

An Exploratory Investigation into the Association of Neuroticization, Cognitive Style, and Spirituality to Reported Altered States of Consciousness in Women Experiencing Childbirth

Nikolai Gruzdev and Dimitri Spivak

Institute of Human Brain, Russian Academy of Sciences
St. Petersburg, Russia

This study examined the relation of altered states of consciousness to neuroticization, spiritual experience, and divergent thinking in a sample of women (N= 102) at late pregnancy and post-delivery. The results suggest that stress associated with imminent childbirth is linked to higher levels of ASCs and that neuroticization and spirituality seem to be implicated in the induction of ASCs.

Altered states of consciousness (ASC) are regarded by the authors of the present paper as possible, although non-optimal, coping strategies which tend to occur under stressful conditions and may be produced by a variety of endogenous and exogenous factors. Based upon an analysis of the existing literature, as well as on ideas and information obtained from conferences and congresses on ASC, we have identified three plausible factors as contributing to the occurrence of ASC. First, ASC may be considered a manifestation of borderline pathology and neuroticization (Ludwig, 1969; Kurchenko, Petrenko, & Rassokhin, 1998). Second, ASCs are induced by a cognitive process such as those involved in spontaneous creativity (Martindale & Greenough, 1973; Dittrich, 1998). Third, ASCs are part of a vaster realm of religious and/or spiritual phenomena and form an independent dimension of inner life (Tart, 1972; Nalimov, 1989). Empirical research has not yet been done which looks at how all three factors—neuroticization, spontaneous creativity, and religious/spiritual experiences—contribute to possible ASCs in normal people.

The purpose of this study was to complete an exploratory examination of the how the three factors relate to the occurrence of ASCs in a sample of normal women in late pregnancy who went through the birth process. Despite its being obviously gender specific, the use of such a sample seems to be very constructive for studying ASC. On the one hand, birth stress is usually quite strong and thus likely to lead to higher rates of ASCs (Brudal, 1989; Vaughan & Maliszewski, 1982); on the other, it is physiological, more

natural, less traumatic, and culturally acceptable (for more detailed discussion see Spivak et al., 1998; Abramchenko & Kovalenko, 2001).

Method

Participants

The *main sample* consisted of 102 respondents of practically normal pregnant women in late pregnancy ranging in age from 18 to 39 years (Mean = 24.6), 59 of whom were tested twice. Eleven percent of tested respondents were not married; almost ninety percent of women were giving birth for the first time. Almost half of these women (46 per cent) were hospitalized at least once during this pregnancy (i.e., due to early or late toxicosis). Education level of the sample was above average: 44 per cent had higher education, while 13 per cent were still attending college or university.

It is known that even minor health problems are likely to produce neurotic symptoms in participants. In order to avoid the impact of somatic pathology upon our data, when forming a sample for this study, we accepted women only with minor and/or insignificant somatic disorders related to pregnancy. All women volunteered to participate in this research, which was performed under constant supervision of medical personnel.

A reference group of students and teachers of Herzen State Pedagogical University in St. Petersburg, Russia, experiencing everyday-life stress was also obtained. This group was made of 82 women ranging in age from 19 to 56 years old (Mean = 25.8).

Measures

UN Scale (Wasserman, 1999). To formally assess the effect of clinical and sub-clinical forms of borderline psychic pathology, we have used questionnaire for express diagnostics of neurotization level (labeled in Russia as the “UN scale”), constructed at the Laboratory of Clinical Psychology of Bechterev Institute of Psychoneurology in St. Petersburg, Russia. The questionnaire is comprised of a diagnostic scale measuring the probability of occurrence of neurotic episodes and a control scale of social desirability. Seven degrees of neurotization level are distinguished (ranging from extremely high to extremely low); negative scores indicate acute neurotization, while high positive scores (over 30 points) point at low neurotization level.

SAN Test. This is a test commonly used in Russia. The name of the test is a Russian abridgement of “General Comfort, Activity, Mood.” The instrument is based upon the main ideas underlying the Test of Differential Self-Evaluation by Charles Osgood (see Burlachuk, Morozov, 2000). The Osgood method is a development of the Likert scale in that three major factors or dimensions of judgment were added: evaluative factor (e.g., good-bad); potency factor (e.g., strong-weak); and activity factor (e.g., active-passive) (Summers, 1970). The SAN test helps to differentiate one’s attitudes towards his/her own feelings, sensations and behavior. Five subscales of ‘SAN’ test are: psychic activation; interest (motivation to do anything); emotions (the scale discriminates depressive tendencies); tension (anxiety), and comfort. High scores for this test tend to reveal maladaptive tendencies in respondents, manifested by lowered psychic activation, increased anxiety, combined with depressive episodes, subjective sense of discomfort, and low motivation to perform any action.

