

**Ego-Alien Intrusions in the Context of
Mental Boundaries and Hemispheric Specialization**

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Running Head: APPARITIONS AND THE BRAIN

ABSTRACT

The homologue of left hemispheric (language) processes in the right hemisphere may be the primary neurological basis for ego-alien intrusions. Thus, perceptions of apparitions should typically be located to the left of the experient's body. We tested this prediction in a convenience sample of 268 participants who completed a measure of ego-alien intrusions, the Transliminality Scale, the Boundary Questionnaire, the Revised Paranormal Belief Scale, and a handedness scale. Results revealed that ego-alien intrusions involve psychological material crossing thresholds into conscious awareness, but that this process is not significantly related to interhemispheric connectedness. Ego-alien intrusions also showed no preference of body side. Accordingly, we found no support for the hypothesis that apparitions are the awareness of the right hemispheric homologue of the sense of self. Instead, the confluence of significant relationships between apparitions, thin boundaries in the mind, and paranormal beliefs associated with interpersonal control suggest that apparitions may be the byproducts of synesthetic-like processing of cognitive and emotional material. We expect that this process involves an integration among primary and secondary sensory areas and/or sensory association cortices and frontal-cortical loops as opposed to enhanced interconnectedness between the hemispheres of the brain or a larger midsagittal area of the corpus callosum in those with greater bilaterality.

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Apparition, from the Latin apparere (to appear), is an anomalous perception or appearance that does not refer to any obvious, natural objective cause, and may be perceived in any sensory mode. Many cultural traditions refer to these perceptions as “ghosts,” whereas the social and medical sciences speak of “ego-alien intrusions.” During the nineteenth century, Gurney, Myers, and Podmore [1] differentiated classes of apparitions and implied different mechanisms. Consequently, alongside parapsychological discussions of these experiences are attempts to naturalize them in the context of neurological and psychiatric thought [2, 3]. According to Persinger [4], most accounts of apparitions are post-mortem or bereavement experiences [5]. They are usually reported within about three days of the death of a person known to the experient. Notwithstanding that many medical and physical conditions are conducive for ego-alien experiences [6], conceptualizing apparitions as pathological is neither consistent with their phenomenology [7,8] nor with their prevalence in general populations world-wide [9, 10].

A different view is that the perception of apparitions is another phenomenon within the normal range of dissociative experience [11]. More specifically, one hypothesis [12, 13] proposes that experiences of apparitions are the awareness of the right hemispheric homologue of the sense of self. The sense of self would be generated by traditional left hemispheric, primarily linguistic, processes. According to the hypothesis of vectorial hemispheric function [12], stimuli that promote the intrusion of this right hemispheric equivalent into left hemispheric awareness increase the probability of the experience.

Accordingly, Cook and Persinger [14, p. 447] reported “...stimulation of the right temporoparietal region with frequency-modulated, weak (1 microT) magnetic field results in a reliable sensed presence in about 50% of randomly selected volunteers (about 12% respond in a sham field when sitting in the dark, quiet room).” Many laboratory validations of Persinger’s hypothesis have been published [e.g., 15, 16], but it is unclear how well these results generalize to spontaneous experiences of ego-alien intrusions—such as apparitions which are clearly linked to experiences of sensed presences [16, 17]. For example, Persinger’s hypothesis predicts that ego-alien intrusions would typically be perceived to the left of the experient’s body. However, this does not seem to be the case in general [18, 19] or in our recent case study of a woman who reported repeated encounters with “sentient beings” [20].

This discrepancy might be explained in terms of the construct of transliminality, which has most recently been defined as “a hypothesized tendency for psychological material to cross thresholds into or out of consciousness” [21, p. 861]. This material includes imagery, ideation, affect, and perception. As such, it is a consciousness variable relevant to transactions between the subliminal and supraliminal regions (psychological material reaching a threshold level in the former before attaining representation in the latter), and between ordinary consciousness and the outside world, as in normal perception, hyperaesthesia, and synesthesia. For instance, Thalbourne and Houran [21] found that highly transliminal persons tend to report more paranormal belief and experience (and specifically apparitions: 22, 23), a greater sense of being “high”, more daydreaming and fantasizing, a greater sense of mental potency, more introspection, and more altered consciousness.

