In: Psychology of Individual Difference ISBN 978-1-61209-926-2
Editor: Lucy M. Bertrand and Ryan A. Nielson, pp.

Chapter 10

BIS/BAS INDIVIDUAL DIFFERENCES, SPATIAL ABILITY AND VERTIGO AND PANIC ATTACKS IN AN UNIVERSITARY SAMPLE

Hipólito Marrero Hernández, Elena Gámez Armas and José Miguel Díaz Gómez
Universidad de La Laguna, Spain

INTRODUCTION

Vertigo and panic attacks are usual clinical problems among young people. Both have been related to certain psychological factors and predispositions, as anxiety disorder (Staab and Ruckenstein, 2003). Moreover, appearances of vertigo and panic attacks are strongly related (Simon, Pollack, Tuby and Stern, 1998). Here we consider that both panic attacks and vertigo have in common one characteristic: people feeling without control, either from the sensation of external objects moving toward them (vertigo), or from an abrupt and intense fear (that could be provoked by being unconscious of personal threats and problems). In this context, we consider that vertigo and panic attacks would be related to difficulties in controlling approach/distance to objects and (symbolically) to events that could affect the Self, either positively or negatively.

There are two broad motivational processes in human beings: approach and avoidance. In accordance with the Reinforcement Sensitivity Theory (RST, see Corr, 2008), approach processes refer to sensitivity to reward, and are regulate by the Behavioural Approach System (BAS). This system is said to be sensitive to signals for reward (or non-punishment) and escape from punishment. Activity in this system causes the person to begin (or to increase) movement towards goals. BAS is responsible for the experience of positive feelings such as hope, elation and happiness. Greater BAS sensitivity should be reflected in greater proneness to engage in goal-directed efforts and to experience positive feelings when the person is exposed to cues of impending reward.

Avoidance processes refer to threat and punishment stimuli and are regulated by two behavioural motivational systems. On the one hand, the Fight-Flight-Freeze System (FFFS)

that is triggered by punishment stimuli, being its motivational consequence "defensive avoidance", and "fear" the emotional one. On the other hand, the Behavioural Inhibition System (BIS), that is activated in the presence of mixed valenced stimuli that lead to approach/avoidance conflict (for example, if someone has to approach a positive stimuli which could lead her to a potential negative consequence, as is the case in drinking alcohol). Its motivational consequence is "defensive approach", and anxiety its emotional consequence.

In order to explore this hypothesis that vertigo as well as panic attacks would be related to difficulties of individuals controlling approach/distance, 118 students at the University of La Laguna responded: (a) The BIS/BAS scale (Carver and White, 1994) to measure individual differences in approaching/avoidance motivation; and (b) A test of spatial ability (Rotation of Solid figures Test, Yela, 1969): Those were the predictors in a regression analysis. The predicted variables were the frequencies of episodes of panic attacks and vertigo measured by two self-report questions.

METHOD

Subjects

One hundred eighteen students at the University of La Laguna participated in exchange for course credit.

Measures

BIS/BAS scales: There are different BIS/BAS measures (Carver and White, 1994; Caseras, Ávila and Torrubia, 2003). We use the Carver and White scales, which have been reported as useful in several studies (see Carver, 2006). The scales are a 20-item four-point Likert-type measures of BIS/BAS motives, composed of the following four subscales:

- BIS measures both fear (and the FFFS system) and anxiety (the BIS itself), with items that reflect concern and fear about the possibility of a bad occurrence, or sensitivity to such events when they do occur (e.g., "Criticism or scolding hurts me quite a bit").
- BAS-Reward Responsiveness (BAS-RR) includes items reflecting responsiveness to reward (e.g.," It would excite me to win a contest").
- BAS-Drive (BAS-D) includes items relating to the tendency to act quickly and strongly in pursuit of appetitive goals (e.g., "I go out of my way to get things I want").
- BAS-Fun Seeking (BAS-FS), with items referring to the tendency to seek out new potentially rewarding experiences (e.g., "I crave excitement and new sensations").

Respondents were asked to rate the extent of their agreement, from 1 *(strongly disagree*) to 4 (*strongly agree*). Internal consistencies of the scales ranged from good to excellent, and test-retest reliability, convergent and divergent as well as factorial validity were satisfactory

(Carver and White, 1994). In the current study, the sample had alpha values of .70 for BIS, .74 for BAS-RR, .43 for BAS-D and .67 for BAS-FS. These values are all acceptable, specially those of BIS and BAS-RR (George and Mallery, 1995).

