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Review

SPECIFIC PHOBIA: A REVIEW OF DSM-IV SPECIFIC PHOBIA AND PRELIMINARY RECOMMENDATIONS FOR DSM-V

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The present review was conducted in order to evaluate the current diagnostic criteria for specific phobia (SP) in light of the empirical evidence gathered since DSM-IV and to propose changes to DSM-V where change is clearly and reliably indicated by the evidence. In response to questions put forth by the DSM-V Anxiety, OC Spectrum, Posttraumatic, and Dissociative Disorder Work Group, four primary areas were determined for this review: the accuracy and utility of the current SP type classification system, the validity of test anxiety as a type of SP, the boundary between agoraphobia and SP, and the reliability and utility of the diagnostic criteria for SP. Developmental issues are addressed within each area. Literature reviews examining academic findings published between 1994 and 2009 were carried out and the results are included herein. The review presents a number of options and preliminary recommendations to be considered for DSM-V. All of these recommendations should be considered tentative as they await the field trials and expert consensus necessary prior to their inclusion in the DSM-V. The present review also reveals a great need for future research in the area of SP and directions for such research is provided. Depression and Anxiety 27:148–167, 2010.

Key words: *specific phobia; DSM; agoraphobia; phobia subtypes*

INTRODUCTION

Specific phobia (SP) is an anxiety disorder classification that represents unreasonable or irrational fear related to a specific object or situation. Originally called simple phobia in DSM-III and DSM-III-R, the name was changed to SP beginning with the DSM-IV. At that time, five types of SP were listed: blood/injection/injury (B-I-I), animal, natural environment, situational, and other. The purpose of this review is to evaluate the diagnostic criteria for SP in light of empirical evidence gathered since DSM-IV, and to propose changes to DSM-V where change is clearly and reliably indicated by the evidence. The review was guided by questions posed in the DSM-IV Sourcebook (Vol. 2), chapter titled "Specific (Simple) Phobia (SP)"[1] and by questions posed by the DSM-V Anxiety, OC Spectrum, Posttraumatic, and Dissociative Disorder Work Group, who commissioned the review. It represents the work of the authors for consideration by the work group. Recommendations provided in this article should be considered preliminary at this time; they do not necessarily reflect the final recommendations or

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decisions for DSM-V, as the DSM-V development process is still ongoing.

The review is divided into four sections: (A) validity and utility of the types of SP, (B) test anxiety as a new type of SP, (C) the boundary between SP and agoraphobia (AG), with specific reference to the question of whether AG is better categorized as a sub-type of SP (see a separate literature review on the topic of AG[2] in this issue), and (D) the diagnostic criteria for SP.

VALIDITY AND UTILITY OF SP TYPES

STATEMENT OF THE ISSUES

The primary issue addressed in this section was the validity and utility of the existing DSM-IV SP types. DSM-IV divides SP into five types: animal type (fear cued by animals or insects), natural environment type (fear cued by an object in the natural environment, such as heights, storms, water, or the dark), B-I-I type (fear cued by seeing blood, injury, or receiving an injection), situational type (fear cued by specific situations such as driving, tunnels, bridges, enclosed places, or flying), and other type (fear cued by other stimuli, such as loud noises and costumed characters as well as situations that could lead to illness, choking, or vomiting). These types were an addition to the DSM-IV criteria, based on a review that indicated significant differences among them in terms of gender distribution, age of onset and other characteristics. However, the types are not a diagnostic feature, but rather the clinician is given the option of specifying the type to accompany the diagnosis of SP. The purpose of the current review is to establish whether the evidence continues to support these types.

SIGNIFICANCE OF THE ISSUES

Designation of type of SP aids research development as well as treatment, especially in the case of B-I-I phobia type which is especially responsive to a treatment that is uniquely tailored to its physiological profile (see below). In addition, type description is consistent with the ICD-10. However, others have questioned the validity and clinical utility of the types,[3] and researchers have not used the terms consistently. Furthermore, inconsistency was even apparent between recommendations from the literature review for DSM-IV and the DSM-IV typology of SPs. Specifically, a recommendation was made to cluster phobias of animals, storms, and water into a natural environment phobia type on the basis of factor analysis loadings, even though DSM-IV criteria distinguish animal phobias from natural environment phobias. Also, the DSM-IV SP review recommended a situational phobia type based on findings from factor analysis of a broad cluster of phobias including height, enclosed places, and public transportation, even though DSM-IV criteria place height phobias with natural environment phobias. The evidence for a B-I-I type was the strongest, and included a distinct physiological response to phobic stimuli (initial accelerated arousal, subsequent decrease in arousal, and fainting), an earlier mean age of onset than animal phobia, and a notable familial aggregation of B-I-I. Thus, it is important to judge whether evidence since the publication of DSM-IV continues to justify the types of SPs.

METHOD OF LITERATURE REVIEW

A search was conducted using PubMed and PsycINFO databases covering 1994–2009. Titles and abstracts were searched using the key words *SP* and *type*, *family*, *comorbidity*, *age*, and *treatment* as well as *simple phobia* and *type*, *family*, *comorbidity*, *age*, and *treatment*. This search yielded a total of 24 relevant papers pertaining to the validity of SP types. These were supplemented by relevant reviews and research articles where appropriate.

RESULTS

Results from the DSM-IV SP review are summarized first before describing the results pertaining to 1994–2009.

Prevalence. *DSM-IV review*: Only B-I-I prevalence rates were reported in the DSM-IV review; they were in the range of 3–4.5%.

Current review: Differences in prevalence rates across phobia types would be one index for typing and thus a full review was conducted. The lifetime prevalence of animal phobia is estimated at being the range of 3.3–7%.[4–8] Animal phobia has been found to be one of the most prevalent types of SP among adults,[5] adolescents,[9] and children.[10] When summing the separate rates for heights phobia, storm phobia, and water phobia, the overall prevalence rate for natural environment phobia is in the range of 8.9–11.6, versus 1.1–5.9% for each separately. Height phobia is the most prevalent natural environment phobia, estimated at 3.1–5.3%.[5–7,11] Water phobia and storm phobia have lower prevalence rates in the range of 2.2–3.4 and 2.0–2.9%, respectively,[5–7] although they are somewhat higher in children and adolescents.[12] Among people with any SP, 50% report having either a fear of animals or a fear of heights.[7]

For situational phobia, the lifetime prevalence rate ranges from 5.2 to 8.4%.[6,7] In terms of particular situational phobias, the lifetime prevalence rates are: flying phobia −2.5 to 2.9%; phobia of enclosed places −3.2 to 3.3%; and driving phobia −0.7%.[6,7] Phobia of being alone is estimated at 2.6%, although it has not previously been identified as a SP type in DSM-IV, and potentially overlaps with separation anxiety disorder, AG, and possibly other anxiety disorders as well. It is one of the more common phobias in children and

adolescents, especially when accompanied by a fear of the dark.[12] Lifetime prevalence rates for B-I-I phobia range from 3.2 to 4.5%.[5–7,13] Individuals in older age groups have lower prevalence of B-I-I phobia than those in younger age groups.[13]

As seen in Tables 1 and 2, prevalence rates were similar between animal phobia and B-I-I phobia, and between natural environment phobia and situational phobia. Similar plots of prevalence over age were found for fear (versus phobia) of snakes, physical injuries, heights, and dental treatment.[11]

There are at least two caveats to the comparison of prevalence rates across SP type. First, rates may differ as a function of gender. For example, Beesdo et al.[14] found higher prevalence of animal phobia (8.7%) than B-I-I phobia (6.4%) and higher prevalence of situational phobia (6.4%) than natural environment phobia (5.3%) in females, but found the opposite relationships in males: higher prevalence of B-I-I phobia (3.9%) than animal phobia (2.1%) and higher prevalence of natural environment phobia (3.2%) than situational phobia (1.6%). Gender is reviewed in more detail below. Second, impairment ratings utilized in the diagnostic criteria for determining the prevalence rates vary across studies.

With those caveats in mind, it is difficult to ascertain whether the observed differences in prevalence rates between animal and natural environment phobia, B-I-I and natural environment phobia, and B-I-I and situational phobia are sufficient to justify the distinguishing of types of SPs. It is also notable that rates of remission do not differ significantly across SP types, at least in women.[15]

Age of onset. *DSM-IV review*: The DSM-IV SP review established that differences existed in age of onset for situational phobia (early to mid twenties), height phobia (late childhood/early adolescence), B-I-I phobia (middle childhood), and animal phobia (early childhood). These differences were used to support the typing of SPs.

Current review: Most age of onset data from the period under review represent retrospective estimation in adult samples; few studies of child/adolescent samples were identified. Consequently, the data currently reviewed are vulnerable to errors in estimation. The average ages of onset as reported in adult studies are as follows: animal phobia, 8–9.2 years old;[6,16] B-I-I phobia, 5.5 (median) to 9.4 years old (mean);[13,16] natural environment phobia, 13.6 years;[16] and situational phobia, 13.4–21.8 years old.[4,16] Of note, studies utilizing young samples (e.g., adolescents or young adults) indicate somewhat earlier onset estimates than in adult samples for some SP types. Specifically, Becker et al.[4] reported a mean age of onset of 6.3 years for animal phobias and 6.5 years for natural environmental phobia. Among adolescents and young adults, Beesdo et al.[14] that 50% of the observed animal and B-I-I phobias had emerged by the age of 5 and 6, respectively.

