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Patterns of Occurrence of Four States of Consciousness as a Function of Trait Absorption

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Abstract

Four states of consciousness are considered here: the hypnagogic state (the transitional state between waking and sleeping); the hypnopompic state (the transitional state between sleeping and waking); lucid dreaming (insight to the fact that one is currently dreaming); and the out-of-the-body experience (perceiving the world from a location outside the physical body). There are different patterns of occurrence of experience with these states of consciousness, and the present data set deriving from a cross-sectional study (a convenience sample comprising 251 participants who had completed a battery of questionnaires, as reported in Glicksohn & Barrett, 2003), enables one to plot these configurations. There are two contrasting positions on the relationship that trait Absorption will bear on the pattern of occurrence of these different profiles of subjective experience, or configuration of profiles of states. One is that higher Absorption will entail more differentiation among these states of consciousness; the other is that higher Absorption will entail less differentiation among these states. Both positions find support in the present data set: higher Absorption entails more differentiation as one moves from those respondents scoring slightly lower than the median to those scoring slightly higher than the median on Absorption, whereas very high Absorption entails less differentiation relative to very low Absorption.

Keywords: hypnagogic; hypnopompic; lucid dreaming; OBE; absorption; differentiation

Introduction

The present-day study of states of consciousness seems to be somewhat similar to the study of traits of personality as conducted around thirty years ago. At that time, individual traits were viewed in isolation (e.g., Buss, 1989; Furnham, 1990). Since then, these traits have been viewed as comprising a profile (e.g., Banissy et al., 2013; Glicksohn & Bozna, 2000), and, more recently, interactions among the traits have been investigated (e.g., Glicksohn, Golan-Smooha, Naor-Ziv, Aluja, & Zuckerman, 2018; Merz & Roesch, 2011). States of consciousness, such as that of lucid dreaming (Saunders, Roe, Smith, & Clegg, 2016) and the out-of-the-body experience (OBE; Blanke, Faivre, & Dieguez, 2016) are now reviewed in isolation. That is to say, these states of consciousness are not viewed as comprising an intra-individual profile of states, as warranted in a person-oriented approach (Bergman, Vargha, & Kövi, 2017), and as will be advanced in this paper. This, however, does not detract from some recent papers looking at these states of consciousness in tandem (e.g., Carhart-Harris et al., 2014; Lemercier & Terhune, 2018; Millière et al., 2018). One focus of such reviews is to report on the prevalence of these states; another is to report on personality traits predisposing for such experiences. The next stage of study, which the present paper will promote, is to view these states in conjunction.

One focus here would be to report on the covariation of experience. For example, the current prevalence rate for lucid dreaming (insight to the fact that one is currently dreaming) is 55% (Saunders et al., 2016, p. 210), and for the OBE (perceiving the world from a location outside the physical body) supposedly only 5%, at least according to Blanke et al. (2016, p. 324). In the database reported here (Glicksohn & Barrett, 2003), the prevalence rate for lucid dreaming is 60%, while that for the OBE is 21%.

Note that neither this study (Glicksohn & Barrett, 2003) nor an earlier one reporting a prevalence rate of 59% for lucid dreaming (Glicksohn, 1989) were included in the meta-analysis recently reported by Saunders et al. (2016). Thus, the present prevalence rate closely matches that which Saunders et al. (2016) reported, based on the data of other studies in the literature. In other cultures, the prevalence rate may even be much higher (e.g., Mota-Rolim et al., 2013). In the Glicksohn (1989) paper, the prevalence rate for the OBE was also found to be 21%.[1] As to the covariation of lucid dreaming and OBE (i.e., the respondent experiencing both, though not necessarily conjointly or consecutively), which Levitan, LaBerge, DeGracia, and Zimbardo (1999, p. 190) reported was 38.5%, this was 16.2% in the Glicksohn and Barrett (2003) data.

In the present paper, the Glicksohn and Barrett (2003) database is reconsidered. In particular, there are four states of consciousness reported there, that should not be looked at in isolation. These are the hypnagogic state (the transitional state between waking and sleeping) and the hypnopompic state (the transitional state between sleeping and waking), in addition to lucid dreaming and the OBE. Ohayon, Priest, Caulet, and Guilleminault (1996) reported prevalence rates of 37% for the hypnagogic state, and 12.5% for the hypnopompic state, whereas Glicksohn and Barrett (2003) reported higher rates of prevalence: 78% for the hypnagogic state, and 48% for the hypnopompic state—these percentages matching quite well both previous estimates using the same questionnaire (Glicksohn, 1989), and a more recent study (Jones, Fernyhough, & Meads, 2009), reporting a prevalence rate of 85% for the experience of hypnagogic and hypnopompic states (not distinguished).[2] Not only is there covariation of experience of the OBE and lucid dreaming (Glicksohn, 1989; Glicksohn & Barrett, 2003; Levitan et al., 1999), there is also covariation of experience of the OBE and the hypnagogic state (Sherwood, 2012). Thus, a profile of states of consciousness can be posited: hypnagogic state, hypnopompic state, lucid dreaming, OBE.

