people’s LI is thus lower than their less creative/psychosis-prone counterparts’. This reduced-LI tendency is related to scoring high on the personality dimension of “openness to experience” (p. 147).

Novelty seeking. Carson’s second “shared vulnerability” factor is the tendency to seek out new and complex stimuli. While this description sounds a lot like the first factor, lower LI is more a matter of creating more *availability* of stimuli, whereas novelty seeking involves the emotional predisposition or “intrinsic motivation” to attend to them (p.147). Novelty seeking is

thought to be related to the dopamine system and is associated with creativity, mania, and addictions (p.147).

Neural hyperconnectivity. The third cognitive factor present in both the light and shadow sides of high transliminality is “an abnormal neural linking of brain areas that are not typically functionally connected” (p.147). That highly creative persons have extra neural connections is not surprising, given what we have already seen about their divergent thinking patterns, reduced thalamic dopamine gating, and likelihood of having synesthesia. It also makes intuitive sense that people who are able to see connections that others aren’t, have neurological interconnections that others do not.

IQ level. So what elements affect whether a highly transliminal person with lower LI, novelty-seeking inclinations, and neural hyperconnectivity tends more toward creative flourishing, or more toward psychopathology and/or addiction? The first “protective factor” that Carson identifies is a high IQ, which has been shown to be “necessary but not sufficient to explain [high] creativity” (p.148). Given research by Barnett et al. (2006) that demonstrates the protective effect of high IQ against severe psychopathology, she hypothesizes that increased intelligence allows people with extra neural connections and low latent inhibition “to process and manipulate the additional stimuli rather than becoming confused or overwhelmed by it” (Carson, 2011, p.148, citing Carson et al., 2003).

Working memory. Also necessary for this extra processing is having sufficient working memory capacity to hold multiple stimuli, ideas, experiences, and so forth in mind simultaneously. Carson speculates that “enhanced working memory” predisposes a person toward creativity (2011, p.148) by providing the mental scaffolding for disparate ideas to coalesce into relevant insights, while deficits in working memory can contribute to the shifting

states of “disordered cognition.”

Cognitive flexibility. Related to IQ and working memory, but distinct in its function, is Carson’s third protective factor that predicts whether transliminals tend toward creativity or pathology: cognitive flexibility. Because it entails “switch[ing] mental states” and taking in multiple perspectives and—like reduced LI—is related to “openness of experience” (pp.148-9), cognitive flexibility at first appears to be a “horizontal” feature like divergent thinking that inclines a person toward transliminality in the first place, rather than a “vertical” feature that helps regulate transliminal flourishing versus decompensation. The key difference between the “switching” of cognitive flexibility and that of low latent inhibition is that the former is under a person’s conscious control. Carson points out that cognitive flexibility allows someone “experiencing magical thoughts or unusual perceptions” (two hallmarks of transliminality) to “disengag[e] attention” from them or to develop a benign interpretation rather than assuming they are going crazy (p. 149). Similarly, research by Emmanuelle Peters and colleagues has shown that lasting psychopathology is not so much a matter of *having* unusual perceptions or experiences, as it is their content, “the extent to which they are believed, how much they interfere with one’s life, and their emotional impact” (1999a, p. 92).²²

Learn to live with what you are

Now that we have examined the neuroscience associated with transliminality, what do we do with this knowledge? This is not just an academic question. People who fit this personality profile are in our pews, sitting at piano benches and on drum stools, coming to us for counseling or simply a listening ear, or standing in the background because the stimulation of group interaction is just too much, or not attending church anymore because the draw of Buddhist

²² See also Peters et al., 1992b.

meditation or energy healing or chanting kirtan is more appealing to their needs and tastes. Often but by no means always artists of some sort, they may seem spacy, moody, high-strung—or insightful, devout, spiritual in a more tangible and personal way than the typical congregant (or clergyperson!).

Pastoral care with transliminal people matters because we have lost far too many of them to suicide.²³ Schizophrenia, depression (bipolar and otherwise), and addictions may merely be words on a page when discussing disordered thought patterns and dopamine regulation, but in real life they are devastating, sometimes even deadly. As practitioners, we walk a tightrope between over-pathologizing unconventional experiences or behavior, on the one hand, and, on the other, failing to take deep human pain seriously because we are blinded by the giftedness that accompanies it. Either error can bring serious consequences, and we need more research in this area to increase our *phronēsis* (practical wisdom).

