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Peer-Reviewed Letter

SCORING ERROR OF SOCIAL AVOIDANCE AND DISTRESS SCALE AND ITS PSYCHOMETRIC IMPLICATIONS

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An error in the scoring instructions of the Social Avoidance and Distress Scale (SAD), one of the most popular instruments to measure social anxiety, is discussed. Depression and Anxiety 19:197–198, 2004. © 2004 Wiley-Liss, Inc.

Research on social anxiety and social phobia has grown dramatically in recent years. As a result, instruments to measure the severity of social anxiety have been increasingly in demand. Two of the first and most popular instruments to measure social anxiety are the Fear of Negative Evaluation Scale (FNE) and the Social Avoidance and Distress Scale (SAD), which were published in the same article in 1969 by Watson and Friend. A literature search using the Web of Science database by the Institute of Scientific Information showed that Watson and Friend's paper has been cited more than 900 times. The FNE and SAD consist of 28 and 30 true–false items, respectively. Although the original paper described two subscales of the SAD (social avoidance and social distress), these are rarely used in practice. It is considerably more common to simply report a total sum score. Half of the items of the (corrected) instrument are reversed scored. Watson and Friend reported data supporting the test–retest reliability and concurrent validity of the both instruments. In addition, SAD scores have been found to be related to global ratings of social skills obtained from peers and to specific behavioral measures of social skills, including gaze time, speech latency, and number of spoken words [Arkowitz et al., 1975].

We recently noticed that the scoring instructions in the original publication of the SAD are in error. Specifically, in Table 1 of the original article by Watson and Friend [1969], Item 19 (“When my superiors want to talk with me, I talk willingly”) was incorrectly keyed “true” (p. 450). Thus, if participants respond with “true” to this item, one point is added to their total SAD score, inappropriately indicating higher levels of social anxiety. To our knowledge, no erratum has been published acknowledging this scoring error. It is uncertain whether researchers who have used this scale detected this error and how much effect this error may have had on published data.

To examine the likely implications of this scoring error, we examined its effects on the psychometric properties of the scale in a group of 199 female college students (Study 1) and 106 individuals with a principal

Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) diagnosis of social phobia (Study 2). For the purpose of these studies, the SAD was scored in two different ways. First, Item 19 was scored positively as incorrectly stated in the original manuscript (SAD_{UNCOR}). Second, Item 19 was correctly (negatively) scored (SAD_{CORR}).

As part of Study 1, we recruited 199 participants from a Northeastern women's liberal arts college (Smith College, Northampton, Massachusetts) to participate in a questionnaire study. Participants were between the ages of 17 and 46 [mean = 18.6; *sd* = 3.52] and mostly Caucasian (76.0%). The result of a paired *t* test (two-tailed) indicated that the mean score of SAD_{UNCOR} was higher (mean = 8.88; *sd* = 6.11) than the mean score of SAD_{CORR}, (mean = 8.06; *sd* = 6.27, *t* (198) = 20.09, *P* < .0001). Furthermore, SAD_{UNCOR} showed a higher median (7 vs. 6) and mode (6 vs. 5) than SAD_{CORR}. The Wilcoxon signed ranks test was statistically significant, *Z* (199) = 11.56, *P* < .0001 (two-tailed). The difference between SAD_{UNCOR} and SAD_{CORR} in the means for this group was 10.2% (8.88–8.06/8.06). The standardized Cronbach α coefficient was .93 for SAD_{UNCOR} and .94 for SAD_{CORR}. Elimination of Item 19 would have increased the internal consistency of SAD_{UNCOR} to .94 but would not have changed the alpha coefficient for SAD_{CORR}.