One can both envisage transitions between these states (Tart, 2008) and consider the notion that the first three states are themselves considered to be transitional. As Voss and Hobson (2015, p. 9) have recently written, "lucid dreaming is … a fragile, destabilized hybrid state." Terhune (2009, p. 237) refers to the 'hypnagogic model' for OBE, namely the plausible transition from the hypnagogic state to the OBE. Similarly, Soffer-Dudek and Shahar (2009, p. 892) suggest that "out-of-body experiences may be viewed as possible manifestations of a hypnagogic or hypnopompic hallucination." Nevertheless, as Alvarado (2000, p. 202) has commented, "findings that specifically relate hypnagogic imagery to spontaneous OBEs have not been consistent." Glicksohn (1989), in contrast, proposed that the transition to the OBE might well be from the hypnopompic state. Lucid dreaming would lie on a continuum of such transitional, hallucinatory states (Hunt & Ogilvie, 1988; Lothane, 1982, p. 343).[3] Indeed, Laberge (2014, p. 147) has suggested that the OBE "…in some cases can be almost identical phenomenologically to lucid dreaming."

The trait of Absorption has been clearly linked to these states of consciousness in particular (e.g., Glicksohn, 2004; Glicksohn & Barrett, 2003; Hunt, 1989, 2007; Rosen et al., 2017; Terhune, 2009), and to states of consciousness in general (e.g., Aaronson, 1973; Crawford, Brown, & Moon, 1993; Lemercier & Terhune, 2018, p. 736; Millière et al., 2018; Mohr, 2018; Studerus, Gamma, Kometer, & Vollenweider, 2012). Hence, one can further posit that trait Absorption is a predisposing factor here for such experience.

If every picture tells a story, then what story does Figure 1 tell? Here are all 16 combinations (i.e., profiles) of these four states of consciousness, each state being categorized as 0 (no experience) or 1 (experience), as reported by the respondents in the Glicksohn and Barrett (2003) data set, and these are presented in an array. The number of respondents conforming to each profile is in itself revealing. For example, for profile 1000 (experience only of the hypnagogic state) there are 34 respondents, comprising 14% of the sample, while profile 1111 (experience of all 4 states of consciousness) pertains to 10% of the sample.

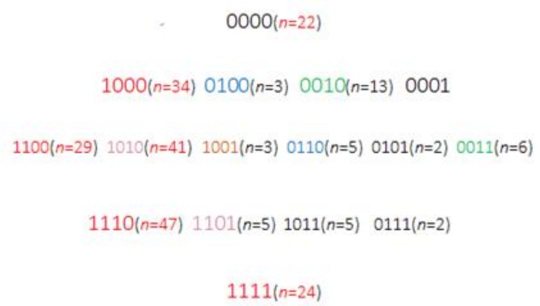

Figure 1. All 16 combinations of the four states of consciousness: The hypnagogic state, the hypnopompic state, lucid dreaming, and, and the out-of-the-body experience. Note that n = 241 due to 10 missing values.

What do we know about these different profiles, and does Absorption have any bearing for the pattern of occurrence of these different profiles?

Jayne Gackenbach (2006, 2008) has reported on a view expressed to her by Harry Hunt that

> the emergence of these attributes thought important to the transpersonal perspective might all correlate at lower levels, but at the higher levels break out as separate skills, experiences, or states of being... He argues that absorption or openness to experience are the central experience from

[1] In the Glicksohn (1989) paper, I wrote (p. 105): "The present estimate of 21% thus conforms to those of previous studies, and suggests that Blackmore [1983] may be underestimating the incidence of OBEs."

[2] Strictly speaking, in this paper I will be assessing the *experience* of hypnagogic and hypnopompic *imagery*, as a suitable proxy for the experience of these states of consciousness.

[3] How exactly one should take into consideration the *lucidity* of lucid dreaming in conjunction with such a *hallucinatory* continuum is a topic worthy of further attention.