As a beginning step toward this end, below I will offer five suggestions for providing pastoral care to artists and other highly creative, transliminal people. These recommendations stem from a combination of research, anecdotal evidence, personal and clinical experience, and educated guesswork and are by no means exhaustive.

Into the mystic

1) *Take persons' unusual experiences seriously and connect them with resources in their faith tradition.* Transliminal people may see visions, hear voices, sense the presence of spirits, be attuned to energetic variations, and they are likely to have mystical experiences and meaningful dreams (Thalbourne & Houran, 2000, p.854). Their perceptions might seem vague—like the sense of Jacob, in our opening anecdote, that something was “spiritually wrong” in the

²³ Here I am speaking from raw experience: my close friend, my friend's father, my father's cousin, my husband's close friend, our pastor's son. But the list of creative folks in the public eye who have died from drug overdose and/or suicide is long—Philip Seymour Hoffman, Amy Winehouse, Heath Ledger, Kurt Cobain, to name but a few.

sanctuary where he was recording—or definite and specific, such as claiming to see or hear Jesus or God. Unbelievable as these occurrences might seem (at least, in the realm of reality rather than psychological phenomena) to less transliminal folks, our world’s religious traditions are filled with saints and mystics who made similar claims. In the Christian tradition, St. Ignatius of Loyola’s mysterious encounter with God amid the ten months he lived in a cave at Manresa taught the future founder of the Jesuits “more . . . than he [learned] in the rest of his life” (O’Neal, 2003); Julian of Norwich’s last-minute healing from death’s door was marked by “showings,” beginning with a detailed vision of Jesus’ face while he was dying on the cross (Crampton, 1994); and St. Teresa of Avila experienced such raptures during prayer that she would sometimes reportedly levitate, calling the other “nuns to sit on her and hold her down” (Matz, 1996)! Moreover, many of the desert abbas and ammas and early monastics probably would not fit into our contemporary criteria for psychological health.²⁴

Offering pastoral care to people of “unequal temperament” may include introducing them to biographies of Mothers and Fathers in the faith who had similar inclinations and experiences, and who learned to channel their energies and interpret their perceptions using spiritual disciplines. St. Teresa of Avila’s *Interior Castle* or St. John of the Cross’s *Dark Night and Ascent of Mt. Carmel* can provide companionship from kindred souls, as well as templates for processing the different seasons and phases in the journey of spiritual formation. Using the prayer practices of Christian mystics, such as following St. Ignatius’ *Spiritual Exercises* or listening to the beautiful hymns of St. Hildegard of Bingen²⁵, may resonate with the introspective, aesthetic nature of many transliminals.

Spiritual emergenc(i)es

²⁴ For more information and discussion, see Egan, 1991, beginning with his Introduction.

²⁵ For a full discography, see Roberge, 2013. Recordings of many of Hildegard’s chants are also available at song shaman Norma Gentile’s website, <http://www.healingchants.com/hct.html>.

2) At the same time, we should *encourage contemplative spiritual practices, but with certain precautions, and within community*. With artists' and other transliminal people's sensitivity to all kinds of stimuli, whether sensory, spiritual, or unconscious, they are more likely to be overwhelmed by material (for example, feelings, phrases, ideas, images, sensations) that arises during prayer or meditation. This pattern has been observed primarily in the context of Eastern religions, particularly when they are transplanted into Western cultures (Grof & Grof, 1989; Britten, 2011a, 2011b), yet my hunch is that there are enough similarities between the practices of, for instance, Buddhist insight meditation and Christian centering prayer, that highly sensitive people who practice extended forms of contemplation may open themselves to certain "symptoms" regardless of the spiritual tradition of their context.

In 1980, transpersonal psychologists Stanislav and Christian Grof created the term "spiritual emergency" to name the distress that can ensue as an unforeseen side effect of spiritual growth. More recently, clinical psychologist and advanced Buddhist meditation practitioner Willoughby Britten of Brown University has founded the Dark Night²⁶ Project, now called "The Varieties of Contemplative Experience" (Britten, 2013), to track and study these types of spiritual emergencies. Some of the symptoms commonly reported by people going through "the difficult stages of the contemplative path" (Britten, 2011a) include an "increased sampling rate of reality," "stimulus overload," cognitive disorientation, depersonalization, losing one's sense of time and self, "existential primal fear," manic euphoria, depressive nihilism, feelings of electricity or vibrational energy, other perceptual changes, and usually "a de-repression of [whatever] psychological material" a person carries (2011b). Many sufferers are diagnosed with

