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The moderational role of anxiety sensitivity in flight phobia

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ABSTRACT

Anxiety sensitivity (AS) is the tendency to interpret anxiety-related bodily sensations in a threatening way. Previous research in a subclinical population identified AS as a vulnerability factor in flight phobia: AS moderates the relationship between somatic sensations and flight anxiety. The present study aimed at gaining further evidence for the moderational role of AS in a large clinical population with flight phobia.

The data were obtained from 103 participants: 54 flight phobic participants and 49 controls. Just before taking a flight participants were asked to complete the Anxiety Sensitivity Index and to report their level of anxiety and bodily sensations.

Results showed that AS moderates the relationship between somatic sensations and flight phobia: somatic sensations significantly predicted flight anxiety in subjects with higher AS scores, while this was not the case for subjects scoring lower on AS. Present findings implicate that treatment protocols should be supplemented by interventions specifically aimed at reducing AS, especially for individuals high in AS.

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With civil aviation establishing itself as a growing industry, traveling by airplane has become a part of day-to-day life. But not for some: 10–30% of the general population has flight phobia (Van Gerwen, Spinhoven, Diekstra, & VanDyck, 1997), or in other words a fear of flying. Most research efforts have focused on investigating the effects of treatment of this particular phobia. However, in order to set up effective treatment interventions, knowledge of the underlying mechanisms can be crucial. The current study aims at clarifying the role of anxiety sensitivity in flight phobia.

Taking a flight can produce a number of bodily sensations due to specific factors associated with the flying environment, like for example acceleration (Jaffee, 2005), pressure changes (Harding & Mills, 1983) and turbulence (Jaffee, 2005). Also, changes in the partial pressure of oxygen can lead to a condition called hypoxia (Mortazavi, Eisenberg, Langleben, Ernst, & Schiff, 2003). Hypoxia is an oxygen deficiency at a cellular level, meaning there is a low oxygen saturation in the blood. Humphreys, Devermond, Bali, Stevenson, and Fee (2005) found that more than half of aircraft passenger have an oxygen saturation of 94% or lower, this is a level where, at sea level, one would be administered supplemental oxygen. Symptoms of hypoxia include shortness of breath, heart racing, and dizziness, which are strikingly similar to the bodily correlates of fear. Analogous to the panic model of Clark (1999) it would thus be possible that the aversive sensations caused by hypoxia are misinterpreted as signs fear and panic. Clark proposed that panic attacks are caused by the catastrophic misinterpretation of bodily symptoms. Such misinterpretation leads to fear which in turn leads to more bodily sensations, eventually resulting in a vicious cycle. Anxiety sensitivity (AS) is thought essential to his vicious cycle. Anxiety sensitivity is the tendency to interpret anxiety-related bodily sensations as threatening (Reiss, 1991). AS has most commonly been associated with PD (McNally, 2002; Taylor, 1995): studies in nonclinical samples have shown that elevated AS is associated with the incidence of panic attacks, moreover, studies in clinical samples have shown that AS is greater in PD than in other anxiety disorders. However, elevated AS levels have been found in others types of anxiety disorders. A recent meta-analytic review by Naragon-Gainey (2010) has shown that AS is most strongly related to PD, Generalized Anxiety Disorder (GAD) and Post-Traumatic Stress Disorder (PTSD). Social Anxiety, Agoraphobia and OCD are moderately related to ASI. Specific phobia has the weakest link with AS, although it can still be elevated. Interestingly, only fear of confinement (claustrophobia) and fear of bodily harm were related to AS, while fear of blood/injection/injury and animal phobias were not. However, Rivas and Tortella-Feliu (2000) have demonstrated an association between fear of flying and elevated levels of anxiety sensitivity: an elevated AS was found among individuals with fear of flying and moreover, a higher intensity of the fear of flying was associated with a higher AS. Moreover, in a previous study we have explored the specific role of AS as a vulnerability factor in fear of flying, in the sense that anxiety sensitivity moderates the relationship between somatic sensations and flight anxiety (Vanden

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Bogaerde & De Raedt, 2008). About 160 student participants were asked to complete the Flight Anxiety Situations Questionnaire, the Flight Anxiety Modality Questionnaire (Van Gerwen, Spinhoven, Van Dyck, & Diekstra, 1999) and the Anxiety Sensitivity Index (Vancleef, Peters, Roelofs, & Asmundson, 2006). Results showed that the relationship between somatic sensations and in-flight anxiety is stronger for people with higher anxiety sensitivity than for people with lower anxiety sensitivity, indicating that AS is, as hypothesized, a moderator in fear of flying. In order to gain more evidence about the role of anxiety sensitivity in flight phobia, some issues needed to be addressed. First, the previous findings were based on a non-clinical population. Second, measurement of flight anxiety and somatic sensations relied solely on questionnaire data that was gathered in an non-anxious situation.