> which experiences found to be connected to the development of consciousness emerge. In other words, correlations may be confusing, or simply lump together to some degree at the lower levels of consciousness development along any of these lines. They might only emerge as unique factors at the higher levels (Gackenbach. 2006, pp. 108- 109).

In full agreement with this view (Glicksohn, 2004), I shall be looking at the various profiles comprised of these four ‘value patterns’ (Bergman et al., 2017), investigating the pattern of occurrence of these different profiles. Note that Hunt’s developmental proposition is fully in line with a person-oriented approach.

Let me rephrase Hunt’s thoughts here in terms of Heinz Werner’s (1948, 1978) orthogenetic principle of development: One expects to see increasing differentiation, coupled with hierarchical integration, in the patterns of occurrence of these different profiles, as one moves up developmentally. Will higher Absorption entail more differentiation and more integration (Hunt’s view, I believe), or less differentiation and less integration (when high Absorption is viewed as a syncretic experience, indicated by the close relationship with synaesthesia; Glicksohn, Salinger, & Roychman, 1992; Roche & McConkey, 1990; Terhune, 2009)? One could argue either way, depending on one’s interpretation of Absorption, and especially given the notion that individuals scoring high on Absorption can appreciate more complexity in what those scoring low on Absorption might view as boring and monotonous; Glicksohn, Tsur, & Goodblatt, 1991). The data I will present will hopefully be informative here.

Thus, the goals of this paper are two: First, to present the pattern of occurrence of the different profiles of experience of the four states of consciousness (the hypnagogic state, the hypnopompic state, lucid dreaming, and the OBE); second, to investigate how trait Absorption bears on these different configurations of profiles. To this end, I will employ person-oriented, data-analytic tools.

Method

Participants and Procedure

A convenience sample comprising 251 participants completed a battery of questionnaires (Glicksohn & Barrett, 2003), appearing in various orders, which included (for present purposes) both an assessment of trait Absorption and a survey concerning the incidence of the four target states of consciousness. Of these, a total of 241 provided us with complete data. As indicated in the original paper (Glicksohn & Barrett, 2003), these participants comprised students studying with me in research seminars, who were asked both to complete and to administer this battery of questionnaires to family members, friends, associates and neighbours, with as wide a background as possible, coming from all walks of life, of varying age, and of varying cultural background. The 241 participants whose data are analyzed in this paper comprise 135 females and 94 males (12 did not identify), and their age ranged between 13 and 78 (M = 30.1, SD = 11.3 years).

Measures

The Tellegen Absorption Scale (34 items in a true/false format, taken from the Multidimensional Personality Questionnaire; Tellegen, 1982) assesses an openness to experience cognitive-affective alterations in a variety of situations (Roche & McConkey, 1990). Reliability of the Hebrew version of the scale (alpha) was found to be 0.84 (Glicksohn & Barrett, 2003).

The Subjective Experience Questionnaire (Glicksohn, 1989) assesses the frequency of incidence of various types of subjective experience along the sleep–wakefulness continuum. These include the following: the hypnagogic state (“When you are on the verge of sleep, do you experience imagery?”); the hypnopompic state (“Do you experience imagery when you’re just beginning to awake?”); lucid dreaming (“Have you ever, while in a dream, been aware of the fact that it was a dream?”)[4]; and the out-of-the-body experience (OBE; “Have you ever had the experience of feeling that you were located outside your physical body, that is to say, a feeling that your consciousness was at a different place than your physical body?”). Participants responded to each experience using a 5-point rating scale (1—never; 2—very seldom; 3—occasionally; 4—fairly often; 5—frequently). For profile analysis, these values were then recoded as 0 (1 or 2), indicating practically no familiarity; and 1 (3, 4, or 5), indicating a report of the experience. Prevalence rates are as follows: The hypnagogic state (78%), the hypnopompic state (48%), lucid dreaming (60%) and OBE (21%), as reported previously (Glicksohn & Barrett, 2003, p. 841).

Results

Profile analysis

For profile analysis, each of these four subjective experiences was recoded as a binary variable, indicating a report (or not) of the experience. Figure 2 presents the pattern of occurrence of the different profiles, subsequently split by the respondent’s score on the TAS: those scoring ≤ 13 (Figure 2a, n = 68); those scoring more than 13 and ≤ 20 (Figure 2b, n = 66); those scoring more than 20 and < 28 (Figure 2c, n = 91); and those scoring ≥ 28 (Figure 2d, n = 16). For both this analysis and the subsequent cluster analysis, n = 241, due to 10 missing values.