²⁶ The name of the first Buddhist Geeks podcast on this topic was "The Dark Side of the Dharma," presumably a play on words from the term "Dark Night of the Soul" coined from St. John of the Cross's poem *The Dark Night*. Where the "dark nights" of the Buddhist and Christian contemplative paths overlap and diverge psychologically is an open question.

schizophrenia or bipolar disorder by Western doctors unfamiliar with the pitfalls of the meditative path (2011a).²⁷ While Britten and her team’s research has not yet elucidated why some people are more vulnerable to these experiences than others, or why some spiritual emergencies last much longer than others, they have found that the average duration for a “dark night” stage so severe that it interferes with normal life/work functioning is a whopping 3.4 *years* (2011b)—enough to give any spiritual (and/or mental health) practitioner pause. It would stand to reason that highly transliminal people, whose thresholds into conscious awareness are already very open, may be especially susceptible to entering these complex, overaroused states.²⁸

While passing through the dark night may be unavoidable if one is to experience spiritual growth (Britten, 2011b),²⁹ psychologists like Britten, Grof, and Grof are committed to making sure that people who suffer these seasons find the support they need to come out on the other side. Strikingly, I have yet to come across a researcher in this area who recommends that people discontinue their spiritual paths altogether, though temporary breaks from introspective practices are sometimes advised (Lukoff et al., 1998, p.41, citing Grof & Grof, 1989). Likewise, my suggestion here for pastoral care would be to make sure that people who seem especially transliminal have some sort of close-knit community support—or, if possible, an experienced spiritual director—before beginning in-depth engagement with contemplative prayer practices. It also seems advisable to share information with them upfront about the physiological “side effects” that can sometimes come upon sensitive people as they move through intensive spiritual

²⁷ In a clinical psychology class, when I played an excerpt of the Britten, 2011b podcast where she describes the above “dark night” symptoms, a fellow student who missed the introduction assumed that the topic being discussed was the prodromal phase of psychosis.

²⁸ For helpful information in discerning whether someone’s symptomatology reflects a spiritual emergency or an impending psychotic break, please see Lukoff et al., 1998, especially pp.39-40.

²⁹ Here I am referencing the Buddhist teacher who answered Britten’s question of how many practicing meditators undergo harrowing experiences, “100%.” This answer is only one teacher’s opinion, and again, it is uncertain how far the phenomenon extends to Christian contemplative practice. Yet the decades-long dark nights of Mother Teresa and, of course, St. John of the Cross come to mind.

practices. And attending shared rituals from deep in the Christian tradition, such as the services of the Daily Office,³⁰ can help offset dramatic interior events with the calming rhythms of community worship.

I've got my feet in the clouds, got my head on the ground

3) My third recommendation is both for people going through spiritual emergencies and for those whose transliminal experiences are less dramatic: *Balance esoteric perceptions with grounding in the body and nature*. Here St. Teresa of Avila's 16th-century advice for depression still holds—go where you can “see the sky and take a walk” (Matz, 1996). Grof and Grof similarly suggest “regular light exercise” and gardening, as well as a change of “diet to include more ‘grounding food’ (such as red meat)” (Lukoff et al., 1998, p.41). One ancient Christian practice combining body, mind, and spirit is to prayer-walk around a labyrinth.³¹

Jungian and cognitive psychologist Harry Hunt theorizes that the therapeutic effect of bodily “grounding” involves the vestibular balance system, which was observed by Paul Schilder in 1942 to have specific deficits in people suffering from “psychiatric hallucinatory syndromes” (Hunt, 2007, p.220). Conversely, Hunt's research shows that “the more integrative transformations of consciousness associated with spontaneous mystical experiences, meditative states, and lucid and creative/metaphoric forms of dreaming are correlated with superior performance on . . . measures of physical balance and spatial skills” (pp. 220-1). He “makes a strong case that the emotional tone of unusual psychological states rises or falls proportionally with one's ‘sense of embodiment’ and spatial orientation or lack thereof” (Kreiselmaier, 2012, p.28). Thus, therapies such as the Alexander Technique, a mind-body method found in many music schools that promotes subtle relaxation through retraining kinesthetic awareness, may

³⁰ A daily cycle of prayers found in the Anglican tradition

³¹ For a brief history, see <http://www.creativeprayer.com/labyrinths/history-of-labyrinths/>.

exert additional prophylactic benefits on high transliminals by strengthening their sense of *ipseity* (selfhood).