Drawing on mechanisms hypothesized to underlie schizotypy and schizophrenia-like experience, we [24] outlined a biopsychosocial model for transliminality that emphasized interconnectedness between temporal-limbic structures and sensory association cortices.

Bilaterality might also contribute to transliminality [20], and it follows from this idea that transliminal experiences— including an aggregate property of language processes taking place primarily in the right hemisphere— would be more frequent in females, sinistrals, and mixed-handers. Consequently, Persinger's prediction of a relationship between ego-alien intrusions and body-side may only apply to these groups given Levy's [25, 26] theory that females and sinistrals have developed a “verbal blueprint” which allows their linguistic skills to be represented to a greater degree bilaterally. This idea has not been tested, although we located one case study of a left-handed woman who reported intense, nightly “sensed presences” that were perceived along the left side of her body [27].

Therefore, we tested the general hypothesis that ego-alien intrusions correlate with transliminality (Hypothesis 1), as well as investigated four other hypotheses concerning the relationships between transliminality, apparitions, and bilaterality. In particular, we predicted that left-handed and mixed-handed women, as compared to a group of right-handed men, will report significantly more ego-alien intrusions (Hypothesis 2); a significant trend for ego-alien intrusions to occur on the left-side of the body (Hypothesis 3); and significantly higher scores on transliminality (Hypothesis 4). As an additional measure of integration among cognitive and emotional processes, we administered Hartmann's [28] Boundary Questionnaire. Hartmann and his colleagues [29, p. 32] described the Boundary Questionnaire as “...an instrument developed to measure personality differences in boundary structure; the concept of thick and thin boundaries involves the degree of separateness (thick boundaries) versus connection (thin boundaries) between a broad range of mental functions, processes, and entities...” The Boundary Questionnaire has been previously linked to tendencies toward mixed-handedness [30], and we expect similar findings with transliminality since the two measures and constructs are close parallels.

Lastly, based on earlier findings [23], we expected that (Hypothesis 5) experiences of apparitions, as well as scores on the Transliminality Scale and the Boundary Questionnaire would correlate significantly higher with paranormal beliefs that reflect psychological need and control over interpersonal events (New Age Philosophy) as opposed to paranormal beliefs associated with maintaining social control (Traditional Paranormal Beliefs).

Method

Participants. Participants were comprised a convenience sample of 268 people ($M_{age} = 24.9$; $SD = 10.4$; range = 17-72 yrs.; 72% women). The majority of participants were from the general community, whereas approximately one-third of the participants were students from a community college who received extra credit for their participation.

Materials and Procedure. The data derive from a larger study that involved a battery of tests randomly ordered in packets. Among these were five instruments pertinent to our hypotheses: (a). The Rasch version of Thalbourne's 29-item Transliminality Scale [31], (b). The 136-item Boundary Questionnaire [28] which includes a total score and twelve subscales (Sleep/Wake/Dream, Unusual Experiences, Thoughts/Feelings/Moods, Childhood/Adolescence/Adulthood, Interpersonal, Sensitivity, Neat/Exact/Precise, Edges/Lines/Clothing, Opinions about Children/Others, Opinions about Organizations/Relationships, Opinions about Peoples/Nations/Groups, and Opinions about Beauty/Truth), (c). An Index of Ego-Alien Intrusions consisting of eleven items from the Anomalous Experiences Inventory [32] that deal with ego-alien intrusions such as perceptions of ghosts, the dead, "little people," feeling possessed by an external force, and out-of-body experiences [cf. 33, p. 323], (d). Lange, Irwin, and Houran's [34] two factor

(New Age Philosophy and Traditional Paranormal Beliefs) Rasch version of Tobacyk's Revised Paranormal Belief Scale, and (e). The 12-item Briggs-Nebes [35] Handedness Scale.