[4] In the past, and especially at the time that the Glicksohn (1989) paper was published, arguments were raised as to whether this was a sufficient criterion for defining lucid dreaming. Voss and Hobson (2015, p. 5) have recently stressed that this is, what they view to be, the “core criterion for lucidity”.

At a low level of trait Absorption (Fig. 2a), a total of *n* = 12 profiles appear in the data. For these respondents scoring low on Absorption, the experience of the hypnagogic state and/or the state of lucid dreaming seems to be their major states of consciousness.

0000(*n*=10)

1000(*n*=7) 0100(*n*=1) 0010(*n*=8) 0001

1100(*n*=9) 1010(*n*=8) 1001(*n*=1) 0110(*n*=4) 0101 0011(*n*=1)

1110(*n*=14) 1101(*n*=1) 1011 0111

1111(*n*=4)

Figure 2a. The configuration of profiles for respondents scoring ≤ 13 on Absorption (n = 68).

0000(*n*=7)

1000(*n*=15) 0100(*n*=1) 0010(*n*=4) 0001

1100(*n*=8) 1010(*n*=13) 1001 0110 0101 0011(*n*=2)

1110(*n*=10) 1101(*n*=2) 1011(*n*=1) 0111

1111(*n*=3)

Figure 2b. The configuration of profiles for respondents scoring 13 < TAS ≤ 20 on Absorption (n = 66).

0000(*n*=5)

1000(*n*=11) 0100(*n*=1) 0010(*n*=1) 0001

1100(*n*=10) 1010(*n*=20) 1001(*n*=2) 0110(*n*=1) 0101(*n* =2) 0011(*n*=1)

1110(*n*=21) 1101(*n*=1) 1011(*n*=4) 0111(*n*=1)

1111(*n*=10)

Figure 2c. The configuration of profiles for respondents scoring 20 < TAS < 28 on Absorption (n = 91).

Configural frequency analysis (CFA) can be employed here to see whether any particular profile stands out, indicating either higher or fewer counts of individuals, relative to "some base model" (von Eye & Gutiérrez Peña, 2004, p.

0000

1000(*n*=1) 0100 0010 0001

1100(*n*=2) 1010 1001 0110 0101 0011(*n*=2)

1110(*n*=2) 1101(*n*=1) 1011 0111(*n*=1)

1111(*n*=7)

Figure 2d. The configuration of profiles for respondents scoring TAS ≥ 28 on Absorption (n = 16).

981). Higher-than-expected counts are viewed as types, whereas lower-than-expected counts are viewed as anti-types (von Eye & Bogat, 2006, p. 393). CFA was conducted using ROPstat (Vargha, Torma, & Bergman, 2015). For the data presented in Figure 2a, no particular profile stands out, when correcting alpha values for multiple profiles. Without such correction, profiles 0000 and 1111 would stand out as having a higher than expected frequency count (each at $p < .05$).

Respondents scoring slightly lower than the median score on the TAS (Figure 2b) exhibit 11 distinct profiles. Hence, for these respondents there seems to be less differentiation, relative to those scoring low on Absorption. For the data presented in Figure 2b, no particular profile stands out, either with or without alpha correction.

Turning to the respondents scoring slightly higher than the median score on the TAS (Figure 2c), one notes 15 different profiles. Hence, there is much higher differentiation with increasing level of Absorption. For the data presented in Figure 2c, no particular profile stands out, when correcting alpha values for multiple profiles. Without such correction, profile 0000 would stand out as having a higher than expected frequency count (at $p < .05$).

Respondents scoring high on the TAS (Figure 2d) present much less differentiation, exhibiting only 7 different profiles, though one has to consider the fact that their number ($n = 16$) is a limiting factor here. For their data, no particular profile stands out, when correcting alpha values for multiple profiles. Without such correction, profile 0011 would stand out as having a higher than expected frequency count (at $p < .05$).

In juxtaposition then, one notes a pattern of high differentiation (Figure 2a), then relatively (to Figure 2a) slightly less differentiation (Figure 2b), then relatively (to both Figure 2a and Figure 2b) more differentiation (Figure 2c), and then markedly less differentiation (Figure 2d).

Cluster analysis

For cluster analysis, each of these 4 subjective experiences was viewed as a continuous variable indicating frequency of experience on a 5-point scale. Figure 3 presents the dendrogram obtained for the top 3 branches of the clustering solution found (using Stata), following the implementation of Ward's method (with the squared Euclidean distance being the distance measure between clusters). Each respondent was subsequently assigned to his or her respective cluster (group: G1 [n = 90], G2 [n = 116], or G3 [n = 35]).