Divergent Thinking Test (DTT). Used to assess spontaneous creativity in this study, this test originally belonged to the Creativity Assessment Packet by F. Williams, and was adapted in Russian by Tunik (2003). This test measures creativity in relation to five cognitive factors: fluency; flexibility; originality; elaboration; and the verbal component of creativity.

Index of Core Spiritual Experience (INSPIRIT; Kass, et al., 1991). This test measures the occurrence of experiences that convince one that the God exists, that evoke feelings of closeness with God, and produce various other religious actions and attitudes. The INSPIRIT used in this research was originally constructed to measure health-promoting effect of core religious experiences in outpatients of hospital-based behavioral medicine programs (Kass, et al., 1991). It was found by Kass and colleagues (1991) that intrinsic (or mature) religiosity tends to protect individuals from stress-related components of illness. This index was translated by us into Russian specifically for this study (permission was

granted by the author), and approbated on a sample of university students, before it was used for observation in the clinic.

In preliminary research, we found the factor structure of the Russian version of INSPIRIT was almost identical to the original English one, with one interesting difference. In the original (American) testing, all seven items were unified in a single factor, showing moderately high correlation with intrinsic religiousness scale of the ‘Religious orientation inventory’ (ROI, by Allport & Ross, 1967). In the Russian INSPIRIT, six items of the inventory formed a unified scale; the seventh one, consisting in the “perception of God dwelling within oneself,” did not correlate with other test items, and formed in this way a separate factor. Despite this discrepancy, our findings suggest that spiritual/religious experiences tend to be described in universal terms (at least, common for the average American and Russian urban dwellers). The reliability of the Russian INSPIRIT was found to be adequate for research purposes ($\alpha = .69$).

Assessment of Personal Religiosity Structure (APRS; Scherbatyeh, Myagkov, & Kravtsov, 1996). This instrument is used to study attitudes toward various aspects of religious thought and behavior. Test scales are (a) Religion as philosophy doctrine, (b) Attitudes toward magic, (c) Tendency to look for support and relief in religion, (d) Features of extrinsic religiousness, (e) Interest in pseudoscience, (f) Acceptance of God as Creator (Creationism), (g) Religious self-awareness (intrinsic motivation in worship), and (h) Attitudes towards religious morale. The APRS was used to study face and concurrent validity of two measures examining religious/spiritual dimension and, initially expected, it has shown moderately high positive correlations with the INSPIRIT score ($r = 0.64, p < 0.01$). Factor structure of the test perfectly corresponded to data obtained by Myagkov, Scherbatyeh, and Kravtsov (1996). High scores were related to intrinsic religious orientation, while low scores corresponded to immature or extrinsic religious orientation.

Short Inventory for Altered States of Consciousness (ASC). To assess the level of ASC, we constructed a short inventory, mostly based on well-known and reliable clinical questionnaires, elaborated by Dittrich (1998) and vanQuekelberghe et al. (1991). Our questionnaire is comprised of 15 items that were found to be the most frequently reported by participants in our earlier studies of ASC in contemporary urban dwellers (see Appendix).

Test scores from the ASC questionnaire were interpreted as follows: positive replies to less than four (out of 15) items (i.e., scores under 40 points) of ASC inventory were considered as indicating low level of ASC, or their absence. Seven or more positive responses indicated presence of moderately and highly pronounced ASC experiences (i.e., scores over 90 points).

Scale	Pre-Delivery (n= 102)		Post-Delivery (n=59)		Reference Group (n=82)	
	Mean	SD	Mean	SD	Mean	SD
Altered States of Consciousness Level (ASC)	67.70	32.70	55.20	30.30	81.20	40.20
UN- Neuroticization Level Inventory	35.40	42.20				
UN- Social Desirability	2.20	1.40				
Divergent Thinking Test (DTT)	71.90	8.70	71.20	11.80		
INSPIRIT	2.48	0.61			2.64	0.46
Assessment of Personal Religiosity Structure (APRS)	45.70	10.50				
SAN Test	54.80	12.40	51.20	15.80		

Procedure

We used a within-subject design for our study and tested the same subjects twice: first, 1-2 weeks prior to delivery, and second, 2-4 days post partum. The complete set of six psychological tests was filled out during the first testing; and only three inventories (i.e., ASC scale, DTT, and the SAN test) were used for the second testing. All testing was conducted in Russian, as all members of both the main and the referent group spoke Russian as the first language.