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The incorrectly scored Item 19 showed a correlation of $-.32$ ($P < .01$) with the total score of SAD_{UNCOR} , whereas the correctly scored Item 19 showed a correlation of 0.43 ($P < .0001$) with the total score of SAD_{CORR} . The correlations between the SAD_{UNCOR} and SAD_{CORR} with other social anxiety measures were comparable and not significantly different, $FNE = .447$ vs. $.453$; $SPAI$ social phobia subscale [Turner et al., 1989] = $.704$ vs. $.713$, respectively. A median-split of the subject sample (a frequently used method to distinguish high and low anxious individuals in analogue studies) classified 98.99% (197 of 199) into the same two groups using SAD_{UNCOR} instead of SAD_{CORR} . Only two participants fell below the median in the SAD_{UNCOR} but were above the median in SAD_{CORR} .

As part of Study 2, we examined the effects of the scoring error on a clinical sample. For this purpose, we studied a group of individuals with a principal DSM-IV diagnosis of social phobia who presented at the Adult Anxiety Clinic of Temple University. All participants received the Anxiety Disorders Interview Schedule for DSM-IV: Lifetime Version [ADIS-IV-L; DiNardo et al., 1994] administered by highly trained master's level clinicians. All participants further received the Liebowitz Social Anxiety Scale (LSAS) [Liebowitz, 1987], a clinician-administered rating scale. Most participants were White (84.9%), female, (52.8%), and single (49.1%) or married (39.1%), employed on a full-time basis (63.2%), and between the ages of 20 and 59 (mean = 35.70; $sd = 9.10$). Most individuals (60.4%) met criteria for the generalized subtype of social phobia. Almost half (44.4%) of individuals had at least one additional Axis I diagnosis.

The result of a paired t test (two-tailed) indicated that the mean score of SAD_{UNCOR} was higher (mean = 19.98; $sd = 7.22$) than the mean score of SAD_{CORR} (mean = 19.75; $sd = 7.58$), $t(105) = 2.38$, $P < .02$. SAD_{UNCOR} showed a slightly lower median (22 vs. 22.5) and mode (26 vs. 27) than SAD_{CORR} . The Wilcoxon signed ranks test was statistically significant, $z(106) = -2.33$, $P < .02$ (two-tailed). The difference between SAD_{UNCOR} and SAD_{CORR} in the means for this group was 1.2% ($[19.98 - 19.75]/19.75$). The standardized Cronbach α coefficient was .89 for SAD_{UNCOR} and .90 for SAD_{CORR} . Elimination of Item 19 would have increased the internal consistency of SAD_{UNCOR} to .90 but would not have changed the α coefficient for SAD_{CORR} . The correlations between the SAD_{CORR} and other social anxiety measures were not significantly higher than the correlations with the SAD_{UNCOR} , $FNE = .447$ vs. $.455$, $SIAS$ [Mattick and Clarke, 1998] = $.748$ vs. $.761$; SPS [Mattick and Clarke, 1998] = $.552$ vs. $.555$; $LSAS$, total score [Liebowitz, 1987] = $.674$ vs. $.687$; FQ , social phobia sub-

scale [Marks and Mathews, 1979] = $.522$ vs. $.538$, respectively.

In summary, the error in the scoring instructions of the SAD resulted in a higher mean, median, and mode than the correctly scored instrument. A bigger percent difference in means between SAD_{UNCOR} and SAD_{CORR} was found in the nonclinical sample. Elimination of Item 19 did not reduce the internal consistency of the corrected test and did not improve the internal consistency of the incorrect version considerably. The correlations to other social anxiety scales were also little affected. We found no difference between a clinical and a nonclinical sample. We conclude that previous studies, which used the incorrect scoring procedure, were unlikely to be significantly biased in their reliability and validity estimates of this scale, but probably overestimated the mean level of social anxiety in the sample. However, it is important to examine the effects of the scoring error on the results of group comparisons in studies that report nonsignificant trends or significance levels in the range of $P < .05$, in which case investigators are advised to recalculate their data with the corrected scoring procedure. In general, we recommend that investigators avoid the scoring error in future studies.

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