Results

Preliminaries. Approximately 46% ($N = 114$) of the sample reported experiencing an apparition. Upon reflection, this is an enormously high rate, even for a self-selected sample like ours. However, this percentage compares favorably to other studies [e.g., 22, 36, 37] and reinforces that these experiences are remarkably common [9, 10].

Out of a possible score of 11 on our measure of different varieties of apparitional experiences, we observed a range of only 0 to 5. Of those reporting experiences, the frequency distribution was: one experience ($N = 68$), two different experiences ($N = 18$), three different experiences ($N = 15$), four different experiences ($N = 8$), and five different experiences ($N = 5$).

Table 1 gives the descriptive statistics (mean and standard deviation) on the independent variables. Again, despite the self-selected nature of our sample, the participants scored within the average ranges for the Transliminality Scale [31], the Boundary Questionnaire [29], and New Age Philosophy and Traditional Paranormal Beliefs [34]. In addition, participants on average scored well within the range for right-handedness given by Briggs and Nebes [35].

[Table 1 about here]

Apparitions and Transliminality. In support of Hypothesis 1, scores on the measure of ego-alien intrusions correlated .38 ($p < .001$, one-tailed) with scores on the Transliminality Scale

and .28 ($p < .001$, one-tailed) with total scores on the Boundary Questionnaire. It was of interest to us to determine which of the twelve subscales of the Boundary Questionnaire best predicted apparitions. For this purpose we performed a multiple regression, using a forward selection method. The twelve subscales were tested for entry into the regression equation and four actually entered it: Category 2 (Unusual Experiences) ($\beta = .22$), Category 6 (Sensitivity) ($\beta = .15$), Category 9 (Opinions about Children/Others) ($\beta = -.19$), and Category 11 (Opinions about Peoples/Nations/Groups) ($\beta = .16$). The multiple regression coefficient R was .36 ($R^2 = .13$, i.e., 13% of the variance was accounted for by the combination of the four variables) and significant ($F(4, 248) = 9.39$, $p < .001$).

Apparitions and Hemispheric Specialization. As reported by others [18, 19, 20], we found that the ego-alien intrusions within our total sample of experiencers tended not to occur to the left of the body. Of the 114 participants reporting apparitions, 97 indicated that their experience showed no preference for body side (i.e., occurred in front of the body or involved both sides of their body). Eight participants reported experiences that favored the right side of their body, while nine participants reported experiences that favored the left side. Interestingly, there was a slight trend for those reporting experiences on the left side of their body to score higher on the Transliminality Scale ($M = 26$, $SD = 3.69$) and the Boundary Questionnaire ($M = 286$, $SD = 55.75$) than the other two groups combined (i.e., experiences on the right side of the body or no preference) (Transliminality: $M = 25.26$, $SD = 3.71$; Boundary Questionnaire: $M = 267.58$, $SD = 49.97$). However, an ANOVA (values not reported) indicated that these differences were not statistically significant.

To test Hypothesis 2 we combined all of the left-handed and mixed-handed women into one group ($N = 30$) and compared their scores on ego-alien intrusions to scores from a

second group composed of the right-handed men ($N = 61$). Again, an ANOVA revealed that the left-handed and mixed-handed women scored higher on reports of ego-alien intrusions ($M = .73$, $SD = 1.26$) than the comparison group ($M = .67$, $SD = 1.14$), but this difference was not statistically significant.