The analysis was also conducted using ROPstat, which provides a wealth of indices for comparing clustering solutions. It is therefore convenient to compare the three-cluster solution presented by Stata with that provided by ROPstat, and also with both a two-cluster and a four-cluster solution. Table 1 provides some summary statistics. Note that in comparing the two three-cluster solutions, G1 remains practically the same in size, while G2 in the Stata solution is somewhat larger and G3 is somewhat smaller—and both to the same degree (n = 11 or 12). Given this minor discrepancy, which is quite reasonable (Bergman, 1998, p. 119; Vargha, Bergman, & Takács, 2016, p. 79), is the k = 3 solution the optimal one?

One criterion is that SC > .50 (Vargha et al., 2016, p. 82), but this is of little help in the present case. Clearly, none of these solutions approaches the EESS > .67 criterion (Malmberg & Little, 2007, p. 744) — that criterion is only realized for k = 8. For k = 4, EESS first achieves the 50% mark, which is another criterion to consider (Viborg, Wångby-Lundh, Lundh, Wallin, & Johnsson, 2018, p. 4). In addition, for k = 4, HC < 1 (Malmberg & Little, 2007, p. 744; Vargha et al., 2016, p. 81) — all of which support a k = 4 solution. And yet, a k = 3 solution will be adopted here (using respondent allocation to each cluster based on the Stata solution), and this for four reasons. First, as Bergman (1998, p. 98) stresses, the EESS criterion "is arbitrary"; second, as Bergman (1998, p. 98) suggests, "stopping when the point-biserial correlation coefficient attained its maximum value" is a fine criterion (see also Vargha et al., 2016, p. 81). Note in Table 1 that PBC has its maximal value at k = 3.

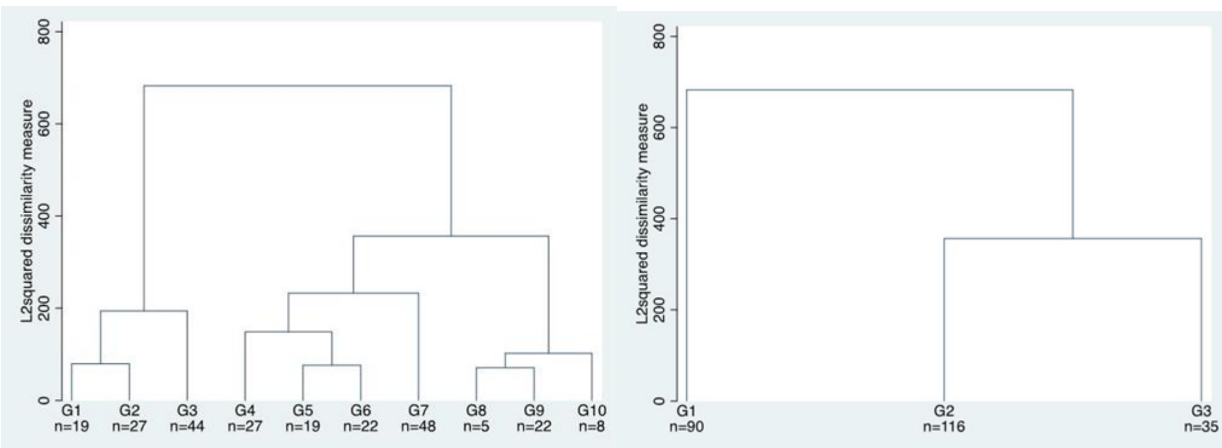

Figure 3. The dendrogram obtained for the top 3 branches of the clustering solution (right panel), as derived from a 10-branch solution (left panel), using Stata.

Table 1. *Comparison of two, three and four-cluster solutions, adopting Ward's method followed by k-clustering, using ROPstat.*

k	Point-biserial correlation (PBC)	Silhouette coefficient (SC)	Cluster homogeneity coefficient (HC), when variables are standardized	Explained Error Sum of Squares (EESS) expressed as a percentage
2	.37	.58	1.46	27.93
3: G1 = 89, G2 = 105, G3 = 47	.45	.57	1.16	41.32
4	.43	.58	0.99	50.45

Third, a comparison can be drawn between the values reported in Table 1 and those recently reported by Sirigatti, Penzo, Giannetti, Casale, and Stefanile (2016, Table 1). In that study, using ROPstat, using the same statistics, and comparing solutions for $k = 2$, 3, and 4, the authors reported on EESS values all under .50; on SC values all ranging between .55 and .57; on HC values all in excess of 1.0; and a peak PBC value at $k = 3$ of .38. They write (p. 221): "All considered, the three-cluster solution, although far from being completely appropriate, was evaluated as the most suitable." That decision is also applicable here. Finally, the dendrogram clearly indicates that a $k = 3$ solution is feasible. Hence, that is the solution that is adopted here.

