



## The tripartite model of fear in children with specific phobias: Assessing concordance and discordance using the behavioral approach test

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### ABSTRACT

Lang's tripartite model posits that three main components characterize a fear response: physiological arousal, cognitive (subjective) distress, and behavioral avoidance. These components may occur in tandem with one another (concordance) or they may vary independently (discordance). The behavioral approach test (BAT) has been used to simultaneously examine the three components of the fear response. In the present study, 73 clinic-referred children and adolescents with a specific phobia participated in a phobia-specific BAT. Results revealed an overall pattern of concordance: correlation analyses revealed the three indices were significantly related to one another in the predicted directions. However, considerable variation was noted such that some children were concordant across the response components while others were not. More specifically, based on levels of physiological arousal and subjective distress, two concordant groups (high arousal–high distress, low arousal–low distress) and one discordant (high arousal–low distress or low arousal–high distress) group of youth were identified. These concordant and discordant groups were then compared on the percentage of behavioral steps completed on the BAT. Analyses revealed that the low arousal–low distress group completed a significantly greater percentage of steps than the high arousal–high distress group, and a marginally greater percentage of steps than the discordant group. Potential group differences associated with age, gender, phobia severity, and phobia type were also explored and no significant differences were detected. Implications for theory and treatment are discussed.

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According to Lang's tripartite model (Lang, 1967, 1979; Lang, Cuthbert, & Bradley, 1998; Lang, Levin, Miller, & Kozak, 1983), the emotion of fear is comprised of a neural network of three loosely coupled components: physiological arousal, cognitive (subjective) distress, and behavioral avoidance. Although activity in one of these components can activate the remaining components, the extent of "diffusion" is dependent upon the strength of the initiation and the level of fear. In some instances, the three components co-vary with one another and in other instances the components do not respond in concert. In fact, it is possible for any one of the components to be in ascendance while the others lay relatively dormant. Thus, although some fearful individuals experience high physiological arousal and subjective distress and avoid the phobic stimulus, others experience high physiological arousal and subjective distress but do not avoid the phobic stimulus. All combinations of the three components of the neural network are possible.

Over 35 years ago, Hodgson and Rachman (1974) referred to this phenomenon as concordance versus discordance. That is, when the three components co-vary with one another they are said to be concordant; however, when they vary independently of one another they are said to be discordant. Concordance is hypothesized to be high when there is strong emotional arousal (Hodgson & Rachman). Lang and Cuthbert (1984) also suggest that concordance among the three response components would be greater in individuals with specific phobias versus other anxiety disorders since the fear response would likely be heightened in these disorders.

The behavioral approach test (BAT) is a laboratory-based behavioral measure designed to simultaneously elicit the three components of the fear response (Borkovec, Weerts, & Bernstein, 1977; Dadds, Rapee, & Barrett, 1994). The test consists of a number of increasingly difficult steps in which individuals are asked to approach a phobic object or situation, but are told they can stop the test at any time they wish to do so. During the BAT, individuals' physiological responses are recorded and they are asked to provide "subjective units of distress" (SUDS) ratings immediately after encountering the phobic object or situation.

A number of studies have used the BAT to examine the phenomenon of concordance/discordance; however, all of these

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studies have been undertaken with adults. For example, Öst, Stridh, and Wolf (1998) found the behavioral and subjective components of the BAT to be significantly and inversely related in a group of spider phobic adults. Unfortunately, they did not examine whether these indices were concordant with physiological measures. In a similar investigation of blood phobic adults, Hellstrom, Fellenius, and Öst (1996) found that high levels of subjective anxiety were associated with low percentages of steps completed on the BAT; however, they too failed to assess whether physiological arousal was related to these behavioral and cognitive indices. Other studies, however, have shown positive relations between subjective distress and physiological responding (Lewis & Drewett, 2006; Sartory, Rachman, & Grey, 1977). And, in a single case study assessing all three response components, Schwartz, Houlihan, Krueger, and Simon (1997) found concordance among behavioral avoidance, subjective distress, and elevated blood pressure in a woman with a specific phobia. However, not all studies have demonstrated concordance among the three response channels. For example, Côté and Bouchard (2005) conducted BATs with spider phobic adults and reported a small and non-significant correlation between the number of steps completed and physiological arousal.

In addition to these studies, other researchers have examined individual differences that might moderate the degree of concordance among the three response systems. In an attempt to directly test Hodgson and Rachman's (1974) hypothesis that level of emotional arousal would be one such moderator, Kaloupek and Levis (1983) used the BAT to examine fear of snakes in women who differed in level of arousal. Individuals who were unable to make physical contact with the snake were assumed to be more highly aroused than individuals who could touch the snake. Contrary to their hypothesis, they found that those women who were presumably less emotionally aroused had a greater degree of concordance among the three response components on the BAT, whereas those who were more emotionally aroused evidenced discordance. With more fearful individuals, Calvo and Miguel-Tobal (1998) found the expected effects; namely, those individuals high in arousal displayed a greater amount of concordance among the three components of the fear response during a social-evaluative BAT. Sartory et al. (1977) obtained similar results in a study of adults with specific phobias.