Canary in a Coal Mine

4) Mentioning the Alexander Technique brings me to my fourth point: “*New Age*” or *complementary/alternative medical (CAM) practices encompass a broad territory, and we need to develop criteria for distinguishing between wheat and chaff*. As we often discuss in pastoral theology circles, these days “spiritual” is a loaded word that can refer to anything from praying the rosary to reading crystals. Many popular CAM practices such as yoga or mindfulness meditation have roots in Eastern religious traditions, leading some Christians to keep their distance even if the popular versions have been secularized. Meanwhile, forms of “energy healing” or “energy work” abound—most commonly Reiki, but also craniosacral therapy, jin shin jyutsu, meridian therapy, and the Brennan method, to name a few—while as yet there is not scientific consensus about what exactly “energy” or *chi* is or how it operates. At the same time, as theologians Tilda Norberg and Robert Webber put it, “much of the evidence for healing would be considered anecdotal (but what anecdotes!)” (1998, p.30).

What is the connection here to transliminality? As I alluded to earlier, people with this kind of temperament are likely to be attracted to things outside the mainstream, which in Western Christian culture encompasses Eastern religions and the plethora of modalities that are often grouped under the rubric of “New Age.” Thalbourne and Houran found that people who score high on the Transliminality Scale also score high on “reading about Eastern religions[,] but not Bible-reading”; they note that “an alternative religiosity is thus suggested” (2000, p.855). Transliminality has likewise been linked directly (Lange et al., 2000, p.605) and indirectly (Grandqvist, 2005, p.2) with New Age beliefs and attitudes. I would speculate that there are also

plenty of Christian transliminals out there(!), but that their sensitivity to subtle sensations of all kinds, combined with their strong novelty-seeking tendencies, attracts them to “supplement” traditional Christianity with practices from other spheres that have often been more sympathetic to esoteric ideas and attentive to bodily states than their native faith.³² Moreover, so-called complementary and alternative medical practices—which often derive from Eastern medicine and culture, whether or not they are deemed New Age—can be a source of life-changing healing for people who are suffering. With their keen awareness of their own physiology, creative, transliminal people tend to be the proverbial “canaries in the coal mine” who notice slight symptoms of dis-ease earlier than most.³³ It makes sense that persons with heightened sensitivity as well as suggestibility³⁴ would benefit from modalities that are said to involve subtle energetic shifts and clearing.

If part of pastoral care with the artists and other transliminal folks in our communities involves matching them with resources that increase their wellbeing, we need to consider the possibility that some CAM practices may be a source of God’s healing in their lives. How do we separate the wheat from the chaff, guarding against superstition and pseudoscience while at the same time taking care not to quench the Spirit’s fire (1 Thess. 5:19) by discounting ways that God may be at work? We might exercise the discernment of spirits by asking several questions of each practice:

³² Here I am speaking primarily of modern Protestantism (which still describes many mainline churches even if we consider ourselves to be living in postmodern times), as this is what seems to be negatively correlated with transliminality in the research. The Catholic tradition, with its respect for mystical theology, may in some aspects of its teachings and practices be more simpatico with transliminal temperament.

³³ I am grateful to holistic physician Dr. David Forbes, MD, of Nashville Integrated Medicine for this insight during a conversation in 2006.

³⁴ A trait related to magical ideation, one of the components of transliminality. See also Grandqvist, 2005.

- Does it mesh with sound theology? In particular, are there hints of Gnosticism—is healing viewed as contingent upon esoteric knowledge only available to a minority of people, or does it elevate the spirit over the body (or vice versa)?
- Is there science to back it up, and if not, are practitioners aware of and honest about that? If what we usually call the “placebo effect” brings healing, then that too is effective (Frank & Frank, 1991, Chapter 7), but ideally healers will be transparent about the “active ingredients” of their modalities.
- Are there any questionable ethical or financial overtones?
- Does it lead to integration and flourishing, not only of persons (body, soul, and spirit), but also of relationships and community? Some “spiritual but not religious” practices encourage privatization, while others build connection with Godself and other selves beyond our own.

She moves in mysterious ways

5) What I am advocating for in all of these pastoral care recommendations is that we *dare, following the example of Jesus, to use suggestibility and altered states in God’s service.* These characteristics may not fit into our current cultural milieu as naturally as in 1st-century Palestine, but they are part of how some of us are “fearfully and wonderfully made” (Psalm 139:14)—and just as we encounter unexpectedly rich musical nuances when we bypass the modern standard of tuning keyboard instruments to “equal temperament,” we open ourselves to gifts of spiritual sensitivity, intuitive depth, and transcendent experience when we seek to understand the transliminal artists among us and use this understanding to inform our pastoral care.