With respect to Hypotheses 3, we examined the correlation between test group (right-handed men = 1, left and mixed-handed women = 2) and body side (left side of body = -1, no preference in body side = 1). Contrary to expectations, the ego-alien intrusions of the left-handed and mixed handed women did not show a preference for the left side of the body ($\rho = .30$, $p = .08$, $N = 36$, two-tailed). Lastly, we compared the mean scores on the Transliminality Scale and Boundary Questionnaire (total score and score on twelve subscales) via an ANOVA for the combined group of left-handed and mixed-handed women versus the combined group of right-handed men. There were significant differences between the two groups only with Categories 3 (Thoughts/Feelings/Moods) and 5 (Interpersonal) of the Boundary Questionnaire. Consistent with Hypothesis 3, the left and mixed-handed women ($M = 27.17$, $SD = 5.48$) scored significantly ($F(1, 87) = 5.23$, $p < .03$) lower on Category 3 than the right-handed men ($M = 30.52$, $SD = 7.02$). In contrast to Hypothesis 3, the right-handed men ($M = 22.51$, $SD = 7.02$) scored significantly ($F(1, 87) = 7.14$, $p < .01$) higher on Category 5 than the left and mixed-handed women ($M = 25.73$, $SD = 4.81$). Thus, bilaterality was associated with “thinner boundaries” concerning Thoughts/Feelings/Moods, whereas greater hemispheric specialization was associated with “thinner boundaries” concerning the appraisal of Interpersonal domains.

Apparitions and Paranormal Belief. New Age Philosophy correlated .58 ($p < .001$) with Traditional Beliefs. Thus, the two factors only have about 34% of shared variance, and

accordingly they are measuring slightly different types of paranormal belief (for a discussion see: 39). Consistent with Hypothesis 5 and partially replicating Houran and Thalbourne [23], Table 2 shows that Transliminality, the Boundary Questionnaire, and ego-alien intrusions all correlated higher with a New Age Philosophy than with Traditional Paranormal Beliefs. However, only the differences in Transliminality and the Boundary Questionnaire between the two types of paranormal belief were statistically significant.

[Table 2 about here]

Discussion

Like previous research [18, 19, 20], our analyses did not confirm that ego-alien intrusions tend to occur to the left of experient's bodies, even in a sample of individuals with theoretically greater bilaterality. This finding is contrary to Persinger's [12, 13] hypothesis that ego-alien intrusions represent the awareness of the right hemispheric homologue of the sense of self. Additional analyses on our dataset to be reported in a separate paper also did not confirm Hicks et al.'s [30] finding that handedness is generally linked to the construct of mental boundaries (measured either by the Transliminality Scale or the Boundary Questionnaire). This coincides with the null results of our repeated comparisons between a group of left and mixed-handed women and right-handed men. The only significant effect of bilaterality in the predicted direction concerned Thoughts/Feelings/ Moods. By contrast, we observed thinner boundaries for right-handed men with respect to Interpersonal domains. This effect is less surprising given that the items from the Interpersonal subscale can be interpreted as cognitive or analytical appraisals of interpersonal interactions and their subsequent outcomes.

Our findings are not consistent with an interhemispheric source for the ego-alien intrusions reported by our participants¹, but the findings do suggest that these experiences are in part a mixture of psychophysiology and psychodynamics. In particular, we replicated our previous study [23] that linked apparitions to both a New Age Philosophy (i.e., paranormal beliefs reflecting psychological need and interpersonal control), as well as to higher levels of transliminality. The use of the Boundary Questionnaire provided convergent evidence for these conclusions as the domains that significantly predicted apparitions involved empathic reactions toward others and a heightened sensitivity to environmental stimuli.