Situational phobia is more prevalent in older than younger individuals[17] and, as seen above, has a significantly later onset than animal phobia and B-I-I phobia.[6,16] One possible reason is that in order to qualify for driving phobia a person must be old enough to have a driver's license (16 years old). However, even when driving phobia is removed from the situational phobia type, situational phobia still has a significantly later onset than animal phobia and marginally significantly later onset than B-I-I phobia ($P = .06$).[16] These findings are confirmed by age of onset/incidence distribution plots across age in younger samples assessed at multiple waves.[4,8,14] Whereas the core onset/incidence phase for animal and B-I-I phobias is in childhood (before the age of 10), natural environment and particularly situational phobias most likely emerge in late childhood or in adolescence; new onsets in adulthood (after the age of 20) can occur, particularly for situational phobias, but are relatively rare.[14]

As seen in Tables 1 and 2, similarities in age of onset have been found between animal phobia and natural environment phobia, animal phobia and B-I-I phobia, and natural environment phobia and B-I-I. Differences in age of onset were found between animal phobia and situational phobia, as well as between natural environment phobia and B-I-I phobia. There were mixed findings regarding natural environment phobia and situational phobia. The findings generally are consistent with the findings reported in the DM-IV review, and support some distinctions among the types of SPs.

Gender. *DSM-IV review*: The DSM-IV SP review indicated higher rates of females than males for animal phobias (91% female), situational phobias (87–90% female), and the cluster of animal, storm, and water phobias (70% female). Height phobias were more evenly distributed, with 40% male. The results regarding B-I-I phobia were mixed (between 35 and 65% female).

Current review: Overall, women have higher prevalence rates of SP than do men. A study of a large Swedish sample found that 26.5% of all women and 12.4% of all men met criteria for a SP.[17] In terms of types, animal phobia is more prevalent among women (4.3–12.1%) than men (2.7–3.3%).[4,5,17] The same is true for natural environment phobia (men = 3.2%; women = 5.3%.[14] Height phobia was the most common type of SP among men (3.3–6.3%), but the second or third most common type of SP among women (1.6–8.6%).[4,5,14,17] Situational phobia is more prevalent among women (6.4–17.4%) than men (1.6–8.5%).[14,17] Findings regarding the sex ratio of B-I-I phobia have been mixed, with two studies finding higher prevalence in females (female: 4.4–6.4%; male: 1.8–3.9%)[13,14] and another finding no gender differences for prevalence rates.[17]

In sum, animal phobia, natural environment (height) phobia, and situational phobia all show higher

TABLE 1. Clinical features of SP types

	Types			
Phobic features	Animal phobia	Natural environment	Situational phobia	B-I-I phobia
Prevalence	3.3–5.7%	4.9–11.6%	5.2–8.4%	3.2–4.5%
Onset	6.3–9.2 years	6.5–13.6 years	13.4–21.8 years	5.5–9.4 years
Gender ratio	Female > male	Female > male, most common type among males	Female > male	Mixed findings
Impairment			Seeking professional help, medication, interference with daily and social life	
Focus of fear	Disgust, revulsion	Danger of harm	Danger of harm	Physical symptoms (fainting), disgust, revulsion
Physiological fear response	Activation of dorsal anterior cingulated cortex, anterior insula			Vasovagal fainting, activation of bilateral occipito-parietal cortex and thalamus
Comorbidity	Depression	Depression, heights phobia in women → anxiety disorders	Affective disorders, childhood-onset disorders, substance use disorders, panic attacks	Marijuana abuse, depression, panic disorder, OCD, AG, SAD, Among diabetics → peripheral vascular disease, cardiovascular disease
Risk factors	Experiential, genetic			Women, low education

TABLE 2. Similarities and differences of SP types across clinical features

	Types					
Phobic features	Animal versus natural environment phobia	Animal versus situational phobia	Animal versus B-I-I phobia	Natural environment versus situational phobia	Natural environment versus B-I-I phobia	Situational versus B-I-I phobia
Prevalence	–	?	+	+	–	–
Onset	+	–	+	?	+	–
Gender ratio	+	+	?	+	?	?
Focus of fear	–	–	?	+	–	–
Physiological fear response			–		–	–
Impairment	+	–	–	–	–	?
Comorbidity	?	–	–	–	–	–
Risk factors	–	–	–			

+ indicates similarities found between SP types. – indicates differences found between SP types. ? indicates mixed findings regarding similarities/differences found between SP types. Empty box indicates limited research addressing similarities/differences between SP types.

prevalence among women than men whereas the findings regarding B-I-I phobia are mixed. Again, however, absolute differences in proportions across gender should be viewed with caution given the differences in ways of establishing impairment for phobias across studies.

Focus of fear. *DSM-IV review*: The DSM-IV SP review found that the ideational content (i.e., the stated source of concern or worry in relation to the phobic object) in animal phobia was frequently with panicking or losing control. The same was described for driving phobia and B-I-I phobia, but there was no further discussion regarding the remaining SP types.

Current review: Individuals with SP who were seeking treatment were asked "What are you most concerned will happen?" "What thought came to mind?" in relation to their phobic object or situation. Responses were grouped into five categories: (a) fear of danger or harm from the phobic object/situation, (b) fear of being trapped, (c) fear of physical symptoms, (d) other (e.g., disgust), and (e) unable to identify a primary focus of fear. These evaluations indicated that in 50% of

individuals with animal phobia the focus of fear was on internal feelings such as disgust and revulsion, while only 25% of their fears focused on danger or harm, and 0% on physical symptoms. In 82% of people with natural environment phobia and in 54% of people with situational phobia, the focus of fear was on danger or harm. In B-I-I phobia, the focus of fear was mostly on physical symptoms (37%; e.g., fainting) and internal feelings (37%; e.g., disgust, revulsion), but not on danger or harm (10%)[16] In another study of SP types, individuals with B-I-I phobia were found to have the strongest anxiety about physical symptoms relative to other SP types.[3] The concerns of children's phobias are yet to be examined systematically.

These findings are somewhat inconsistent with the DSM-IV review, and yet continue to indicate certain differences across the phobia types in terms of ideational content. The most frequently endorsed ideation for each phobia type was as follows: animal phobia—internal feelings of disgust or revulsion; natural environment and situational phobia—danger or harm; and B-I-I phobia—physical symptoms and internal feelings.

Neurobiology and physiology. *DSM-IV review*: The DSM-IV SP indicated a physiological profile that was unique to B-I-I phobia relative to other phobias, involving initial heart rate acceleration and subsequent deceleration and consequent increased likelihood of fainting. Other phobia types were associated with cardiac acceleration without subsequent deceleration. Also, the rank ordering of anxious symptoms (i.e., chest pain, sweating, trembling, fear of dying, etc.) differed between individuals with B-I-I and other SP types. Finally, individuals with animal phobias endorsed fewer anxious symptoms than individuals with other SP types.

Current review: One of the primary grounds for distinguishing B-I-I phobia from other types of SP is its association with vasovagal fainting. From a large community sample, individuals with B-I-I phobia were found to have significantly higher rates of lifetime history of fainting and seizures than individuals without B-I-I phobia.[13] However, we were unable to locate further psychophysiological studies of B-I-I phobia beyond those reported upon in the DSM-IV review. For other phobias, fear potentiation of startle was greater in individuals fearful of animals and mutilation[18] and spider phobia[19] but we were unable to locate studies that made comparisons across phobias.

In a study of functional neuroanatomy, individuals with spider phobias responded to visual images of their phobic stimulus with significantly increased activation in the dorsal anterior cingulate cortex and anterior insula as compared with those with B-I-I phobias.[20] Conversely, individuals with B-I-I phobia responded to their phobic stimulus with significantly increased activation in the bilateral occipito–parietal cortex and thalamus compared to individuals with spider phobias.[20] While this research suggests neural differences between B-I-I phobia and animal phobia, there is very limited research examining neural differences between other SP types.

Comorbidity. *DSM-IV review*: The DSM-IV SP review found that roughly 50% of patients with B-I-I phobia had at least one additional comorbid phobia. Individuals with choking phobia were reported to commonly have panic disorder, oppositional defiant disorder, and depression. Between 4 and 50% of individuals with situational phobia were found to have panic attacks (PAs). Otherwise, comorbidity patterns for other phobia types were not reviewed.

Current review: Most people (75.8%) with SP have been found to experience multiple phobias during their lifetime.[5,21] In fact, 51.2% of individuals with SPs were found to have 3 or more lifetime specific fears.[21] Both animal phobia (1.6) and height phobia (1.4) have a significant odds ratio with comorbid depression.[22] Among women, height phobia is associated with comorbid anxiety disorders, whereas the other natural environment types, water phobia and storm phobia are tentatively associated with substance use disorders and childhood disorders.[4] In a sample of clinic-referred children and adolescents, youth with natural environment phobias (primarily storms and dark/alone) were found to have more somatic/anxious symptoms and depressive symptoms than youth with animal phobias.[23] Youth with the natural environment type also had higher rates of comorbidity with other anxiety disorders, including generalized anxiety disorder (GAD) and separation anxiety disorder.