If we temporarily bracket our methods of historical and textual criticism and take the gospel texts at face value, we can see many instances where what we now might call transliminality serves as a conduit for healing and meaning-making. During the three or so years of Jesus' ministry, he went around healing people, performing miracles, and proclaiming the kingdom of God. The context of many of his miracles involves conditions where people would be in a more vulnerable or "open" state of consciousness (similar to where extra-transliminal folks live much of the time?): for instance, when he raises Lazarus (John 11:1-45), a widow's son (Luke 7:11-17), and Jairus' daughter (Matthew 9:18-26, Mark 5:21-43, Luke 8:49-56) from the dead, their families and communities have already entered into grief and mourning, with the scriptural accounts describing emotional weeping and wailing. When he walks on water out to his disciples' boat (Matthew 14:22-36, Mark 6:45-56, John 16:21), it is in the middle of a frightening storm, and the disciples' fear has them in such a state of overarousal that at first they think they are seeing a ghost. After each of these events,³⁵ word spreads, and people come to believe in and follow Jesus, bringing more people to him for healing and exorcism. Additionally, before the excruciating events of his torture and crucifixion, Jesus brings his closest three disciples onto a mountaintop where they see his clothes become blindingly white as he begins a conversation with the long-dead seminal prophets Moses and Elijah (Matthew 17:1-9, Mark 9:2-10, Luke 9:28-36)—an altered state of consciousness if ever there was one!—perhaps to impress upon their minds an indelible image of his glory that they can hang onto during what lies ahead.

In seven out of his eighteen recorded healings, Jesus declares to the person, "Your faith has made you well (Norberg & Webber, 1998, p.42). To the paralyzed man lowered through the

³⁵ Except for the healing of Jairus' daughter, which is one of the times Jesus tells witnesses not to say anything about what they've seen (Mark 5:43, Luke 8:56)—although if Matthew's account (9:26) is correct, apparently this didn't work!

roof, prior to telling him to take up his mat and walk, Jesus affirms, “Your sins are forgiven” (Matthew 9:2-8, Mark 2:12, Luke 5:17-26). We do not know the causes behind the illnesses and paralyses cured by Jesus, but if there were psychosocial factors involved (for example, a psychosomatic element of being “paralyzed” by guilt), it appears that Jesus—like shamanic healers and psychotherapists the world over (Frank & Frank, 1991)—used the gateway of suffering persons’ suggestibility, their vulnerability, their openness to a new and better experience, to transmit divine restoration. Was the means of healing something we do not yet understand? Was it a form of energetic touch or a sophisticated placebo effect? The answer is a holy mystery. But I would assert that making use of placebo and the power of suggestion in our pastoral caregiving need not be feared, only respected and used through prayer, if the fruits these yield are belief, faith, healing, and freedom.

Dal Segno al Fine

I have depicted some of the dual joys and challenges, as well as the complex questions, that can arise when we encounter and participate in soul care with artists and other highly creative people. Using the trait of transliminality as a lens to focus our inquiry, I’ve discussed some of the particular neuroscientific aspects of persons with this type of “unequal temperament.” And from this information, I have proposed five specific pastoral care recommendations as a starting point for ministering to (and with) transliminal people in a way that aligns with their God-given makeup. It is my hope that as our learning increases, we will grow in our ability to appreciate the gifts, and alleviate the sufferings, of these distinctive people—not to help them become more “normal,” but more whole; not to render them equal- (or even-)tempered, but *well*.