These three clusters were then compared at the level of the respondent's profile by means of a Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) analysis of variance (ANOVA), with repeated measures on the latter. In this analysis, Group [$F(2, 238) = 243.3$, MSE = 0.79, $p < .0001$], State of Consciousness [$F(3, 714) = 146.3$, MSE = 0.94, $p < .0001$], and their interaction [$F(6, 714) = 23.8$, MSE = 0.94, $p < .0001$] have significant effects. Figure 4 presents these results; as can be clearly seen, frequency of experience of each state of consciousness generally decreases from that pertaining to the hypnagogic state through that pertaining to the OBE for G1 and G2.

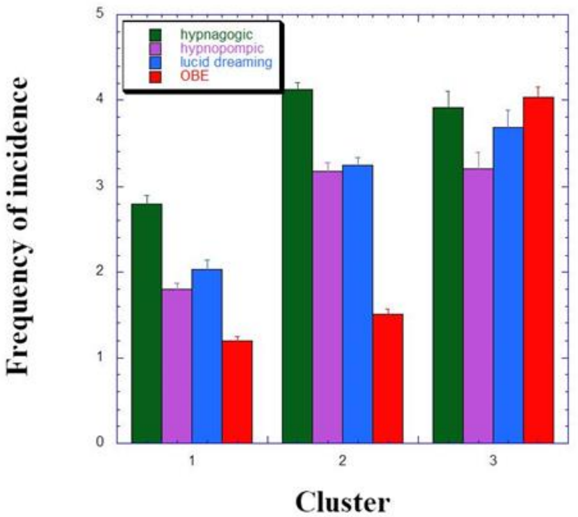

Figure 4. Means (+ SE) deriving from the Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) ANOVA.

One can further note that frequency of experience of each state of consciousness generally increases from G1 to G2 to G3. From the dendrogram appearing in Figure 3, G2 and G3 should be more similar than either of these with G1. Note from Figure 4 that this is, indeed, the case for the hypnagogic and hypnopompic states, and for lucid dreaming. In contrast, for the OBE, G1 and G2 are more similar. Do these three clusters differ in terms of trait Absorption? Indeed, they do [$F(2, 238) = 12.5$, MSE = 42.4, $p < .0001$], as can be readily seen in Figure 5.

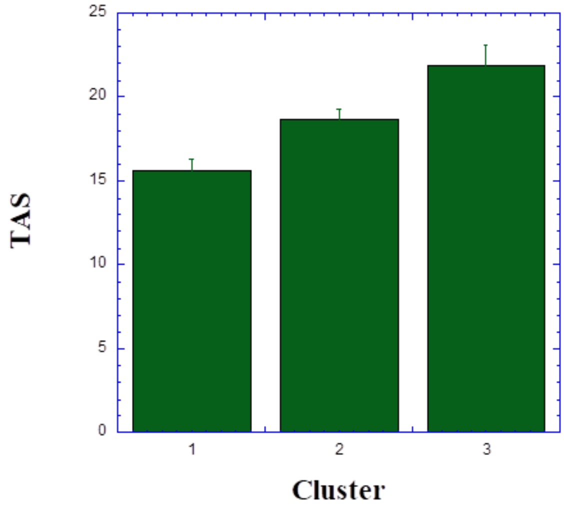

Figure 5. Means (+ SE) for trait Absorption (TAS score) for each Cluster (G1, G2, G3).

On cross-tabulating the two grouping variables, one based on the 4 groups defined above for the TAS scores, the other based on the 3 groups defined by the cluster analysis, it was found that of the 16 participants scoring ≥ 28 on the TAS, a total of 9 were affiliated with cluster G3. Given that the remaining 7 participants from this high TAS group were spread thinly over G1 and G2, a three-way ANOVA employing the TAS grouping could not be implemented. Instead of this, the Cluster × State of Consciousness ANOVA presented above was rerun in separate for each TAS subgroup. In each case, the main effect for Cluster (with respective F-values of 61.79, 63.31, 66.20, and 10.18) was significant (each at $p < .005$); and the main effect for State of Consciousness (with respective F-values of 48.82, 49.56, 58.12) was significant (each at $p < .0001$) for each TAS subgroup, barring that scoring ≥ 28.