Situational phobia has higher rates of comorbid psychopathology than animal and natural environment phobias.[6] Situational phobias are associated with comorbid affective disorders, childhood-onset disorders, and substance use disorders.[4] Fear of enclosed places in particular shows a significant odds ratio with comorbid depression.[22] Also, individuals with situational phobias experience unexpected PAs at a higher rate than people with non-situational phobias.[16]

A large community sample study found that individuals with B-I-I phobia have higher comorbidity rates than non-B-I-I phobic individuals for marijuana abuse, depression, PD, obsessive–compulsive disorder, AG, social phobia, and other SPs.[13] B-I-I phobia also has higher lifetime rates of comorbid psychopathology than animal phobia and natural environment phobia.[6] Findings regarding comparative rates of comorbidity between B-I-I phobia and situational phobia are mixed: B-I-I phobia has higher rates of comorbid lifetime psychopathology than "flying" phobia, but lower rates of comorbid anxiety disorders than phobia of enclosed spaces.

Impairment. *DSM-IV review*: The DSM-IV review found that the impairment associated with B-I-I phobia can be severe, including impaired ability to obtain medical treatment, fear of future pregnancy, and

dropping out of medical school. Impairment in relation to the other types of SPs was not reviewed.

Current review: One study with children and adolescents showed that youth with natural environment phobia reported lower life satisfaction than youth with animal phobia.[23] However, another study with adults showed that whereas both animal phobia and natural environment phobia were associated with impairment as measured by seeking professional help, interference with daily life, and interference with social functioning, situational phobia and B-I-I phobia were found to be more significantly impairing than either animal phobia or natural environment phobia.[6] Still, another study found no differences in impairment among different types of SP (measured by the F-DIPS, Diagnostic Interview for Psychiatric Disorders—Research Version) among different SP types.[4]

Risk factors. *DSM-IV review*: The DSM-IV SP review concluded that probands with animal phobia were likely to have first-degree relatives with animal phobias, probands with situational phobia were likely to have relatives with situational phobias, and probands with B-I-I phobia were likely to have at least one relative with B-I-I phobia. The DSM-IV review also found that the majority of individuals with B-I-I phobia associated the onset of the phobia with a traumatic conditioning experience, or model/observation of another person reacting with anxiety to blood/injury. The onset of choking phobia was found to be typically linked to a traumatic experience involving choking. Means of onset for remaining SP types were not reviewed.

Current review: For the period under review, there is further evidence of familial vulnerability to particular types of phobia. That is, comparisons across highly select samples of parents with isolated phobias indicate that offspring were at increased risk only for the phobic disorder exhibited by the parent [e.g.,[24]]. Also, even within animal phobias, having a mother with snake phobia was found to increase the risk of having snake phobia as compared to having a mother with spider phobia.[25] Familial aggregation can be attributed to both genetic and environmental factors.

A series of studies have examined the genetic factors in SP types utilizing the Virginia Twin Registery and the population-based Virginia Adult Twin Study of Psychiatric and Substance Use Disorders. One study found a substantial, though not complete, overlap in the genetic factors that influence genetic liability for animal phobia and situational phobia, as well as other internalizing disorders.[26] Also, the genetic contribution to animal phobia and situational phobia is distinct from genetic contributions to GAD, panic disorder, AG, and social phobia.[27] When B-I-I phobia was substituted in this analytic model in place of social phobia, B-I-I phobia was closer to AG in terms of genetic risk than to animal phobia and situational phobia. These results suggest genetic risk factors for animal phobia and situational phobia are distinct from other anxiety disorders and B-I-I phobia. Another study found that the genetic factors influencing risk for situational and B-I-I phobias were only moderately correlated between the sexes,[28] which was interpreted as "evidence for a qualitative but not quantitative difference in genetic risk factors,"[p 213[28]]. No evidence was found for either qualitative or quantitative gender differences in genetic liability for animal phobia. Another study found total estimated heritability of 47% for animal phobia, 59% for B-I-I phobia, and 46% for situational phobia.[29] Together, the results from these studies suggest that various genetic factors influence the risk of developing different SP types. However, there is currently insufficient evidence to definitively indicate the exact role played by genetic factors in the etiology of SP types.

Direct traumatic conditioning, vicarious observation (i.e., observing a model respond fearfully or be traumatized), and informational transmission (i.e., conveyance of threatening information) represent the types of individually unique life experiences believed to contribute to SPs.[12,30,31] Laboratory studies that validate these associative learning pathways include many examples of direct aversive conditioning of electrodermal and startle blink response [e.g.,[32]], and vicarious fear acquisition in laboratory-reared rhesus monkeys who, not previously exposed to snakes, observed unrelated, wild-reared monkeys react fearfully in the presence of live and toy snakes [e.g.,[33]]. In addition, the informational transmission pathway has been demonstrated in laboratory studies with children [e.g.,[34,35]]. However, inasmuch as it is unethical to conduct the type of human experimental research necessary to fully demonstrate the causal role of these associative pathways in the development of phobic fear and anxiety, firm evidence is lacking. Instead, self-reported reasons for phobia onset are often presented as evidence for the associative pathways of fear acquisition [e.g.,[36]], although such recollections are fraught with imprecision and unreliability.[37] Nonetheless, one study compared reported etiology across phobia types. Specifically, individuals with snake phobia were more likely to report indirect aversive exposure to snakes (i.e., vicarious observation) than were individuals with spider phobia to spiders, but there were not significant group differences in experience of direct aversive exposure.[25] No other studies comparing etiology across types of SPs were located.

Treatment response. *DSM-IV review*: The DSM-IV SP review found that applied tension is an effective procedure to counteract the deceleration of heart rate and blood pressure in blood phobia. Case studies indicated that choking phobia may be effectively treated through graduated in vivo exposures and by medications that attenuate PAs. The review found insufficient evidence to determine whether treatment response differed in other SP types.

Current review: Results of a review indicated that in vivo exposure (i.e., repeated systematic exposure to the feared object or situation in real life) was an effective form of treatment for most types of SP, with treatment gains maintained for 6 months to 1 year.[38,39] Some differences were found as well across phobia types. One-session treatment, a form of intensive in vivo exposure, was found to be more effective in the treatment of animal phobia than the other types of phobia in children and adolescents.[40] Virtual reality exposure treatment has been found to be effective for flying phobia and height phobia, whereas interoceptive exposure (exposure to feared bodily sensations) and cognitive therapy are particularly effective for treating claustrophobia. Applied muscle tension has been used effectively with B-I-I phobia to prolong exposure and prevent fainting, but has not been studied with other types of SP. However, a meta-analysis that utilized controlled effect sizes and treatment moderator effects in its analysis failed to replicate these findings, and found no differences in treatment outcome based on type of SP.[41]

Dental phobia. The DSM-IV review on SPs did not evaluate dental phobia as a potential SP type. In DSM-IV, dental phobia is considered an invasive medical procedure and therefore part of the B-I-I type. However, some have argued that dental phobia should be listed as a distinct type of SP.[42] Thus, a review was conducted of dental phobia.

The prevalence of dental phobia is in the range of 2.4–3.7%.[7,11] In a large Dutch sample, dental phobia was found to be the most prevalent type of SP,[11] and the authors suggested that the lower rate of dental phobia in other studies may be caused by under-reporting. Prevalence rates for dental fears across age are similar to prevalence rates for fear of snakes, fear of physical injuries, and fear of heights, with stable or increasing prevalence during adulthood, reaching a maximal prevalence at around 60 years old, followed by a decline.[11]

Individuals with dental phobia have decreased likelihood of seeking out dental treatment, and in turn have deteriorating dental health which is worse than those without dental phobia.[11] Also, dental phobia is associated with more intrusive re-experiencing of fear than other phobias, impaired social relationships, sleep disturbance, avoidance of certain foods, negative physiological impact, and decreased vitality.[11,43,44]

Although dental phobia, as an invasive medical procedure, would be considered part of B-I-I phobia in DSM-IV, De Jongh et al.[42] compared features of dental phobia to B-I-I phobia. They noted that although only 56.7% of individuals with dental phobia have injection–injury phobia, those with dental phobia had a significantly higher likelihood of having B-I-I phobia than those without dental phobia. No relationship was found between dental trait anxiety and B-I-I phobia fear or avoidance.[42] Also, they note that high proportions of individuals with dental phobia fear dental procedures involving injury or injections, such as "extractions" (57.5%), or "witnessing surgical operations" (30.8%), and "receiving anesthetic injections" (39.0%), but only a small proportion fear the sight of blood (7.3%). Finally, although individuals with dental phobia were not different from controls in their history of fainting or near fainting experiences, they also did not differ from individuals with B-I-I phobia in this regard.[42] Thus, it appears that dental phobia shares more similarities than differences with B-I-I phobia, and there is insufficient evidence at this time to list dental phobia as its own distinct SP type. On the other hand, it may be helpful to clinicians to reword the diagnostic criteria of the B-I-I Type by parenthesizing the phrase "or other invasive medical procedure" so that instances of dental phobia or phobias of other medical procedures are properly included.

Structure of SP types. Two studies utilizing factor analysis to examine the structure of SP symptoms demonstrated that SP symptoms cluster into the same three types in children, adolescents, and adults: animal phobia, B-I-I phobia, and a combined natural environment–situational phobia.[17,45] Muris et al. also found that a model of the above mentioned three factors loading onto a single higher order factor was an equally good fit as was the three-factor model. Another study that examined comorbidity rates of different SP types with PD with AG (PDA) supported the same three types as the factor analyses. B-I-I phobia was the most closely related to PDA, environmental–situational phobia was related to PDA but less so than was B-I-I phobia, and animal phobia was only minimally related to PDA.[46] Together, these findings support the grouping of natural environment and situational types of SP. Further support for such a grouping is that each represents fear of a particular environment or situation, in contrast to animal phobia and B-I-I phobia which are cued by fears of more discrete stimuli. On the other hand, our review indicates some differences between natural environment and situational types, including features of impairment and comorbidity, albeit based on limited data. Furthermore, in their factor analyses, Wittchen et al.[47] found that animal phobia and natural environment phobia always load on the same factor, regardless of age. In the age range of 22–34 (but not 1–22 years), situational phobia also loaded with animal and natural environment phobia. In contrast, B-I-I phobia was not consistently associated with any one factor; a finding that resonates with its distinctive physiological profile, and supports just two types: B-I-I versus other.