References

- Abraham, A., Windmann, S., Daum I., & Güntürkün, O. (2005). Conceptual expansion and creative imagery as a function of psychoticism. *Consciousness and Cognition*, 14, 520–534.
- Aron, E.N. (1997). *The highly sensitive person*. New York: Broadway Books.
- Barnett, G.H., Salmond, G.H., Jones, P.B., & Sahakian, B.J. (2006). Cognitive reserve in neuropsychiatry. *Psychological Medicine*, 36(8), 1053-1064.
- Barrantes-Vidal, N. (2004). Creativity and madness revisited from current psychological perspectives. *Journal of Consciousness Studies*, 11(3-4), 58-78.
- Boron, W.F., & Boulpaep, E.L. (2011). *Medical Physiology* (2nd ed.). Philadelphia: Saunders.
- Britten, W. (2011a, Sept.) BG 231: The dark side of the dharma. Available from Buddhist Geeks online at <http://www.buddhistgeeks.com/2011/09/bg-231-the-dark-side-of-dharma/>, accessed 13 April 2014.
- Britten, W. (2011b, Sept.). BG 232: The dark night project. Available from Buddhist Geeks online at <http://www.buddhistgeeks.com/2011/09/bg-232-the-dark-night-project/>, accessed 13 April 2014.
- Britten, W. (2013, Nov.). BG 301: Varieties of contemplative experience. Available from Buddhist Geeks online at <http://www.buddhistgeeks.com/2013/11/bg-301-varieties-contemplative-experience/>, accessed 14 April 2014.
- Carpenter, W.T.& Gold, J.M. (2002). Another view of therapy for cognition in schizophrenia. *Biological Psychiatry*, 52, 969-971.
- Carson, S.H., Peterson, J.B., & Higgins, D.M. (2003). Decreased latent inhibition is associated with increased creative achievement in high-functioning individuals. *Journal of*

- Personality and Social Psychology*, 85(3), 499-506.
- Carson, S.H. (2011, March). Creativity and psychopathology: A shared vulnerability model. *Canadian Journal of Psychiatry*, 56(3), 144-153.
- Chermahini, S.A. & Hommel, B. (2010). The (b)link between creativity and dopamine: Spontaneous eye blink predict and dissociate divergent and convergent thinking. *Cognition*, 115, 458-465.
- “The Concept of Transliminality.” (2010). Available from the Australian Institute of Parapsychological Research, Inc. online at http://www.aiprinc.org/The_Concept_of_Transliminality.pdf, accessed 12 April 2014.
- Crampton, G.R. (1994). *The shewings of Julian of Norwich: Introduction*. Kalamazoo, MI: Medieval Institute Publications. Available from the University of Rochester Library online at <http://www.lib.rochester.edu/camelot/julianin.htm>, accessed 13 April 2014.
- Crossman, A.R.& Neary, D. (2010). *Neuroanatomy: An illustrated colour text* (4th ed.). London: Churchill Livingstone.
- de Manzano, Ö., Cervenka, S., Karabanov, A., Farde, L., & Ullén, F. (2010, May). Thinking outside a less intact box: Thalamic dopamine D2 receptor densities are negatively related to psychometric creativity in healthy individuals. *PLoS ONE* 5(5), e10670, 1-6.
- DeRubeis, R.J., Hollon, S.D., Amsterdam, J.D., Shelton, R.C., Young, P.R., Salomon, R.M., O’Reardon, J.P., Lovett, M.L., Gladis, M.M., Brown, L.L., & Gallop, R. (2005). Cognitive therapy vs. medications in the treatment of moderate to severe depression. *Archives of General Psychiatry*, 62, 409-416.
- Dimidjian, S., Hollon, S.D., Dobson, K.S., Schmaling, K.B., Kohlenberg, R.J., Addis, M.E., Gallop, R., McGlinchey, J.B., Markley, D.K., Gollan, J.K., Atkins, D.C., Dunner, D.L.,

- and Jacobson, N.S. (2006). Behavioral activation, cognitive therapy, and anti-depressant medication in the acute treatment of major depression: Prevention of relapse effects. *Journal of Consulting and Clinical Psychology*, 74, 658-670.
- Donnelly, L. (2014, 1 April). The brain: Functional divisions. *Anaesthesia and Intensive Care Medicine* 15(4), 195-200.
- Egan, H. (1991). *An anthology of Christian mysticism*. Collegeville, MN: Liturgical Press.
- Elkin, I., Shea, M.T., Watkins, J.T., Imber, S.D., Sotsky, S.M., Collins, J.F., Glass, D.R., Pilkonis, P.A., Leber, W.R., Docherty, J.P., Fiester, S.J., & Parloff, M. B. (1989). National Institute of Mental Health Treatment of Depression Collaborative Research Program: General effectiveness of treatments. *Archives of General Psychiatry*, 46, 971-982.
- Fleck, J.I., Green, D.L., Stevenson, J.L., Payne, L., Bowden, E.M., Jung-Beeman, M., and Kounios, J. (2008). The transliminal brain at rest: Baseline EEG, unusual experiences, and access to unconscious mental activity. *Cortex*, 44(10), 1353-1363.
- Folley, B.S., Doop, M.L., & Park, S. (2003). Psychoses and creativity: Is the missing link a biological mechanism related to phospholipids turnover? *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 69, 467-476.
- Fournier, J.C., DeRubeis, R.J., Shelton, R.C., Gallop, R., Amsterdam, J.D., & Hollon, S.D. (2008). Antidepressant medications versus cognitive therapy in depressed patients with or without personality disorder. *British Journal of Psychiatry*, 192, 124-129.
- Frank., J.D.& Frank, J.B. (1991). *Persuasion and healing* (3rd ed.). Baltimore: Johns Hopkins University Press.
- Gann, K. (1997). An introduction to historical tunings. Available online at <http://www.kylegann>.
- Sacred Spaces: The E-Journal of the American Association of Pastoral Counselors, 2015, vol.7