In short, in comparison with the Cluster × State of Consciousness data appearing in Figure 4, what now appears, and as presented in Figures 6a-d, can be summarized as follows: (1) For participants scoring ≤ 13 on the TAS, their data (as seen in Figure 6a) look very similar to the data presented in Figure 4; (2) this is also the case for participants scoring more than 13 and ≤ 20 on the TAS (Figure 6b) and for those scoring more than 20 and < 28 on the TAS (Figure 6c). That is to say, for participants scoring < 28 on the TAS, Figure 4 well portrays their data. For participants scoring ≥ 28 on the TAS, in contrast, their data present a different pattern, as can be readily seen in Figure 6d. The main change here in pattern is for G2 ($n = 6$): For them, there is a high incidence of both hypnagogic and hypnopompic imagery.

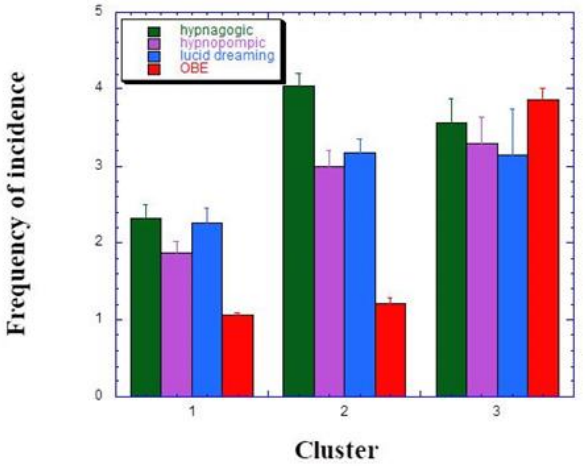

Figure 6a. Means (+ SE) deriving from the Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) ANOVA, for the TAS subgroup scoring ≤ 13 (n = 68).

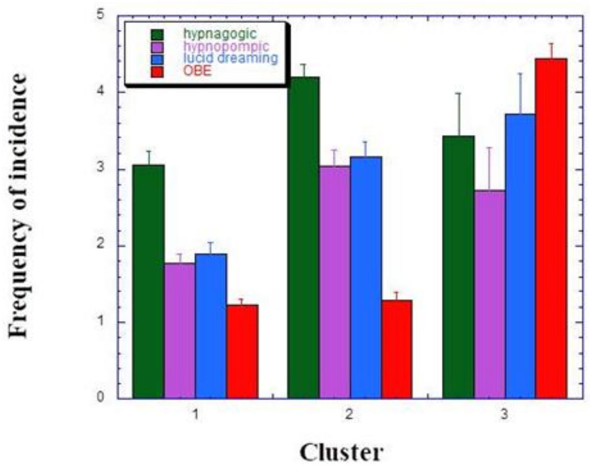

Figure 6b. Means (+ SE) deriving from the Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) ANOVA, for the TAS subgroup scoring >13 and ≤20 (n = 66).

Discussion

In considering the limitations of the present study, one must naturally turn to the question of how one should evaluate the three-group clustering solution (Bergman, 1998, pp. 95-96). Conceivably, this could be done with reference to the independent allocation of these same respondents to a total of four groups based on their TAS score. There are three supporting lines of evidence. First, the three clusters do differ in average TAS score. Second, the profiles obtained for three of the TAS groups, namely for all those respondents for whom TAS < 28, are quite similar, while that for high TAS (TAS ≥ 28) is distinct. Finally, the majority of respondents falling in that extreme group also belong to the third cluster. This, in turn, supports two major propositions: (1) Participants scoring very high on the TAS (TAS ≥ 28) are a unique group of individuals, as has been previously argued (Glicksohn et al., 1992); and (2) Absorption is a predisposing factor for the states of consciousness that comprise their profile of states, as has been previously demonstrated (Glicksohn & Barrett, 2003). A person-oriented approach to the individual's states of consciousness, having an interest in the configuration (Bergman, 1998, p. 85) of these profiles of states, can build on the present paper to make further progress in this somewhat neglected domain.

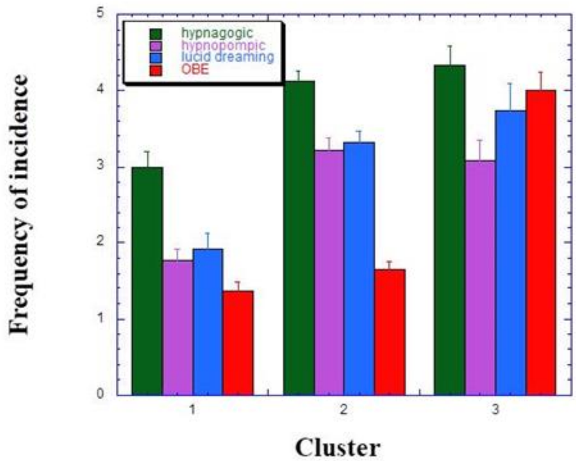

Figure 6c. Means (+ SE) deriving from the Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) ANOVA, for the TAS subgroup scoring >20 and <28 (n = 91).