SUMMARY AND PRELIMINARY RECOMMENDATIONS FOR DSM-V

Overall, this review found a number of similarities and differences in the clinical features of SP types (Table 2). Age of onset, gender ratio and

treatment response were the features that were most similar across SP types. Age of onset was highly similar across animal phobia, natural environment phobia, and B-I-I phobia; gender ratio was highly similar across animal phobia, natural environment phobia, and situational phobia; and treatment response is similar across all phobias, although specifics of the way exposure treatment is conducted may vary across types and some minor differences were noted. Focus of fear, physiological fear response, impairment, and comorbidity were the clinical features found to be the most distinct between SP types. In total there are more differences than similarities found between SP types, although there were a number comparisons between particular types that yielded mixed results or for which data were missing. As shown in Table 2, extant data indicate that natural environment phobias share the most in common with other phobias, followed by animal phobia, then situational phobia, and B-I-I phobia sharing the least in common with other phobias. However, analyses of similarities and differences across individual phobias within types (e.g., height phobia versus enclosed places phobia within situational phobias) are very limited and in need of further research. Finally, structural analyses yield mixed findings, with three studies supporting three primary types (animal, B-I-I, and natural environment–situational) and another study providing contrasting results.

The findings of this review support retaining the types of SPs, with a minor change of including a parenthetical phrase "or other invasive medical procedures" following the descriptor B-I-I type. One value of retaining types is to promote further research on each one, which may elucidate further differences in etiology, course, comorbidity, treatment, or so on. Another value is to be consistent with ICD-10, which also offers an "if desired" option of subdividing SPs into types. A caveat, however, is the inconsistency in use of the types in the research literature: some studies ignore the types and study individuals with SP as a homogeneous subgroup; some focus on only one or two of the types as if they are completely separate entities; some select the prototype of the type category (e.g., driving fears for the situational type, snake fears for the animal type) and generalize it to the whole category. Greater consistency is urged.

TEST ANXIETY AS A SP TYPE

STATEMENT OF THE ISSUES

The purpose of this section was to examine the validity of identifying test anxiety as a distinct type of SP. Test anxiety is characterized by extreme fear of poor performance on tests and examinations. Test anxiety is often related to academic underachievement and failure, low self-esteem, dependency, and passivity.

SIGNIFICANCE OF THE ISSUES

Test anxiety is not categorized as a diagnosis in DSM-IV. Yet, test anxiety is a common and often disabling condition. Assignment to a diagnostic category, such as a type of SP, may facilitate its identification and treatment.

METHOD OF LITERATURE REVIEW

Articles on this topic were located via PsycINFO and Pubmed, covering the period 1994 to 2009, using the key words *test anxiety*, *performance anxiety*, and *math anxiety*. In addition, reference lists of the PsycINFO and Pubmed located articles were used to locate other potentially relevant papers. The PsycINFO search yielded over 590 peer-reviewed journal articles, but after closer examination, only 6 papers were included in this review, based on their coverage of topics important to diagnostic criteria, such as prevalence, course, comorbidity, symptomatology, demographic and psychological correlates, and treatment response (other publications addressed issues such as translating test anxiety scales into different languages and examining the impact of test anxiety on performance in special populations such as students with learning disorders). Of the papers selected, five were experimental studies and one was a meta-analysis paper. The studies were: Beidel et al., 1994; King et al., 1995; Warren et al., 1996; Maxfield et al., 2000; Ergene, 2003; and Putwain, 2007.[48–53]

RESULTS

Prevalence. Among youths ($N = 62$; mean age of 10 years) screened by Beidel et al.[48] using the Test Anxiety Scale for Children (TASC), a self-report measure of test anxiety, 38% of White and 52% of African American children scored above the cut-off on the TASC indicative of significant test anxiety (i.e., scoring 16 or above for girls and 12 or above for boys). However, the prevalence of phobias of test taking is difficult to establish as there are several test anxiety measures available and cut-off scores often vary by study. For instance, two other studies included in the review[49,50] also utilized the TASC; however, its cut-off score was operationalized as the top 5% of the distribution of scores, which resulted in a score of 23 and above for girls and 18 and above for boys. Another study[53] used the Test Anxiety Inventory (TAI), but did not establish cut-off scores and examined test anxiety on a continuum instead. In the absence of a predetermined threshold agreed upon by researchers, the variety of instruments and cut-off scores used by researchers makes synthesizing results difficult.

None of the aforementioned studies parsed out the impact of social anxiety (or fear of social situations) from test anxiety, which furthers complicates interpretation of the findings. However, one epidemiology study [Knappe et al., in preparation] reported that

among all subjects ($N = 3,021$, aged 14–24), 28% feared test situations (and other social situations) and 11% feared only tests/exams. Also, among those who met DSM-IV criteria for Social Phobia, 75% feared testing (and other social situations) and 14% feared only test-taking situations but no other social situations. Isolated fear of test-taking was the only "social" fear not associated with the temperament of behavioral inhibition. Thus, despite the significant overlap between test anxiety and social anxiety, these results suggest that they are distinguishable.

There is also some evidence suggesting that test anxiety may be more prevalent and may take on more excessive proportions in cultures in which superior performance on tests is critical to upward mobility from poverty, and thus has high survival value [see[54]]. This has been described in non-western cultures; however, the results are not always consistent.[55] For instance, based on students' score on the TAI, which has been translated and adapted into numerous cross-cultural editions, Korean and Jordan youths, but not Japanese and Turkish youths, reported higher means compared to students from other nations.

Gender. Consistent sex differences in test anxiety levels have been observed on specific test anxiety measures [e.g.,[56,57], Knappe et al. [in preparation]], with women scoring higher than men. A study of 14 to 16–year-old students from northern UK ($N = 1,348$)[53] reported that the gender of the student significantly predicts test anxiety scores as did the smaller study by Warren et al.[50] with 4th, 7th, and 10th grade students in the United States, such that female students reported higher scores than male students on the TAI in both countries. These gender differences have been attributed to females being more willing to report anxiety [e.g.,[58]], and has resulted in the use of different cut-off scores to identify significant levels of test anxiety in men and women.

Age at onset. This question was not addressed in any systematic way in the articles included in this review. However, test anxiety was found to be present in children as young as 10 years old.[48,50] This was confirmed by Knappe et al., [in preparation] who found that, among adolescents and young adults, isolated test anxiety had a mean age of onset of 14.7 years with first cases being elementary school-aged children.

Comorbidity. Two articles included in the review addressed this question. First, Beidel et al.[48] found that 54% of children, with a mean age of 10 years and without comorbid disorders other than anxiety disorders, who were considered test anxious (i.e., using cut-offs on the TASC) met criteria for a DSM-III-R anxiety disorder, as measured by the Anxiety Disorders Interview Schedule for Children (ADIS-C). Social phobia and overanxious disorder were the two most frequently diagnosed disorders ($N = 19$ and $N = 11$, respectively). The high percentage of social phobia and overanxious disorder among test-anxious children is not surprising, because all three share a common core feature: a fear of negative evaluation by others. Other comorbid disorders include Simple Phobia ($N = 5$) and Obsessive–Compulsive Disorder ($N = 1$). Second, King et al.[49] found that 61% of test-anxious 9th and 10th grade students, as indicated by cut-offs on the TASC, also met DSM-III-R criteria for an anxiety or phobic disorder as assessed by semi-structured interviews adapted from the Interview Schedule for Children. The most frequent diagnosis was overanxious disorder, followed by separation anxiety disorder, simple phobia, and avoidant disorder. The least common diagnoses were social phobia and major depressive disorder (MDD). Moreover, more than half of the test-anxious students with an anxiety disorder had multiple diagnoses and all of the test-anxious students with multiple anxiety disorders were girls. However, these results were based on a small (total $N = 47$; high-test-anxious $N = 22$) and potentially biased sample (9th and 10th grade students attending a private Catholic or Jewish school). In summary, these two studies suggest that test anxiety is highly comorbid with overanxious disorder, and in the larger study, social phobia as well.

Physiology. Beidel's study[48] examined the pulse rate and blood pressure of test-anxious and non-test-anxious children prior to and while undergoing two stressful behavioral tasks: taking an age-appropriate vocabulary test and reading aloud before an audience of three young adults. No significant effects for test-anxiety status or task were found.