- com/histune.html#hist6, accessed 11 April 2014.
- Geyer, M.A. & Vollenweider, F.X. (2008, Sept.) Serotonin research: Contributions to understanding psychoses. *Trends in Pharmacological Sciences*, 29(9), 445-453.
- Glicksohn, J., & Naftuliev, Y. (2005). In search of an electrophysiological index for psychoticism. *Personality and Individual Differences*, 39, 1083-1092.
- Grandqvist, P., Fredrikson, M., Unge, P., Hagenfeldt, A., Valind, S., Larhammar, D., & Larsson, M. (2005). Sensed presence and mystical experiences are predicted by suggestibility, not by the application of transcranial weak complex magnetic fields. *Neuroscience Letters*, 379, 1-6.
- Grant, R.P. (2010). Creative madness. *The Scientist*, 24(8), 23-27.
- Grof, S. & Grof, C. (Eds.). (1989). *Spiritual emergency: When personal transformation becomes a crisis*. Los Angeles: Tarcher.
- Heelas, P. & Woodward, L. (2005). *The spiritual revolution: Why religion is giving way to spirituality*. Malden, MA: Blackwell.
- Herrmann, C.S., Fründ, I., & Lenz, D. (2010). Human gamma-band activity: A review on cognitive and behavioral correlates and network models. *Neuroscience and Biobehavioral Reviews*, 34, 981-992.
- Herrmann, N. (1997). What is the function of the various brainwaves? Available from *Scientific American* online at <http://www.scientificamerican.com/article/what-is-the-function-of-t-1997-12-22/>, accessed 12 April 2014.
- Hoffman, R.E., Hawkins, K.A., Gueorguieva, R., Boutros, N.N., Rachid, F., Carroll, K., & Krystal, J.H. (2003). Transcranial magnetic stimulation of left temporoparietal cortex and medication-resistant auditory hallucinations. *Archives of General Psychiatry*, 60, 49-56.

Hollon, S.D., Thase, M.E., and Markowitz, J.C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest*, 3, 39-77.

Howatch, S. (1987). *Glittering images*. New York: Ballantine Books.

Howatch, S. (1988). *Glamorous powers*. New York: Ballantine Books.

Howatch, S. (1989). *Ultimate prizes*. New York: Ballantine Books.

Howatch, S. (1990). *Scandalous risks*. New York: Ballantine Books.

Howatch, S. (1992). *Mystical paths*. New York: Ballantine Books.

Howatch, S. (1994). *Absolute truths*. New York: Ballantine Books.

Hunt, H.T. (2007). "Dark nights of the soul": Phenomenology and neurocognition of spiritual suffering in mysticism and psychosis. *Review of General Psychology*, 11(3), 209-234.

James, W. (1902/1958). *The varieties of religious experience*. New York: Mentor Books.

Keller, M.B., McCullough, J.P., Klein, D.N., Arnou, B., Dunner, D. L., Gelenberg, A.J., Markowitz, J.C., Nemeroff, C.B., Russell, J.M., Thase, M.E., Trivedi, M.H., & Zajecka, J. (2000). A comparison of nefazodone, the cognitive behavioral-analysis system of psychotherapy, and their combination for the treatment of chronic depression. *New England Journal of Medicine*, 342(20), 1462-1470.

Kreiselmaier, L.R. (2012). Transliminality and transcendence: A two-dimensional model for conceptualizing creativity, mystical experience, and psychosis: Contributions and clinical implications. Unpublished paper for Psychology minor, Prof. Sohee Park. Nashville: Vanderbilt University. Available from the author (email: laura.r.kreiselmaier@vanderbilt.edu).

Lambe, E.K. & George, T.P. (2009). Translational studies on glutamate and dopamine neurocircuitry in addictions: Implications for addiction treatment.