Two possible reasons have been put forth to account for the increase in concordance as a result of heightened emotional arousal (Calvo & Miguel-Tobal, 1998). First, individuals who experience stronger emotional reactivity might be better able to perceive their physiological arousal and adjust their self-reported distress ratings to match their heightened physiological state. This possibility fits nicely with Lang and Cuthbert's (1984) theory that the expression of fear occurs most readily when associated brain networks are accessed and processed. Such is thought to occur when a sufficient number of propositions are activated by environmental stimuli or internal associations. A second reason for these findings is that for individuals who are low in emotional arousal, there may be a bias to avoid processing threatening stimuli and to inhibit reporting distress (Calvo & Miguel-Tobal; Kaloupek & Levis, 1983). These behavioral and cognitive mechanisms consequently perturb the level of concordance that is detected.

Overall, studies of concordance and discordance in adults have yielded mixed results. One likely reason is methodological differences, particularly in the varying ways the three response components are measured, how emotional arousal is defined, and the use of clinical versus non-clinical participants (Turpin, 1991). In addition, others have suggested the mixed results may be accounted for by differences in concordance due to demographic and clinical variables such as age (Teachman & Gordon, 2009), gender (Avero &

Calvo, 1999), use of divergent coping strategies activated during the BAT (Calvo & Miguel-Tobal, 1998; Kaloupek & Levis, 1983), and the type of specific phobia (Davis & Ollendick, 2005).

The present study examined concordance and discordance in a group of children and adolescents with specific phobias who completed phobia-specific BATs. To date, only a few studies have used the BAT with phobic children, and those studies have limited its use to a treatment outcome measure (Nelissen, Muris, & Merkelbach, 1995; Ollendick et al., 2009; Öst, Svensson, Hellstrom, & Lindwall, 2001). To our knowledge, concordance and discordance in the fear response have not been examined with phobic children and adolescents.

We put forth three hypotheses. First, based on the notion that specific phobias may evidence the greatest amount of concordance of all the anxiety disorders (Lang & Cuthbert, 1984), we hypothesized that concordance would be observed among the three components in our group of clinically phobic youth, such that a) higher subjective distress would be related to a lower percentage of steps completed, b) higher subjective distress would be related to increased physiological arousal, and c) increased physiological arousal would be related to a lower percentage of steps completed. Second, consistent with previous investigations with adults (Avero & Calvo, 1999; Kring & Gordon, 1998; Turner & Beidel, 1985), we formed three groups of children according to whether they were high or low on physiological arousal and subjective distress and determined how they differed in their level of behavioral avoidance (i.e., percent of steps completed on the BAT). In accord with Lang and Cuthbert (1984), we hypothesized that youth categorized as concordant on the physiological arousal and subjective distress indices would evidence co-varying behavioral responses (i.e. high arousal–high distress children would complete fewer steps on the BAT and low arousal–low distress children would complete more steps on the BAT). In addition, we expected children categorized as discordant on these two response components (i.e., high arousal–low distress or low arousal–high distress) would show intermediate behavioral responses on the BAT. This latter hypothesis was based on the notion that activation on only one of these two indices would suggest low emotional arousal and result in less activation on the third index.

Third, we examined potential group differences associated with age, gender, phobia type, and phobia severity. We reasoned that phobia severity (presumably an index of fear level) would be related to emotional arousal during the BAT; accordingly, we hypothesized there would be greater severity of phobias in the high arousal–high distress group, less severity of phobias in the low arousal–low distress group, and intermediate severity of phobias in the discordant group. We also reasoned that phobia type might be related to emotional arousal on the BAT, such that there would be more children with the natural environment type in the high arousal–high distress group, more children with the animal type in the low arousal–low distress group, and an equal number of each in the discordant group. This hypothesis was based on recent findings showing that children with natural environment phobias differ from children with animal phobias on somatic/anxious symptoms, depressive symptoms, life satisfaction, and co-occurring anxiety disorders (Ollendick, Raishevich, Davis, Sirbu, & Öst, 2010). We did not offer hypotheses about situational or blood–injury–injection phobia types because we did not have a sufficient number of youth in the former group to examine such hypotheses and the latter group was specifically excluded from the original study from which these participants were drawn (Ollendick et al., 2009). Finally, because relations among gender, age, and concordance have not yet been examined with children, we had no specific hypotheses about these potential moderators and these analyses were exploratory.

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