Test of rotation of solid figures (Yela, 1969): Inspired by one of Thurstone's tests (solid figures), it consists of identifying solid blocks seen from different positions. It is a test on spatial vision with paper and pencil, considered as a useful test for selection, among others, of professionals who require manipulating objects.This test comprises 21 items. Each one includes a model figure and five alternatives that must be evaluated against it. Participants must choose which alternative can be rotated within a 3D space to fit the model figure. Only one alternative is correct. The score was the total number of correct responses. The reliability index for this measure (Cronbach's a) is .89.

Self-report questions: the questions were worded as follows:

"I have had vertigo episodes"

"I have had panic episodes"

Respondents are asked to rate the extent of their frequency, from 1 *(never*) to 4 (*frequently*).

RESULTS

As found in previous research, the suffering of vertigo and panic attacks was significantly related in the whole sample (R= 0.310, p= 0.001, N=118). By gender, this relation was significant for females (R= 0. 389, p= 0.000, N= 97), but not for males (R= -0.092, p= 0.691, N= 21). Regression analysis showed that individual differences in spatial ability and BIS/BAS scales were significantly related to the frequency of panic attacks (R squared=0.18; F (5, 104) = 4.53, p= 0.001). However, a similar regression analysis on the frequency of vertigo episodes failed in reaching significance. In Table 1 the values for the predictive variables in the first regression analysis (on panic) are shown.

Table 1. Multiple linear regression values of the predictive variables of panic attacks

BIS/BAS scales	Beta	T	P
BAS-RR	-0.215	-1.99	0.049
BAS-FS	0.115	1.035	0.303
BAS-D	0.111	1.065	0.289
BIS	0.341	3.406	0.001
RSF	-0.206	-2.19	0.031

As can be seen, there are three predictive significant variables: BAS Reward Responsiveness, BIS, and the psychometric spatial ability. It seems that panic attacks tend to be prevented from the Self being motivated for pursuing rewards (BAS-RR scale), but enhanced by a greater difficulty of keeping the Self distance from the possibility of bad events (BIS scale). Moreover, and also relevant, individual differences in spatial ability exert a significant role. A high spatial ability is negatively related to suffering panic episodes.

CONCLUSIONS

In accordance with our exploratory hypothesis, participants with a greater difficulty for controlling the Self distance from the possibility of bad occurrences, showed a greater propensity to panic episodes. Conversely, participants who approach objects and events in a discriminative way (when a reward is present) showed a lesser propensity to panic episodes. Here, we have to take also into account that neither BAS-D nor BAS-FS, the scales that measure the impulsivity component of BAS, were significant in the regression analysis.

We have suggested that controlling the self for approach/distance refer to both physical objects and (symbolically) personal and social events. In accordance to our exploratory hypothesis, participants with a higher spatial ability as measured by the test on rotation of solid figures, associated with manipulation of objects, tended to show fewer propensities to panic episodes.

REFERENCES

Carver, Ch. S. and White, T. L. (1994). Behavioral activation and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67(2),* 319-333.

Carver, Ch. S. (2006). Approach, avoidance, and the self-regulation of affect and action. *Motivation and Emotion, 30,* 105-110.

Caseras, X., Ávila, C., and Torrubia, R. (2003). The measurement of individual differences in Behavioural Inhibition and Behavioural Activating Systems: A comparison of personality scales. *Personality and Individual Differences, 34,* 999-1013.

Corr, P.J. (2008). *The reinforcement sensitivity theory of personality.* Cambridge: Cambridge University Press.

Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist, 12,* 671-684.

George, D., and Mallery, P. (1995). *"SPSS/PC +" Step by step: A simple reference.* Belmont, California: Wadsworth Publishing Company.

Simon, N.M., Pollack, M.H., Tuby, K.S., and Stern, T.A. (1998). Dizziness and Panic disorder: A review of the association between vestibular dysfunction and anxiety. *Annals Clin Psych, 10, 2,* 75-80.

Staab, J.P., Ruckenstein, M.J. (2003). Which come first? Psychogenic dizziness vs. otogenic anxiety. *Laryngoscope, 113,* 1714-8

Yela, M. (1969). Rotación de figures macizas *(Rotation of Solid Figures).* Madrid: TEA.