Risk factors. One study[53] addressed socioeconomic correlates of test anxiety. Data on test anxiety and additional demographic variables were collected via the TAI, a self-report questionnaire that requires a Likert-format response, and the Student Profile Questionnaire in 1,348 14–16 year old in northern UK. Consistent with previous research showing that higher levels of test anxiety are reported by groups from lower socioeconomic backgrounds,[59] students from "routine/manual" socioeconomic backgrounds reported significantly higher test-anxiety scores than students from "managerial/professional" backgrounds based on regression analyses. Nonetheless, the model accounted for a relatively small proportion of the variance in test anxiety scores ($R^2 = .09$), which is not surprising as prior literature suggested that the major determinant of test anxiety is likely to be the previous experience of failure in assessment situations.[60]

Psychological correlates. A study of 9th and 10th grade students examined the psychological correlates of test anxiety[49] as measured by the Fear Survey Schedule for Children-Revised (FSSC-R), Revised Children's Manifest Anxiety Scale (RCMAS), the State-Trait Anxiety Inventory for children (STAIC), the Children's Depression Inventory (CDI), and the Hopelessness scale for Children (HSC). High- and low-test-anxious students were identified by the top 5% and bottom 5% of the distribution of scores on the TASC. On all assessment measures, differences were reported between high-test-anxious and

low-test-anxious students. High-test-anxious students reported greater fearfulness (of failure and criticism) on the FSSC-R and greater amounts of anxiety (i.e., physiological, worry/oversensitivity, and social concern/concentration) on the RCMAS. On the STAIC, high-test-anxious students reported higher scores on the trait subscale but not the state subscale. In line with the strong association between anxiety and depression [e.g.,[61]], high-test-anxious students reported more depression and more hopelessness relative to low-test-anxious students. Similar findings were obtained by Warren et al. with 4th, 7th, and 10th grade students using the TAI. In summary, these findings suggest that high-test-anxious students experience a global state of emotional distress, including fearfulness, general anxiety, and depression. However, it must be noted that the interpretation of the findings of King et al. is limited by a small and potentially biased sample (Jewish and Catholic private school students) and confounded by comorbid Axis I disorders such as separation anxiety disorder, depression, and overanxious disorder. Moreover, the use of an extreme groups design and the total reliance on self-reported measures may raise further questions about the validity of the findings from these two studies.

King et al.[49] also examined the role of dysfunctional thinking in test anxiety. The students were administered a brief but stressful test of mathematical and language skills, followed by the Children's Cognitive Assessment Questionnaire (CCAQ), which consisted of self-statements designed to measure on-task thoughts, off-task thoughts, positive self-evaluation, negative self-evaluation, and coping statements. The high-test-anxious students endorsed significantly more off-task thoughts (e.g., "I wish this were over"), engaged in more negative self-evaluation (e.g., "I am doing poorly on this"), and contrary to expectation, reported more coping self-statements (e.g., "try to relax") than low-test-anxious students. This may be because high-test-anxious students were attempting to cope with the threatening testing situation, whereas low-test-anxious students did not find the situation threatening and therefore did not need to use coping self-statements.

Interestingly, Knappe et al. [in preparation] reported that isolated test anxiety was the only fear under the broader umbrella of social fears that was not associated with behavioral inhibition, as measured by the Retrospective Self-Report of Inhibition, which is a 30-item self-report questionnaire assessing a broad range of childhood behaviors. This suggests that although behavioral inhibition may be a risk factor for conditions that are frequently comorbid with test anxiety, it may not be a risk factor for test anxiety itself.

Treatment response. Test anxiety has been shown to respond well to a number of intervention techniques. In a meta-analysis of interventions for test anxiety published from 1974 to 1998,[52] cognitive restructuring, combined behavioral and skill-focused approaches, cognitive and skill-focused approaches combined, other behavioral techniques, anxiety management training, cognitive–behavioral and skill-focused techniques combined, and systematic desensitization produced large effect sizes greater than 0.90. Interventions that produced medium effect sizes were relaxation training, hypnotherapy, rational-emotive therapy, stress inoculation training, and other skill-focused interventions. However, the results must be interpreted with caution because most of the groups were not homogenous; thus, a significant amount of the variance in those groups remained unexplained. There is also evidence to suggest that a single session of Eye Movement Desensitization and Reprocessing (EMDR) is an effective intervention,[51] although this study suffered from a small sample size ($N = 17$).

SUMMARY AND PRELIMINARY RECOMMENDATIONS FOR DSM-V

Although test anxiety may have clearly identifiable features, its prevalence has yet to be established in community samples, as extant data are limited to cut-offs on self-report scales. Furthermore, more studies are warranted to differentiate test anxiety from social phobia and GAD. There is no evidence to date to suggest that test anxiety is better categorized as a SP than as a manifestation of another anxiety disorder. Thus, the term "test anxiety" may be best retained to describe the anxiety that is experienced across various disorders, in the same way that "illness anxiety" may represent the manifestation of anxiety in the context of a number of anxiety disorders.

THE BOUNDARY BETWEEN SP AND AGORAPHOBIA

STATEMENT OF THE ISSUES

In the DSM-III,[62] AG was classified as an independent anxiety disorder, the major criterion for which was "fear and avoidance of being alone or in public places from which escape might be difficult or help unavailable in case of sudden incapacitations, e.g., crowds, tunnels, bridges, or public transportation" (p 227). After the release of DSM-III, however, research emerged which suggested that AG was not a separate entity but instead a secondary response to panic disorder (PD), such that the fear and avoidance of being alone or in public places from which escape might be difficult was considered to be due primarily to the fear of developing panic-like symptoms. The DSM-III-R[63] subsequently reclassified AG as a sequela of PD, removing AG as an independent classification.

In the years leading up to the publication of the DSM-IV,[64] it became increasingly acknowledged in the field that, while rare, AG did exist in the absence of panic symptoms. Thus, the DSM-IV included three diagnoses related to AG: PD without AG, PD with AG,

and AG without a history of PD. The avoidance that characterized the diagnosis of AG without a history of PD was described as resulting from "fear of incapacitation or humiliation due to unpredictable, sudden, panic-like symptoms rather than from fear of a full panic attack" (p 404).

Since 1994, further data have emerged suggesting that AG frequently occurs in the absence of PD or panic-like symptoms. Additionally, the International Classification of Diseases (World Health Organization, ICD-10) continues to list AG and PD as separate diagnoses that sometimes co-occur, and when they do, the diagnostic coding is AG with PD. Wittchen et al.[2] examined the patterns of DSM-IV PD and AG in a 10-year longitudinal community study of 3,021 subjects. They found that over half of those individuals with AG not only never met criteria for PD, but also failed to meet criteria for even the most liberally defined panic-like symptoms. (Although, it is unclear whether they experienced other symptoms (e.g., visual disturbance) that, like PA symptoms, functioned to motivate avoidance). The authors acknowledge that the presence of PD and panic-like symptoms greatly increases the odds of developing AG, but that it is not a necessary component in the development of AG. Wittchen et al.[2] state that "one immediate and direct interpretation [of these findings] is that AG is an independent phobic disorder in its own right…." (p 154). The findings detailed above are consistent with the review by Wittchen et al. (this issue) of the diagnostic boundary between PD and AG that was also commissioned by the DSM-V workgroup.

It has been hypothesized that AG may be similar enough to other phobias to warrant inclusion in the SP diagnostic classification. Support for this notion has in part developed from research showing that upon clinical reappraisal, some cases of AG without PD represent SPs.[65,66] Wittchen et al.[67] clinically reappraised 242 cases of AG without PD and found that whereas all of the 69 subjects who reported more than one agoraphobic situation fear were correctly diagnosed, 126 of the 173 (72.8%) individuals reporting only one feared agoraphobic situation should actually have been diagnosed with SP. In over half of these reappraised cases, the SP was of the situational type. These findings along with others have led to the suggestion that if only one agoraphobic situation is feared, then it be classified as a situational SP; if more than one agoraphobic situation is feared, then it should be diagnosed as AG. The goal of this review is to evaluate the evidence to support inclusion of AG as a situational type of SP.

Significance of the issues. The issue of how AG fits in to our conceptualization of Axis I psychopathology is not merely a taxonomic one. When AG is predominantly conceptualized with regard to panic symptoms, some individuals with clinically significant psychopathology are unlikely to be diagnosed and treated. Research has demonstrated that AG outside of the panic spectrum has very low rates of remission and a similar pattern of impairment and comorbidity as AG that exists within the panic spectrum, despite the fact that the former group is less likely to contact health professionals or receive treatment.[2] Thus, the reclassification of AG as a disorder independent from PD appears likely to have positive effects on the identification and treatment of the disorder.

SPs tend to be seen as lower in clinical severity and having a more straightforward and effective treatment (i.e., exposure therapy) than other anxiety disorders. Possibly as a result of these views, research on SPs has significantly decreased during the past three decades.[68] Thus, placing AG within SP could potentially have a negative effect on the perceived importance and severity of AG and on the search for ever more effective treatments.

METHOD OF LITERATURE REVIEW

To initiate the literature search, all published articles containing the following terms (or combination of terms) in their title or abstract were retrieved from the PubMed and PsychINFO databases: (1) SP and AG, (2) AG and classification, (3) SP or AG and DSM-V, (4) situational phobia, and (5) simple phobia and AG. A review of the abstracts was then undertaken to remove duplicate articles and determine those articles that appeared particularly relevant to this review. Any publication was reviewed in full if it met the following criteria: (1) was an original research report published between 1994 and 2009; (2) contained subjects who were diagnosed with a screening interview based on the DSM-III-R or DSM-IV criteria for SP, simple phobia, AG, or PD with AG; and (3) examined any issue relevant to how AG is similar or dissimilar from SPs. A close look at the DSM-III-R and DSM-IV criteria shows that little changed with regards to the diagnosis of the SPs and AG. Thus, studies utilizing either DSM-III-R or DSM-IV criteria were included. Studies utilizing the ICD-10 criteria for research were also eligible for inclusion.