We conclude that ego-alien intrusions are complex transliminal phenomena that—probably similar to other transliminal experiences—derive more from an integration among primary and secondary sensory areas and/or sensory association cortices and frontal-cortical loops than they do from right-hemispheric phenomena or to a possibly larger midsagittal area of the corpus callosum in those with greater bilaterality [41]. This leads us to speculate that ego-alien intrusions are byproducts of the synesthetic-like processing of cognitions and emotions that derive from regions across thresholds and the characteristics of the physical setting in which the experience occurs [42]. This proposal is not unlike the ideas of early and contemporary parapsychologists [43, 44], and anthropologists Ember and Ember [45] envisioned a similar process:

There are many cues in everyday experience that are associated with a loved one, and even after...death those cues might arouse the feeling that the dead

¹ This is consistent with other studies that suggest schizophrenic or schizophrenia-like cognitions depend on the balance between activities of the right and left hemispheres [e.g., 39, 40].

person is still somehow present. The opening of a door, the smell of tobacco or cologne in a room, may evoke the idea that the person is still present, if only for a moment. Then, too, loved ones live on in dreams. Small wonder, then, that most societies believe in ghosts. If the idea of ghosts is generated by these familiar associations, we might expect that ghosts in most societies would be close relatives and friends, not strangers — and they are (p.420).

Early writers in the field of abnormal psychology readily explained apparitions as such manifestations of the psyche [46]. In a 1919 address to the Society for Psychical Research (SPR), Carl G. Jung likewise conceived of apparitions as exteriorized, i.e., psychologically projected, unconscious complexes. But, Jung later changed his view. When Jung's address to the SPR was re-published in an anthology almost forty years later (1957), he expressed doubt about the veracity of an exclusively psychological model of apparitions [47]. We agree with Jung and other informed researchers (for a review see: 7) on the point that experiences of apparitions are probably multivariate in nature, notwithstanding a possible fundamental pathophysiology that might be stimulated via myriad states of arousal [42]. The notion of a parapsychological component to these experiences remains a controversial hypothesis, but we certainly encourage research in this regard. Regardless, research on ego-alien intrusions from either parapsychological or neurological perspectives will likely reveal important insights into the complex workings of imagination, cognition, and personality. It could well be that Persinger has only identified a neurological correlate for the "sensed presence," whereas traditional apparitions may be more complex phenomena facilitated by separate, though as-of-yet unidentified mechanisms. Continued and more detailed studies distinguishing both types of experiences are therefore justified.

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Table 1. Descriptive Statistics on Research Measures for the Complete Sample ($N = 268$)

	<u>M</u>	<u>SD</u>
Transliminality Scale	23.80	4.30
Boundary Questionnaire--Total	258.15	48.10
Boundary Questionnaire Subscales		
Category 1: Sleep/Wake/Dream	17.42	10.09
Category 2: Unusual Experiences	23.75	10.55
Category 3: Thoughts/Feelings/Moods	27.70	8.16
Category 4: Childhood/Adolescence/Adulthood	9.84	3.94
Category 5: Interpersonal	23.80	5.71
Category 6: Sensitivity	11.37	3.85
Category 7: Neat/Exact/Precise	19.93	7.05
Category 8: Edges/Lines/Clothing	35.78	8.11
Category 9: Opinions about Children/Others	19.90	4.54
Category 10: Opinions about Organizations/Relationships	21.07	5.34
Category 11: Opinions about Peoples/Nations/Groups	30.98	6.88
Category 12: Opinions about Beauty/Truth	16.39	3.77
New Age Philosophy	24.94	12.87
Traditional Paranormal Beliefs	17.42	6.37
Ego-Alien Intrusions	.77	1.18
Handedness	13.95	12.64

Table 2. Spearman Correlations Between Transliminality, Boundary Questionnaire, and Apparitions and Paranormal Belief (New Age Philosophy vs. Traditional Beliefs) ($N = 268$).

	<u>New Age Philosophy</u>	<u>Traditional Paranormal Beliefs</u>	<u>t</u> (265)	<u>p</u> (diff between columns)
Transliminality	.46*	.26*	2.29	.05
Boundary Questionnaire	.29*	.09	5.18	.001
Ego-Alien Intrusions	.45*	.37*	1.16	ns

* $p < .001$