The present study aimed at gaining additional evidence for the moderational role of anxiety sensitivity in flight phobia. Therefore, the present study was based on a clinical and a healthy control sample. Additionally, in this study we included measurements of somatic sensations and flight anxiety just before participants took a flight to ensure ecological validity of the measurements. Generally, we expect AS levels to be higher in flight phobic subjects than in controls. More specifically, the hypothesis is that AS moderates the relationship between somatic sensations and flight anxiety: individuals with higher AS will respond more anxiously to somatic symptoms than individuals with lower AS, presence of (higher levels of) AS thus strengthens the relationship between somatic sensations and flight anxiety, indicating might function as a vulnerability factor.

1. Method

1.1. Participants

Data collected in this study were obtained from a total of 103 white Caucasian participants. Of the participants 54 participants had fear of flying, 49 were controls. In the flight phobic group 29 were female (54%) and 25 were male (47%). The average age of this group was 40.2 years, ranging from 19 to 65 years (women: M=39.9, SD=10.58 and men: M=40.6, SD=12.85). The control group consisted of 29 males (60%) and 18 females (40%). The average age of the participants in this group was 41.9 years, ranging from 21 to 67 years old (women: M=39.7, SD=12.40 and men: M=43.2, SD=10.77).

Participants with fear of flying were recruited from a treatment program for fear of flying. Participants self-referred for this treatment program. The program is a two-day group cognitivebehavioral program with exposure as the core intervention. Each treatment session group consisted of six participants coached by two clinical psychologists. Before the start of the training there was a diagnostic phase, were participants were asked to fill out a number of questionnaires concerning fear of flying (see below). Also participants had an individual contact with a clinical psychologist to properly assess their flight phobia. This was done with a semi-structured interview,¹ using not only the DSM IV (APA, 2000) criteria, but also a number of questions pertaining to flight history and the onset and development of the flight phobia. Moreover, all participants in the clinical group were assessed with the subdivisions of the MINI - Mini International Neuropsychiatric Interview (Sheehan et al., 1998) pertaining to anxiety. Exclusion criteria for participating in the group treatment program were: a concurrent

Table 1

Percentages of participants reporting the number of flights taken and time since last flight.

	Flight phobics (%)	Controls (%)
Number of flights		
<5	20.4	4.5
5-10	14.8	4.5
10-50	57.4	34.1
50-100	7.4	20.5
>100	0	36.4
Time since last flight		
<1 month	0	51.1
1–6 months ago	21.7	33.3
6–12 months ago	21.7	6.7
1–5 years ago	13.0	8.9
>5 years ago	43.5	0

panic disorder, posttraumatic stress disorder related to an aircraft emergency or any other anxiety disorder that is primary to the fear of flying. These exclusion criteria were set because the specific treatment program was specifically developed to treat fear of flying as a primary phobia. During the first day of the group program, information was given on the technical and aerodynamic aspects of flying, after which psycho-education is given on anxiety and the role of avoidance. The second day the participants underwent exposure, taking two flights (return) coached by two clinical psychologists. These therapeutic flights were normal commercial flights in Europe with flying time varying between 1 and 2 h per flight.

Control participants were passengers on the same flights as the therapeutic flights in the treatment program. Participants were selected using specific questions (from the MINI) that indicate presence of fear of flying or panic disorder. Individuals were asked whether they had a persistent and exaggerated fear of flying and whether they had experienced panic attacks (using the DSM IV criteria). If individuals answered 'yes' to either of these questions they were excluded from the study. Due to timing constraints we were not able to use the complete MINI in the control sample. However, we excluded individuals with PD, because its specific relationship with AS.

All participants had flown before, but there was a difference in the distribution of the number of flights taken and time since the last flight between the control and the flight phobic group (Table 1). In the flight phobic group a large majority (57.4%) reported having taken between 10 and 50 single flights, and 43.5% indicated having taken their last flight more than 5 years ago. In the control group 32.7% reported having taken more than 100 flights, with 51.1% having taken their last flight taken less than one month ago. Chi square tests for proportions indicated that number of flights were significantly different between both groups, $\chi^2(4, N = 101) = 32.64, p < .001$, the same was true for time since last flight was significantly different, t(63) = 8.17, p < .05, with flight phobics taking their first flight on average at 14.94 years old (SD = 8.08) and controls at 20.26 years old (SD = 9.07).

1.2. Materials

1.2.1. Flight anxiety

The Flight Anxiety Situations Questionnaire (FAS) (Van Gerwen et al., 1999) is a 32-item self-report inventory. Each item is rated on a five-point Likert type scale, ranging from 1 (no anxiety) to 5 (overwhelming anxiety). The questionnaire assesses the intensity of anxiety, experienced in different flight, or flight-related, situations. The FAS consists of three subscales. First, the Anticipatory Flight Anxiety Scale, which contains 12 items that pertain to the anxiety experienced when anticipating a flight. Next, the In-Flight

¹ Although this semi-structured interview is not a validated instrument to diagnose the presence of fear of flying, it contains questions that asses the specific content, focus, onset and development and the severity of the flight phobia based on the DSM IV criteria for fear of flying.

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