RESULTS

A total of 32 publications (30 empirical investigations, 2 review/theoretical papers) met the criteria for this literature search. No studies were found in the literature search that solely used the ICD-10 criteria for AG or SP. Two key issues with regard to the state of the literature arose during this investigation, each of which contributes to the lack of consensus in the field regarding this issue. First, consistent with the report by Boschen,[68] which stated that SP and AG are the only two anxiety disorders to see a decrease in research occur between 1980 and 2005, publications on AG and SPs are dwarfed in number by those of the other anxiety disorders. A second key issue is the inconsistency in the measurement of SP and AG. The majority of studies undertaken in the last 15 years only

study AG in the context of PD, making it impossible to tease apart the effects of the AG from comorbid PD, which is complicated by the fact that AG also is defined by multiple types (e.g., AG with PD, AG without a history of PD, AG with PAs), and the large variation in how investigators study individuals with SP.

Etiological and pathogenic issues in the SP/AG boundary. Three studies examined the neurobiology of phobic disorders within the last 15 years. Samochowiec et al.[69] examined functional polymorphisms in the MAO-A, COMT- and 5HTT genes in 101 anxiety disordered patients and 202 healthy controls. No differences were found between prevalence rates of 5-HTT and COMT gene polymorphisms in the two groups, but individuals with AG (diagnosed separately from PAs) and SP had a significantly higher frequency of the MAO-A polymorphism than individuals with social anxiety disorder (SAD) or healthy controls. However, this result was also found for PD and GAD and likely speaks to the role of MAO-A polymorphism as a general risk for anxiety disorders as opposed to a link between AG and SP at the neurobiological level.

The other two studies also failed to provide conclusive information regarding a link between AG and SP. Roberts et al.[70] examined the prevalence of anxiety disorders in 93 women from the National Comorbidity Survey (NCS) Replication who had Fragile X Syndrome, demonstrated in previous research to be linked to higher rates of psychopathology. Women with the FMR1 premutation had a substantially reduced risk of being diagnosed with GAD, posttraumatic stress disorder (PTSD), SAD, and SP, but a four-fold increase in the likelihood of being diagnosed with AG (without PD) and PD (with or without AG). Although this supports a separation between SP and AG, the study was grossly underpowered. Clearly there is need for more replication in larger studies.

From their review of neuroimaging research and anxiety disorders, Damsa et al.[71] noted that multiple studies have supported the role of the amygdala and the anterior cingulated cortex in both AG and SP. However, the role of these brain structures was not unique to AG and SP and none of the neuroimaging studies cited in the review measured AG independently of PD.

Four studies utilized family studies to examine questions relating to the heritability of AG and SP. Fyer et al.[24] identified probands for three phobic disorders (SAD, SP, and AG with PAs) and compared the rates of phobic disorder diagnoses in their first-degree relatives with each other and with first-degree relatives of a healthy proband group. Probands with each of the phobic disorders were two- to four-times more likely to have first-degree relatives with the disorder than individuals without that phobic disorder. Thus, the notion of AG being genetically distinct from SPs and SAD was supported by this study. However, the individuals with AG in the sample all had comorbid PAs, making interpretation difficult. The three other family based studies utilized twin registries to examine issues of heritability in AG and SP. Kendler et al.[29] reported that between 46 and 67% of the variance in twin resemblance was due to genetic factors, with the rest mostly being accounted for by individual-specific (not familial) environmental factors. AG (unclear if with or without PD) had a substantially higher genetic heritability rate than SAD or the types of SP, suggesting an etiological differentiation between AG and SP. Hettema et al.[27] found that genes predispose to two broad groups of disorders: GAD-PD-AG (diagnosed independently of PD) and SPs. Additionally, they noted that differences between AG and SP were especially pronounced for the situational and animal types, which is surprising given the hypothesized link between situational SP and AG. However, the operational definitions for GAD and PD were considerably more liberal than the ones in DSM-IV. In a follow-up study,[26] nearly one-half of the genetic risk across MDD, PD, GAD, SAD, AG, social phobia, neuroticism, and two SP types (animal and situational) was accounted for by neuroticism and individual-specific environmental correlations were much lower. Nonetheless, a second, neuroticism-independent genetic factor significantly increased risk for MDD, GAD, and PD, but not for SP or AG. Thus, whereas their initial study provided some evidence for different genetic architecture underlying AG and SP, their follow-up study suggested a certain degree of similarity in that neither were linked with an additional neuroticism-independent genetic factor that contributed to the increased risk of the non-phobic disorders.

The role of early predictors in the development of AG and SP was examined in four studies. Biederman et al.[72] assessed the developmental trajectory of 157 children at high risk for developing psychopathology due to parental MDD and/or GAD compared to 76 children whose parents were free of psychopathology at intake. Their results suggested that childhood separation anxiety disorder significantly increases the risk of later AG (diagnosed independently of PD) and SP, although this finding was not unique and was applicable to all of the anxiety disorders. The only unique finding for the disorders at hand was that pediatric AG uniquely predicted the development of GAD, although the authors warn that this should be interpreted with caution. Nearly identical findings were found by Bruckl et al.[73] who reported that childhood separation anxiety was associated with and predicted PD with or without AG and SP, but was not associated with or predicted AG without PD among 1,090 German adolescents followed for 4 years. A similar study was conducted by Goodwin and Gotlib[74] examining the role of PAs in psychopathology. The presence of PAs in a community sample of 1,285 was associated with a three-fold increase in the presence of AG and SP, but this was true of other anxiety disorders as well.

Of note, however, a similar analysis conducted by Goodwin et al.[75] found that while PAs were associated with both SP and AG in cross-sectional and prospective analyses, the relationship between PAs and AG was reduced to non-significance when adjusting for age, gender, and comorbid conditions.

Goodwin et al.[76] showed that early anxious withdrawn behavior at age 8 predicted later SP but not PD/AG when adjusting for childhood, social, and family factors. Other early risk factors were examined in a German sample of 3,021 adolescents and young adults.[77] Some common and some differential associations emerged for AG (with or without panic) and SP: while parental anxiety disorder and an anxious temperament (behavioral inhibition) predicted both AG and SP, poor educational attainment and early separation events were associated with AG but not SP, and parental alcohol use disorders were associated with SP but not AG after adjusting for comorbid depression.[77]

Another study showed that early life experiences differentially predicted the onset of AG and SP.[78] A subsample of 5,877 individuals aged 15–54 who participated in the NCS were followed up with an interview assessing current DSM-III-R phobic disorders and retrospective recall of the experience of 12 types of negative life events and 10 chronic childhood adversities. The results suggested that different early life experiences predicted the onset of AG (with or without PD) versus SP, such that unpredictable and uncontrollable events that threaten or result in physical harm (e.g., natural disaster, accident, war) influence AG onset whereas potentially predictable but difficult to control childhood experiences (e.g., parental violence) influence SP onset. However, the results should be interpreted with caution given the combination of AG with or without PD, the problems of recall bias, the lack of replication of these findings, and the subjective manner in which stressors were interpreted with regards to their predictability and controllability. In an earlier study using the same sample, Kessler et al.[79] found additional evidence for differential predictors: absence from parents for more than 6 months (after controlling for other prior adversities and prior other disorders) was associated with an increased risk for SP but not AG or any other anxiety, mood, addictive, or antisocial behavior disorder. Maternal depression and maternal GAD also were associated with onset of SP but not AG, although maternal depression was associated with onset of PD. Finally, consistent with Magee,[78] paternal aggression was associated with SP but not AG.

Starcevic and Bogojevic[46] examined the temporal distance of AG (PD with AG) onset with SP onset in 90 comorbid patients, guided by the hypothesis that short temporal distance between two disorders reflects etiological relatedness. Their results indicated that SPs almost always preceded AG onset and that death-related phobia (a type not included in the DSM-IV) strongly related to the onset of AG, that B-I-I phobia and situational phobias were moderately related to AG onset, and that the relationship of animal phobia to AG onset was negligible. This study demonstrates high relatedness between AG and SP, but it has several limitations. It did not adhere to the DSM-IV types for SP, it only evaluated AG with comorbid PD, and the evidence for temporal distance reflecting etiological relatedness is questionable.

Summary of etiological evidence: Results of the three neurobiology studies were inconclusive. Despite some inconsistency, the four heritability studies generally support the notion that AG and SP are distinct entities. Evidence linking early life experience to later onset of AG and SP was inconclusive. A study of temporal distance in the onset of comorbid SPs and AG suggested a good deal of relatedness but was limited methodologically.

Epidemiological issues in the SP/AG boundary. Two studies utilized factor analysis to assess the hierarchical structure of fears in large samples. Cox et al.[80] used data from the NCS and examined the endorsement of 19 different fear types in 8,098 individuals. Exploratory and confirmatory factor analyses suggested a model that included three superfactors: social fears (composed of speaking fears and fears of being observed), specific fears (composed of threat fears and fears of heights and water), and agoraphobic fears. A similar conclusion was reached by Beck et al.[81] using the Fear Survey Schedule-III in patients with PD (with and without AG), GAD, SAD, OCD, PTSD, SP, AG (without panic), and anxiety disorder NOS, albeit in a small sample (total $n = 263$). They identified four underlying factors: social fears, agoraphobic fears, animal/insect fears, and blood/injury fears, which is consistent with the seminal study by Arrindell et al.[82] In a later study, Arrindell et al.[83] examined the Fear Survey Schedule-III in 5,427 students; the results supported the presence and gender distribution of the four underlying factors (plus an additional underlying factor of fears of sexual and aggressive scenes) across all 11 nations. While these studies did not include all possible fears and only analyzed endorsement of fears (versus the clinical significance of the fears), they provide compelling evidence for separate factors of AG, SAD, and SP.