- Neuropsychopharmacology*, 34, 255-256.
- 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.
- Lukoff, D., Lu, F., & Turner, R. (1998). From spiritual emergency to spiritual problem: the transpersonal roots of the new DSM-IV category. *Journal of Humanistic Psychology*, 38(2), 21-50.
- Malakmohammadi, M., Elias, W.J., & Pouratian, N. (2014, 9 Jan.). Human thalamus regulates cortical activity via spatially specific and structurally constrained phase-amplitude coupling. *Cerebral Cortex*, 24(1), 1-11.
- Matz, T. (1996). St. Teresa of Avila. Available from Catholic Online at http://www.catholic.org/saints/saint.php?saint_id=208, accessed 13 April 2014.
- Norberg, T. & Webber, R.D. (1998). *Stretch out your hand: Exploring healing prayer*. Nashville: Upper Room Books.
- O'Neal, N. (2003). The life of St. Ignatius of Loyola. Available from The New Orleans Province of the Society of Jesus online at <http://norprov.org/spirituality/lifeofignatius.htm#>, accessed 13 April 2014.
- Peters, E., Day, S., McKenna, J., & Orbach, G. (1999a). Delusional ideation in religious and psychotic populations. *British Journal of Clinical Psychology* 38(1), 83-96.
- Peters, E., Joseph, S.A., & Garety, P.A. (1999b). Measurement of delusional ideation in the normal population: Introducing the PDI (Peters et al. Delusions Inventory). *Schizophrenia Bulletin*, 25(3), 553-576.
- Phillips, P.R. (2010). Obituary: Michael A. Thalbourne 1955-2010. *Journal of Sacred Spaces: The E-Journal of the American Association of Pastoral Counselors*, 2015, vol.7

- Parapsychology*, 74(2), 383-386.
- Ridderinkhof, K.R., Nieuwenhuis, S., & Braver, T.S. (2007). Medial frontal cortex function: Introduction and overview. *Cognitive, Affective, and Behavioural Neuroscience*, 7(4), 261-265.
- Roberge, P.F. (2013, 17 Sept.). Hildegard von Bingen (1098-1179) - A discography. Available from the author online at <http://www.medieval.org/emfaq/composers/hildegard.html>, accessed 14 April 2014.
- Rubenstein, M. (2000). Well vs. equal temperament. Available online at <http://www.math.uwaterloo.ca/~mrubinst/tuning/tuning.html>, accessed 11 April 2014.
- Scroggie, J. (2014). Meeting for the Advanced Psychodynamic Psychotherapy training program of the Nashville (TN) Psychoanalytic Study Group.
- Stough, C., Donaldson, C., Scarlata, B., & Ciorciari, J. (2001). Psychophysiological correlates of the NEO PI-R openness, agreeableness, and conscientiousness. *International Journal of Psychophysiology*, 41, 87-91.
- Thalbourne, M.A. (2005). My career in parapsychology. Available from the Parapsychology Foundation Lyceum online at <http://www.pflyceum.org/129.html>, accessed 12 April 2014.
- Thalbourne, M.A. (2010). The Australian Sheep-Goat Scale: Development and empirical findings. *Australian Journal of Parapsychology*, 10(1), 5-39.
- Thalbourne, M.A., & Delin, P. (1994). A common thread underlying belief in the paranormal, creative personality, mystical experience and psychopathology. *Journal of Parapsychology*, 58, 17-37.
- Thalbourne, M.A., & Houran, J. (2000). Transliminality, the Mental Experience Inventory and Sacred Spaces: The E-Journal of the American Association of Pastoral Counselors, 2015, vol.7

tolerance of ambiguity. *Personality and Individual Differences*, 28, 853-863.

Thalbourne, M.A., & Storm, L. (2010). Transliminality: A bibliography 1991-2010. *Australian Journal of Parapsychology*, 10(2), 194-208.

Treatment for Adolescents with Depression Study (TADS) Team. (2004). Fluoxetine, cognitive-behavioral therapy, and their combination for adolescents with depression: Treatment for Adolescents with Depression Study (TADS) randomized controlled trial. *JAMA* **292**(7), 807-820.

Turner, V.W. (1969). *The ritual process: Structure and anti-structure*. Ithaca: Cornell University Press.

“Unequal temperament.” (1913). *Webster’s revised unabridged dictionary*. Springfield, MA: C. & G. Merriam Co. Available online at <http://onlinedictionary.datasegment.com/word/unequal+temperament>, accessed 11 April 2014.

Zentner, M., & Shiner, R.L. (Eds.). (2012). Preface to *Handbook of temperament*. New York: Guilford Press.