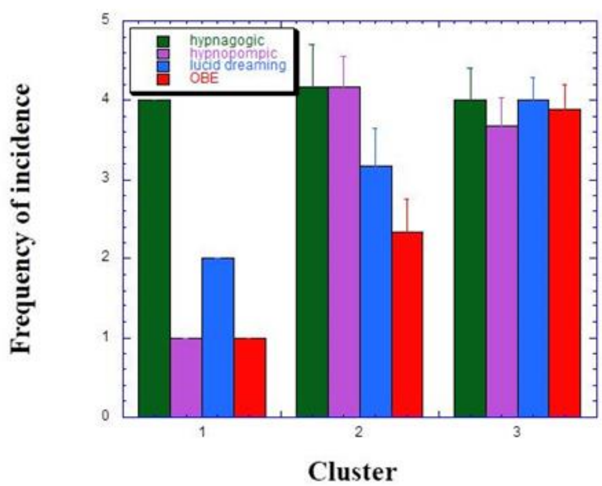

Figure 6d. Means (+ SE) deriving from the Cluster (G1, G2, G3) × State of Consciousness (hypnagogic state, hypnopompic state, lucid dreaming, OBE) ANOVA, for the TAS subgroup scoring ≥ 28 (n = 16).

It is with respect to this configuration of profiles of states that Absorption may play an influential role. There are two contrasting positions on the relationship that trait Absorption will bear on the pattern of occurrence of these different profiles of subjective experience. One is that higher Absorption will entail more differentiation and more integration (Hunt's view); the other is that higher Absorption will entail less differentiation and less integration (my view). If developmental data were available, deriving from a longitudinal study, these two hypotheses could be put to empirical test. The present data set derives from a cross-sectional study (which is a clear limitation), but does enable one to inspect the pattern of occurrence of the different profiles (see Figures 1 and 2), thus allowing for a tentative appraisal of these contrasting positions. As noted above, the pattern is one of high differentiation for respondents scoring low on Absorption (Figure 2a); then relatively (to Figure 2a) less differentiation for respondents scoring slightly lower than the median for Absorption (Figure 2b); then relatively (to both Figure 2a and Figure 2b) more differentiation for those scoring slightly higher than the median for Absorption (Figure 2c); and then, markedly less differentiation for respondents scoring high on Absorption (Figure 2d). Thus, both positions find support in these data: higher Absorption entails more differentiation as one moves from those respondents scoring slightly lower than the median to those scoring slightly higher than the median on Absorption; and very high Absorption entails less differentiation relative to very low Absorption.

The developmental pattern should also be interpreted in terms of hierarchical integration (again, two contrasting views, as seen above), but here speculation must rule given the nature of the present data. Hunt (1989), for example, notes the clear affinity between lucid dreaming and the OBE:

> Not only are lucid dreams and out-of-body experience statistically correlated; they also have a close logical and definitional similarity, involving the unusual development of a detached observational attitude and its tenuous balance with participatory involvement. In addition, if the out-of-body experience ends in 'dream travel' to a setting that no longer includes the imagistic construction of one's own body percept, it is indistinguishable from lucid dreaming; and if the lucid dreamer attempts to become fully aware of his/her sleeping body, the situation may be indistinguishable from classic out-of-body accounts. Indeed, several empirical examples show just these continuous transitions between the two states… (Hunt, 1989, p. 121)

That is to say, these two states might well be integrated, or dedifferentiated. In a similar vein, the hypnagogic state and the hypnopompic state might also be integrated (Jones et al., 2009), as also the hypnagogic state with that of lucid dreaming (Stumbrys, 2011). Such local integration (which might actually reflect a lack of differentiation) of two states, does not, however, aptly convey Werner's portrayal of hierarchical integration of subjective experience. What might that entail? Future research into these states of consciousness should consider how one state is transformed into another, and how, having made the transition to, for example, lucid dreaming, the respondent now experiences a transitional state, such as the hypnagogic state. With more phenomenological data here, we might be able to answer just what this hierarchical integration entails.

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