Gender ratios have been reported as differing between AG without PD (4:1 female to male) and SP (2:1 female to male),[84] although as reviewed above, gender rates differ somewhat across types of SPs.

Aspects relating to comorbidity in AG and SP were examined in six studies. Two examined the relationship between phobic disorders and MDD, but reached opposite conclusions. Tsuchiya et al.[85]'s study of a community sample of 2,436 Japanese individuals found that AG without PD and SP were not significantly associated with MDD after adjusting for several sociodemographic factors, whereas SAD was. Alternatively,

Goodwin[86] examined data from 15,849 individuals from the Epidemiologic Catchment Area (ECA) survey found that SP and AG without PD each was independently associated with the onset of MDD after adjusting for sociodemographic variables and psychiatric comorbidity. Notably, while these studies reached different conclusions, neither provided evidence for a distinction between AG and SP with regard to their relationship to MDD. However, AG but not SP predicted depression onset when controlling for comorbid anxiety disorders.[87]

Magee et al.[88] examined prevalence and comorbidity of phobic disorders using data from the NCS. They concluded that lifetime and 30 day prevalence estimates were 6.7/2.3% for AG (with and without PD), 11.3/5.5% for SP, and 13.3/4.5% for SAD. Consistent with prior research, they found that the median age of onset in SP and SAD (15 and 16 years of age, respectively) was significantly earlier than that of AG (29 years of age). A significantly later age of onset similar to that for AG was found for the situational type of SP in an investigation by Lipsitz et al.[16] which also suggested that rates of unexpected PAs (a common feature in AG) were highest in the situational type than in any other type of SP.

Two other studies examining comorbidity had less informative findings. Goisman et al.[89] examined longitudinal data from 711 patients with one or more anxiety disorders and concluded that the anxiety disorders are highly comorbid, especially AG without PD, SAD, and GAD, but found no evidence for a uniquely high rate of comorbidity between AG without PD and SP, as might be expected if they are similar phenomena [within SPs, 76% of individuals meet criteria for more than one SP, 5]. Starcevic et al.[90] investigated Axis I and Axis II comorbidity in 157 patients with PD with AG. The authors found a statistically significant increase in SP comorbidity in the females in their sample compared to males and compared to all other Axis I and Axis II disorders in females. However, the authors state that these findings are inconsistent with previous research and likely not indicative of a true difference. Additionally, even though all of the patients had to have AG to be included in the study, the presence of PD makes interpretation difficult.

Summary of epidemiological evidence: Proportionately more females than males meet criteria for AG without PD versus SP. Studies examining the comorbidity of AG and SP failed to show significant or consistent findings. Two-factor analyses found that agoraphobic fears were distinct from both the social fears that comprise SAD and the fears that comprise SP. Emmelkamp and Wittchen[91] concluded that "the delineation of SPs from partly overlapping symptom clusters in social phobia and AG has not been sufficiently addressed to provide guidance as to how to solve this frequent differential diagnostic problem" (p 101–102).

Clinical features. Two studies assessed quality of life and functional impairments in AG and SP. In their validation of the Work and Social Adjustment Scale in 205 individuals with phobic disorders, Mataix-Cols et al.[92] found that impairment was significantly higher for individuals with AG (unclear if with or without PD) and SAD than those with SPs (a mean difference of 8 points out of 40). In contrast, Cramer et al.[93]'s examination of seven indices of quality of life factors in 2,065 Norwegians found that AG (independent of PD) and SP (along with OCD) showed no major reduction in quality of life compared to healthy controls, whereas individuals with other Axis I disorders did. However, this finding is inconsistent with the majority of previous research on quality of life factors in the phobic disorders and should be interpreted with caution.

The relationship between a variety of behaviors, traits, and conditions in individuals with AG and SP were examined in seven studies. Three studies examined issues relating to physical health and the phobic disorders. Utilizing data from the NCS, Sareen et al.[94] found that whereas AG with or without PD was associated with the increased presence of specific physical disorders (most notably cardiovascular conditions), SP was not. However, results of this study should be interpreted with caution due Type I error from failure to correct for multiple comparisons. Sareen et al.[95] conducted a follow-up study using data from the NCS and the Ontario Health Survey (OHS) to examine use of illicit drugs: each anxiety disorder diagnosis was related to illicit drug use after controlling for sociodemographic variables, with no differential effects for AG with or without PD and SP. Goodwin[86] also utilized data from the NCS to examine the relationship between physical activity and the anxiety disorders. Similar to the pattern found by Sareen et al.[95] diagnosis with any anxiety disorder was significantly associated with a decrease in physical activity, with no unique effects of AG and SP present.

The manifestation of fear in individuals with AG (unclear if with or without PD) and SP was examined by Chen et al.[96] in a sample of 609 individuals from the NCS who experienced PAs. The results suggested that while the presence of fearful and non-fearful PAs (defined as PAs that do versus do not meet the DSM-IV criteria but do not include the presence of a fear of dying, fear of going crazy, or fear of doing something uncontrolled) are relatively evenly distributed in the majority of Axis I disorders, individuals with AG, SP, and MDD are significantly more likely to experience fearful PAs. However, differences in the proportions of fearful PAs between disorders was not examined in this study and as a result, the magnitude of the elevation of the percentage of fearful PAs in AG and SP cannot be assumed to be equal in size.

The relationship between the five-factor model of personality traits and anxiety disorders was examined by Bienvenu et al.[97] Using the ECA follow-up

study dataset, 333 adults with SP, AG, PD, MDD, alcohol use disorders, cognitive impairment, and OCD were administered the NEO-PI-R and their endorsement of a variety of personality traits was examined. Individuals with AG endorsed abnormally high levels of neuroticism and introversion whereas individuals with SP were slightly elevated compared to the healthy controls on most measures, but still within the normal range.

Responses to hyperventilation and CO_2 inhalation were examined in 90 participants (15 with each of the four main SP types, 15 with PD with or without AG, and 15 without any diagnosis) by Antony et al.[98] Individuals with driving phobia (a situational phobia) and height phobia (a natural environment phobia) were comparable to the PD with or without AG group. Also, subjective physiological response, age of onset, etiology, predictability, focus of apprehension, and interoceptive anxiety were examined in the four types of SP.[3] The natural environment phobia subgroup, not the situational phobia subgroup, was the most comparable to the features associated with AG, thus suggesting that AG is not a variant of a situational SP. A variety of limitations preclude the application of this data to the present issue, however, including the selection of proto-types for the SPs, the lack of AG without PD as a subgroup, and the small sample size.

Summary of evidence from clinical features: Two studies of impairment in AG and SP found inconsistent results. Of the three studies of physical health correlates, only one found a significant discrepancy between the two disorders. Individuals with AG and SP differ from individuals with other anxiety disorders in their proportionally higher experience of fearful PAs. Individuals with AG are further outside the normal range on two key indicators of personality, while individuals with SP were within the normal range. Finally, two studies of different SP types were inconsistent regarding which SP type has clinical features most similar to those of AG.

Treatment issues in the SP/AG boundary. The present literature search produced no articles that examined treatment for SP versus AG published between 1994 and early 2009. While it is possible that this is accounted for by the previously noted decline in research and the high quality of the established treatments for the two disorders, this is likely to be heavily influenced by the current taxonomic system in the DSM, which considers AG (and its treatment) largely within the context of PD

DISCUSSION AND PRELIMINARY RECOMMENDATIONS FOR DSM-V

The twelve publications that reported etiological evidence related to AG and SP were generally inconclusive, although there were several studies that to a certain degree suggested that AG and SP were distinct entities. Five of the nine publications reporting epidemiological evidence supported the notion that AG and SP should be distinct categories as well. Of the nine publications examining clinical features of AG and SP, most were inconclusive but three provided support for a separation of AG and SP in the DSM-V. Data from treatment trials were not informative. The preponderance of evidence in the field suggests that AG can exist independently of PAs and as such there is a push for AG to be removed from its nearly exclusive association with PD in the DSM-V. However, evidence for AG to be a SP type, or as part of the situational type, is lacking.

SP DIAGNOSTIC CRITERIA

Using fully structured interviews (e.g., CIDI), test–retest reliabilities (approximately 38 days apart) for any SP in a sample of community respondents with some degree of symptomatology was very high ($\kappa = 0.77$).[99] Using a semi-structured interview (i.e., ADIS) in a patient sample, the principal diagnoses (i.e., the most distressing and interfering) of SP showed very good inter-rater reliability ($\kappa = 0.86$), as did SP types (κs = 0.80–1.0).[100] These rates represented an improvement on inter-rater reliability in comparison to DSM-III-R.[101] However, reliability decreased as SPs that were additional (versus principal) diagnoses were included in the analyses: overall $\kappa = 0.71$; sub-type κs = 0.53–0.96. The most common reason (62%) for disagreement between raters was diagnostic thresholds, or the assignment of sufficient impairment and distress to warrant a diagnosis (additional diagnoses were more vulnerable to this source of disagreement than were principal diagnoses). Other sources of disagreement may pertain to lack of clarity in terminology of the diagnostic criteria. For example, terms "excessive or unreasonable," "marked," or "persistent" are not operationalized and may be open to varied interpretation; something that has relevance across the anxiety disorders.

In line with attempts to clarify diagnostic criteria to facilitate reliability and validity, and to simplify and introduce more consistency across the anxiety disorders for purposes of clinical utility, the following changes are proposed for the specific wording of the DSM-IV-TR diagnostic criteria for SP (DSM-IV criteria are presented in Table 3).