The reference group completed the ASC questionnaire and the INSPIRIT test, providing in this way reference scores for both measures. Thus in testing the reference group, our primary goal was to collect data on frequency of occurrence of ASC in everyday life conditions, devoid of impact of considerable stress.

Results

Table 1 presents means and standard deviations for all test scores. Sixteen percent of participants in the pregnant women group reported a strong presence of ASC experiences at pre-delivery state, compared to only 6.7 per cent of tested respondents at post-partum period. Mean INSPIRIT items scores in the Russian sample were considerably lower than the ones reported by Kass et al. (1991) in his initial study ($M = 2.8$; $SD = 0.83$). High scores were obtained in 8.5 per cent of subjects, compared to 26 per cent in the American sample.

Analysis of the intercorrelations among all measures acquired at pre-delivery (see Table 2) revealed moderate pos-

Table 2

Correlations Between Measures at Pre-Delivery

	1	2	3	4	5	6	7
1. ASC							
2. UN Social Desirability	-.27*						
3. UN Neuroticization	-.33*	.17					
4. DTT	.04	.18	.07				
5. INSPIRIT	.42*	-.10	-.23*	-.07			
6. APRS	.31*	-.10	-.27*	-.09	.64*		
7. SAN Test	.15	-.16	-.47*	-.07	.01	-.01	

Note. N= 102, * $p < .05$.

itive correlations ($p < .05$) between ASC level and both the INSPIRIT ($r = .42$) and the APRS ($r = .31$), along with moderate negative correlations between ASC score, UN Social Desirability ($r = -.27$), and UN Neuroticization level ($r = -.33$). A moderate correlation ($p < .05$) between ASC level and religious attitudes scale ($r = .28$) was found at the post partum period (see Table 3). In the non-pregnant referent group we also found moderate positive correlation between ASC level and INSPIRIT scale ($r = .39$, $p < .05$). The DTT was not found to significantly associate with ASC or any other test.

In order to assess significant differences between subscale scores of the "SAN test" from pre- to post-delivery (pregnant women, $n = 59$), that is, before passing the supposed peak of stress (i.e., delivery) and after it, Wilcoxon's T-test for dependent samples was completed. Differences in

Table 3
Correlations Between Measures at Post-Delivery

	1	2	3	4	5	6	7
1. UN Social Desirability ^a							
2. UN Neuroticization ^a	.21						
3. INSPIRIT ^a	-.20	-.15					
4. APRS ^a	-.10	.18	.07				
5. ASC	-.25	-.23	-.12	.28*			
6. DTT	.03	-.04	-.17*	-.10	.04		
7. SAN Test	-.23	-.12	.17	-.00	-.21	-.18	

Note. n= 58, *p<.05. For variables marked with superscript "a", data were obtained at pre-delivery. Given that the measures used at pre-delivery marked with the superscript are personality inventories and can be assumed to be assessing stable traits, these tests were not given to participants a second time.

three subscale scores (interest, emotions, and tension/anxiety subscales) were found and suggested improvement in motivation and emotional condition in new mothers, but also increased level of personal tension/anxiety (see Figure 1).

One-way ANOVAs comparing ASC and INSPIRIT scores between pregnant women and reference group were performed. Despite the fact that ASC mean score for the reference group was somewhat higher than the one in pregnant women sample at pre-delivery, differences between score variances were not significant. INSPIRIT scores in the reference group were also higher than in the sample of pregnant women, but the difference was found to be nonsignificant.