First, it is recommended that Criterion A refers to "Marked [intense] fear of a specific object or situation (e.g., flying, heights, animals, receiving an injection, seeing blood)." This recommendation operationalizes the term "marked" as "intense," and deletes the descriptor "persistent" (which is vague). Second, it is recommended that Criterion B is "The phobic object or situation almost invariably provokes an immediate fear response. *Note*: In children, the fear may be expressed by crying, tantrums, freezing, or clinging." In this recommendation, the term "object or situation" replaces the DSM-IV term "stimulus" to be consistent with Criterion A. Similarly, the term "fear" replaces the DSM-IV-TR term "anxiety"

TABLE 3. DSM-IV-TR specific phobia

A: Marked and persistent fear that is excessive or unreasonable, cued by the presence or anticipation of a specific object or situation (e.g., flying, heights, animals, receiving an injection, seeing blood)
B: Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response, which may take the form of a situationally bound or situationally predisposed panic attack. Note: In children, the anxiety may be expressed by crying, tantrums, freezing, or clinging
C: The person recognizes that the fear is excessive or unreasonable. Note: In children, this feature may be absent
D: The phobic situation(s) is avoided or else is endured with intense anxiety or distress
E: The avoidance, anxious anticipation or distress in the feared situation(s) interferes significantly with the person's normal routine, occupational (or academic functioning), or social activities or relationships, or there is marked distress about having the phobia
F: In individuals under 18 years of age, the duration is at least six months
G: The anxiety, panic attacks, or phobic avoidance associated with the specific object or situation are not better accounted for by another mental disorder, such as obsessive–compulsive disorder (e.g., fear of dirt in someone with an obsession about contamination), posttraumatic stress disorder (e.g., avoidance of stimuli associated with a severe stressor), separation anxiety disorder (e.g., avoidance of school), social phobia (e.g., avoidance of social situations because of fear of embarrassment), panic disorder with agoraphobia, or agoraphobia without history of panic disorder

to be consistent with Criterion A. Also, the term "fear" is more suitable than "anxiety" for SPs given the evidence that SPs are characterized by an elevated acute fear response to phobic stimuli in contrast to elevated anxious anticipation that is more characteristic of the other anxiety disorders.[102]

Next it is proposed that Criterion C states that "the phobic object or situation is actively avoided or endured with intense fear" (formerly criterion D). This restructuring is recommended to provide consistency with the structure of other anxiety disorder diagnoses. Also, again, the term "object or situation" replaces the DSM-IV-TR term "stimulus" to be consistent with Criteria A and B. Similarly, the term "fear" replaces the DSM-IV-TR term "anxiety or distress" to be consistent with Criterion A, B, and C, and because the term "distress" is vague and may lower the severity threshold. The term "actively" is added to raise the diagnostic threshold, which will be particularly important should the disorder-specific impairment and distress criterion be deleted (see below).

The recommended new Criterion D is "The fear is out of proportion with the actual danger posed by the specific object or situation." The intent of this recommendation is to first operationalize what is meant by "excessive or unreasonable," as a fear that is out of proportion with the danger posed by the situation. In addition, it is recommended that the designation of "out of proportion" is a clinician-judgment rather than self-judgment. This recommendation is based on evidence for elderly individuals with phobias to be frequently under-diagnosed due to over-attribution of their own fears to age-related constraints.[103] Also, clinical experience suggests that some individuals are judged by diagnosticians to exhibit excessive or unreasonable fears even though the individuals themselves would deny that that their fear is excessive or unreasonable. As already noted in DSM-IV-TR, the self-recognition criterion is not necessary in children. Most young children, perhaps due to developing cognitive capacities, believe their fears and phobias are "real," very much warranted, and not at all unreasonable.[12] Field testing is warranted to establish the effects of this proposed change.

Some changes are being considered in relation to the duration of the disorder and functional impairment. In DSM-IV-TR, Criterion E states that "the fear and/or avoidance interfere significantly with the person's normal routine, occupational (or academic) functioning, or social activities and relationships, or there is marked distress about having the phobia." DSM-V workgroups have been asked to consider the implications of deleting functional impairment from disorder-specific diagnostic criteria. Deletion of the impairment criterion from SP may artificially inflate rates for SP because a number of circumscribed objects or situations are feared and/or avoided with limited to no consequences to overall functioning or disability. This may be especially so for children and adolescents for whom fears are part of normal development. Only when they occur frequently, are intense, and durable over time do they become problematic. This characteristic of highly circumscribed and less persistent fears likely explains some of the disagreements over diagnostic threshold described above.[100] As a consequence, deletion of the impairment criterion might improve diagnostic reliability, but perhaps at the expense of validity.

Not only do children and adolescents have normal developmental fears, but adults may have fears of specific objects or situations but which have limited impact on functioning. These occur in a number of ways. First are feared and avoided circumscribed objects or situations that are unimportant to the individual (i.e., no need or preference to encounter the objects or situations) and therefore have little to no impact on daily lives. For example, a person may fear and avoid airplane travel if the opportunity for air travel arose, but since there is no need or preference and therefore no opportunity for air travel, there is little to no impact on daily life. Second are feared and avoided objects or situations that occur so infrequently that they confer little to no impact on daily lives. For example, a person may fear and avoid snakes but by growing up and living in a city, there is little to no impact on daily life. Third is daily fear and/or avoidance of circumscribed objects or situations that can be accommodated and therefore confer little to no impact on daily lives. For example, a person may fear and/or avoid crossing bridges but has found ways of traveling that successfully avoids bridges

(e.g., tunnels) and does not interfere with other aspects of their daily functioning.

Thus, for both youths and adults, deleting the requirement of functional impairment may raise the prevalence of SPs. However, making explicit that the diagnosis is dependent on the expression of fear and/or avoidance that is not only intense but also active (as proposed for Criterion A and C) and that it is durable over time may offset this diagnostic inflation. Secondary data analysis or field testing may evaluate the degree to which external validators (e.g., health care utilization, comorbidity) and severity of fear and/or avoidance vary as a function of number of months over which the problem has persisted both for youth and adults, and therefore provide guidance for the critical duration cut-off. Such data analyses would be best conducted in epidemiological or non-treatment seeking samples, since those seeking treatment typically seek treatment years after suffering their phobia. It is simply noted here that 6 months for an individual under 18 can be a very long time and the absence of any duration criterion for individual over 18 can either be a very short time or in the least lead to a lack of reliability and validity in diagnosis. It is unclear at this time whether duration should differ for individuals under 18 or over 18.

With the requirement of intense, active and durable fears, normal developmental fears, as well as the person who fears and/or avoids "unimportant" objects or situations (the first scenario described above) and the person who fears and/or avoids "infrequent" objects or situations (the second scenario described above) would not qualify for the diagnosis. Only the person who has successfully accommodated to their fear and/or avoidance (the third scenario) would still qualify for the diagnosis of SP.

A disadvantage of requiring intense, active, and durable expression of fear and/or avoidance is lack of detection of SPs that have remitted, an issue that is of special relevance to epidemiological studies. Thus, criteria may need to be established for when the diagnosis is current versus in remission.

Finally, rewording of the DSM-IV Criterion G is proposed as "The fear and/or avoidance associated with the circumscribed object or situation is not restricted to another mental disorder….." These slight changes are recommended to increase consistency in terminology used across the criteria for SP, across the exclusionary criteria for other anxiety disorders, with further changes pending further decisions regarding exclusionary criteria for DSM V.

OVERALL SUMMARY AND PRELIMINARY RECOMMENDATIONS FOR DSM-V

The present review was conducted to evaluate the current diagnostic criteria for SP in light of the empirical evidence gathered since DSM-IV and to propose changes to DSM-V where change is clearly and reliably indicated by the evidence. In response to questions posed in the DSM-IV Sourcebook (Vol. 2) and by the DSM-V Anxiety, OC Spectrum, Posttraumatic, and Dissociative Disorder Work Group, four primary areas were determined for this review: the accuracy and utility of the current SP type classification system, the validity of test anxiety as a type of SP, the boundary between SP and AG, and the reliability, validity, and utility of the SP criteria. Literature reviews were carried out by the authors and preliminary recommendations have been made to guide the DSM-V Anxiety, OC Spectrum, Posttraumatic, and Dissociative Disorder Work Group as they continue to develop the criteria for SP that will be utilized in the DSM-V. The literature reviews generally resulted in manuscripts that were small in number (consistent with a decrease in research on SP over the past two decades) and often lacking in consistent and rigorous methodology (e.g., the use of heterogeneously defined, non-clinical phobic samples), providing clear evidence of the need for an increase in the quantity and quality of research being conducted on SP. The findings indicate more differences than similarities across the types of SPs, and support retention of the types as a descriptive option, although more research is needed on the heterogeneity within versus between types, and greater consistency is encouraged in SP typologies in research. There is a dearth of research on test anxiety (especially research that looks at it independently from any generalized or social anxiety) and as such little evidence either for or against the inclusion of test anxiety as a SP type is available. The literature regarding the boundary between SP and AG failed to provide consistent evidence for the inclusion of AG as a type of SP. Revised criteria for SP are presented in an attempt to incorporate developmental considerations and to increase reliability and improve clarity and consistency with the diagnostic criteria of the other anxiety disorders. The recommendations herein should be considered preliminary, however, as further discussion and research will be required before a valid consensus can be reached for the DSM-V.

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