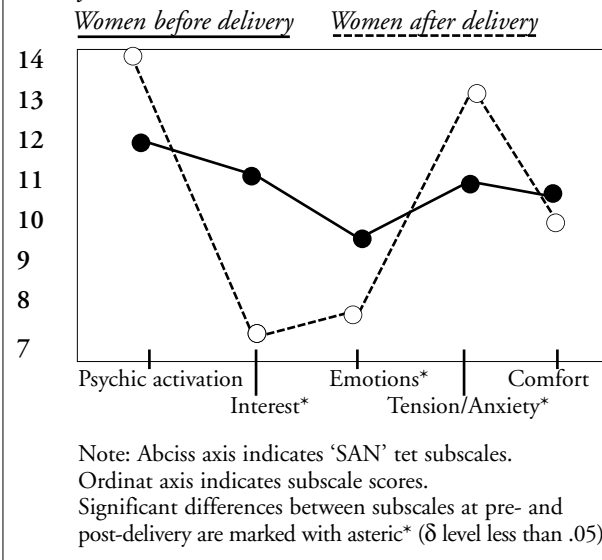
Repeated measures ANOVA for pre- and post-delivery examinations of ASC level showed a significant difference between two measurements (Wilks test: $F(2, 57) = 143.86$, $p < .001$).

Discussion

The results of this investigation provide partial support for the association of religious/spiritual experience, neuroticization, and cognitive style to the occurrence of altered states of consciousness in a sample of women experiencing late pregnancy and childbirth, though in a manner not wholly consistent with the available literature. In terms of the former, both the INSPIRIT and the Assessment of Personal Religiosity Structure demonstrated moderately strong positive correlations with ASC inventory scores at pre-delivery, while only the APRS showed a significant correlation with ASC at post-delivery. This suggests that spirituality/religiosity, both beliefs and experiences, may be important factors contributing to the occurrence of ASCs in normal people.

With regards to neuroticization, negative correlations between the ASC inventory and the UN Neuroticization

Figure 1
Differences in scores of SAN test subscales at pre- and post-delivery



and Social Desirability scales were found at pre-delivery but not at post-delivery. This finding, which indicates that higher levels of neuroticization are associated with higher levels of ASC while experiencing the stress of imminent childbirth but not subsequent to such stress, is somewhat consistent with expectation given existing research on the topic. This finding could be interpreted as suggesting that neuroticization as a personality trait may be more relevant to the activation of ASCs when a person is under stress than when he/she is not. If so, such a result would fall in-line with stress-diathesis or vulnerability-stress models of psychopathology and allow for neuroticization to be treated as a vulnerability factor for ASCs. Clearly, further research is needed to explore the robustness and meaning of this result.

Finally, cognitive style as reflected in creativity and more specifically, divergent thinking, was found to be unrelated to ASC. While the complete lack of association may reflect a true absence of relationship with cognitive style, it appears plausible to argue that the findings show that divergent thinking as just one type of cognitive style is not the type related to the occurrence of ASCs. Other cognitive styles, such as those suggested in Jungian psychological typology, may prove to be more fruitful to pursue in future studies.

In addition to these findings, the present study also found that women while experiencing childbirth-related stress reported higher numbers of altered states of consciousness. This was observed in the repeated measures ANOVA where post-delivery scores were found to be significantly lower than pre-delivery scores and corroborated with the analyses of the SAN test subscale scores which revealed a significant drop in three scores (i.e., interest, emotions,

and tension/anxiety) at post-delivery. This result is very much in line with past research as well as with our own model of the birthing process, which asserts that stress serves as a causal mechanism for ASCs.

Future research aimed at assessing the extent to which these results are gender-specific is needed. Studies attempting to establish how stress, spirituality, and neuroticization contribute to the induction of altered states of consciousness through causal path modeling could also be very fruitful. Lastly, efforts should be made to link the three factors to brain mechanisms (e.g., for preliminary results of this research see Spivak, Bechtereva, Danko, Spivak, & Bolotskikh, 1997).

Author Note

This study was supported by the Russian Foundation for Basic Research, grant 06-06-80048.

The authors are grateful to Dr. Douglas A. MacDonald and Professor N. P. Bechtereva for valuable advice and corrections.

References

- Abramchenko, V., & Kovalenko, N. (2001). *Postnatal psychology: Theory, methodology, practice*. St. Petersburg, Russia: St. Petersburg University Press (In Russian).
- Allport, G. W. & Ross, J. M. (1967). Personal religious orientation and prejudice. *Journal of Personality and Social Psychology, 5*, 432-443.
- Brudal, L. F. (1989). *Psysiske kriser i et nytt perspektiv*. Oslo: Tano.
- Burlachuk L.F., Morozov, S.M. (2000) Psychodiagnostic dictionary. St. Petersburg, Russia: Piter (In Russian).
- Dittrich, A. (1998). The standardized psychometric assessment of altered states of consciousness (ASCs) in humans. *Pharmacopsychiatry, 31*(7), 80-84
- Kass, J. D., Friedman, R., Lesser, J., Zuttermeister, P., & Benson, H. (1991). Health outcomes and a new index of spiritual experiences. *Journal for the Scientific Study of Religion, 30*(2), 203-211
- Kurchenko, V. V., Petrenko, V. F., & Rassokhin, A. V. (1998). Altered states of consciousness: Psychological analysis. *Voprosy Psichologii, 3*, 70-77. (In Russian).
- Ludwig A. (1969). Altered states of consciousness. In C. Tart (Ed.), *Altered States of Consciousness* (pp. 9-10). New York: Wiley.
- Martindale, C., & Greenough, J. (1973). The differential effect of increased arousal on creative and intellectual performance. *Journal of Genetic Psychology, 123*, 329-335.
- Myagkov, I. F., Scherbatych, Y. V., & Kravtsov M. S. (1996). Psychological analysis of subjective religiosity. *Psychologicheskyy Zhurnal, 17*(6), 119-122. (In Russian)
- Nalimov, V. (1989). *Spontaneity of consciousness: Probabilistic theory of meaning and semantic architectonics of consciousness*. Moscow: Prometei. (In Russian)
- Spivak, L.I., Bechtereva, N. P., Spivak, D.L., Danko, S.G., & Wistrand K.-R. (1998). Gender specific altered states of consciousness. *International Journal of Transpersonal Studies, 17*(2), 181-185.
- Spivak, L. I., Bechtereva, N. P., Danko, S. G., Spivak, D. L., & Bolotskikh V. M. (1997). Electrical brain activity as a mental state correlate of parturients. *Human Physiology, 23*(5), 550-555.
- Summers, G. F. (Ed.). (1970). *Attitude measurement*. Chicago: Rand McNally, P. 235-253.
- Tart, C. (1972). States of consciousness and state-specific sciences. *Science, 176*, 1203-1210
- Tunik, E. (2003). *Modified creativity assessment packet by F. Williams*. St. Petersburg, Russia: Rech.
- Van Quekelberghe, R., Altstötter-Gleich, G., & Hertweck, E. (1991). Assessment Schedule for Altered States of Consciousness: A brief report. *Journal of Parapsychology, 55*(12), 377-390
- Vaughan, B. J., & Maliszewski, M. (1982). Ecstatic components of childbirth: A psychological and phenomenological investigation. *Birth Psychology Bulletin, 3*(1), 5-13.
- Wasserman, L. I. (Ed.). (1999). *Questionnaire for Express Diagnostics of Neurotization Level ('UN' scale). Research note and manual*. St. Petersburg, Russia: Laboratory of Clinical Psychology, Bechtereva Institute of Psychoneurology. (In Russian)

Appendix

Items of ASC questionnaire (translated from Russian)

1. I have heard unusual noises (sounds, voices, whispering, singing)
2. I was feeling happy and miserable at the same time
3. I had some unusual fantasies
4. I felt myself rather susceptible to suggestion
5. I have had nightmares
6. I have seen some strange light flashes (shimmering light, rays, silhouettes of objects and creatures)
7. I have had mystical (religious) experiences
8. I had vivid and recurring memories
9. I could comprehend reticent meaning of words in conversations with people
10. I was flying in a dream
11. I was leaving my body and seeing myself from the outside
12. I have had unusual desires

13. *I have had existential insights and understood the meaning of life*
14. *I have experienced almost telepathic contact with my absent family members and friends*
15. *I had dreams in my sleep that came true*

Subjects reported frequency and subjective intensity of experienced listed above using following scale:

About how often have you had such experience...in the course of the latest 12 months (control group)/ ...since you've learned about your current pregnancy (main group)?

Never – Once or twice – Sometimes – Quite frequently – Very often

If you had an experience of this kind, indicate please how strong it was (usually)

Almost indiscernible – Weak – Medium – Fairly strong – Very intensive

Responses for each question received a score from 1 to 5 (scores increase along with intensity/strength of experiences) resulting in two indices for every item. Two indices were then multiplied, giving the final score for each item of ASC scale. This was done to assess relative frequency and intensity of unusual experiences, instead of merely stating the fact of their presence/absence in subjects.

Correspondence regarding this article should be directed to D. Spivak at d.spivak@mail.ru