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Psychometric Properties of the Mobility Inventory for Agoraphobia: Convergent, Discriminant, and Criterion-Related Validity

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Abstract

Aims of this study were (a) to summarize the psychometric literature on the Mobility Inventory for Agoraphobia (MIA), (b) to examine the convergent and discriminant validity of the MIA's Avoidance Alone and Avoidance Accompanied rating scales relative to clinical severity ratings of anxiety disorders from the Anxiety Disorders Interview Schedule (ADIS), and (c) to establish a cutoff score indicative of interviewers' diagnosis of agoraphobia for the Avoidance Alone scale. A meta-analytic synthesis of 10 published studies yielded positive evidence for internal consistency and convergent and discriminant validity of the scales. Participants in the present study were 129 people with a diagnosis of panic disorder. Internal consistency was excellent for this sample, $\alpha = .95$ for AAC and .96 for AAL. When the MIA scales were correlated with interviewer ratings, evidence for convergent and discriminant validity for AAL was strong (convergent r with agoraphobia severity ratings = .63 vs. discriminant rs of .10-.29 for other anxiety disorders) and more modest but still positive for AAC (.54 vs. .01-.37). Receiver operating curve analysis indicated that the optimal operating point for AAL as an indicator of ADIS agoraphobia diagnosis was 1.61, which yielded sensitivity of .87 and specificity of .73.

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Keywords

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A self-report measure of agoraphobic avoidance, the Mobility Inventory for Agoraphobia (MIA) was published 25 years ago (Chambless, Caputo, Jasin, Gracely, & Williams, 1985). Since that time, the MIA has been widely used for clinical purposes and for research. According to a PsychInfo search, as of August 6, 2010, the original validation article had been cited 231 times. The measure has been reprinted in a number of compendiums of anxiety disorders measures (e.g., Antony, Orsillo, & Roemer, 2001) and translated into 11 other languages (Dutch, Canadian French, German, Hebrew, Japanese, Portuguese, Spanish, Swedish, Italian, Russian, and Greek). The MIA includes two agoraphobic avoidance scales. For the Avoidance Accompanied scale, respondents rate 26 items on Likert-type scales ranging from 1 (*never avoid*) to 5 (*always avoid*) to indicate how much they avoid various situations due to anxiety or discomfort when they are accompanied by a trusted companion. For the Avoidance Alone scale, respondents rate the same items for the circumstances under which they are alone, plus an additional item for staying home alone.[1] The MIA can be administered in paper or Internet versions with consistent results (Austin, Carlbring, Richards, & Andersson, 2006; Carlbring et al., 2007). A copy of the inventory may be found in the Appendix to this article.

Despite the long-standing and widespread use of the MIA, no summary of psychometric research on its reliability and validity has been published, with the exception of a manual on research on the German version of the scale (Ehlers & Margraf, 1993). Although some publications have had as their avowed purpose examination of the psychometric properties of the MIA, in others such information is buried in reports with another primary aim. Accordingly, a review of the MIA's psychometric features is overdue, and the first purpose of the present paper is to provide such a distillation. The second purpose is to add to the psychometric database in areas where little information on the MIA's performance is available, in particular, the MIA's convergent, discriminant, and criterion-related validity with reference to diagnosticians' severity ratings for anxiety disordera and to their diagnosis of agoraphobia.

In a PsychInfo search we located 16 papers in addition to the original validation study (Chambless et al., 1985) in which at least one psychometric property of the MIA was examined. We selected papers published in English, Spanish, or French (the only languages the authors can read), but papers could include data collected with translated versions of the MIA.[2] In Table 1, we summarize the results of 10 papers in which data concerning the internal consistency and/or convergent and discriminant validity of the MIA are reported. Using meta-analytic methods for summarizing correlational data (Rosenthal, 1991), we calculated mean reliability and validity coefficients weighted by sample size. Participants in these studies included student and community subjects and patients with panic disorder with agoraphobia or other anxiety disorders. Studies in Table 1 were conducted in the United

[1]As originally published in 1985 (Chambless et al.), the Mobility Inventory had one less item. Avoidance of *shopping malls* was later added to the scales. Of the studies cited in Table 1, the authors of two used the 26/27-item version (Austin et al., 2006; Carlbring et al., 2007), as does the present study. The remaining authors used the original 25/26-item version.

[2]Thus, we omit the extensive validation work of Ehlers and Margraf (1993) published in German, as well as published validation of a Portuguese version (Gouveia, Duarte, & Seminotti, 1999). In addition we have omitted consideration of Kotov, Schmidt, Zvolensky, and Vinogradov's (2005) English-language description of their Russian translation because the authors added a number of items to the MIA to make it more appropriate for a Russian sample. The data reported for Kotov et al. in Table 1 are from a U.S. community sample that presumably completed the standard English-language version of the MIA.

States (n = 2), Australia (n = 3), Sweden (n = 3), Canada (Anglophone n = 2; Francophone n = 1), and the Netherlands (n = 1).[3]

As can be seen in Table 1, internal consistency data were available for an aggregated sample of 1,279 respondents. As indicated by Cronbach's α of ≥ .93, the MIA scales are highly internally consistent. Test-retest reliability has been reported for several samples. For two samples of agoraphobic patients Chambless et al. (1985) reported test-retest reliability coefficients of .86 for Avoidance Accompanied and .90 for Avoidance Alone over a period of 8 days, whereas the coefficients were .75 and .89, respectively, over a period of 31 days. Over a 42-day interval, Stephenson, Marchand, and Lavallée (1997) reported reliability coefficients of. 75-.76 for a student sample. Finally, Rodriguez, Pagano, and Keller (2007) reported that these scales were remarkably stable over a 5-year period with reliability coefficients of .76 for Avoidance Accompanied and .83 for Avoidance Alone for a sample of patients with panic disorder with agoraphobia. Thus, the available data indicate that test-retest reliability is excellent over short periods and very good even over very long periods.

Investigations of the construct validity of the MIA have involved studies of its factor structure, its convergent and discriminant validity, and its criterion-related validity. Four groups of authors have examined the internal structure of the MIA via factor analysis in American, Australian, Canadian, and Dutch samples of agoraphobic outpatients (Arrindell, Cox, Van der Ende, & Kwee, 1995; Cox, Swinson, Kuch, & Reichman, 1993; Kwon, Evans, & Oei, 1990; Rodriguez et al., 2007). Sample sizes ranged from 124 to 216. Although the results are not entirely consistent, the most common finding (Arrindell et al.; Cox et al., Rodriguez et al.) is a three-factor solution representing avoidance of public places, open spaces, and enclosed spaces.

As reported in Table 1, the convergent validity of the MIA with other self-report measures of agoraphobia has been examined in five studies for Avoidance Accompanied and six studies for Avoidance Alone, most commonly via correlations with the Fear Questionnaire Agoraphobia Scale (Marks & Mathews, 1979). In aggregated samples of over 600 participants, the weighted average convergent validity coefficients were large for both scales,[4] although considerably larger for Avoidance Alone than Avoidance Accompanied (.80 vs. .55, respectively). This is to be expected, as the majority of items on the Fear Questionnaire Agoraphobia Scale, the measure with which Avoidance Accompanied was correlated, concern avoidance of situations when alone. Few data are available on convergent validity with measures of avoidance other than self-report. Chambless et al. (2002) correlated Avoidance Alone with agoraphobia severity ratings of interviewers following the Structured Clinical Interview for DMS-III-R (Spitzer, Williams, Gibbon, & First, 1989). In a sample of 22 patients with a diagnosis of panic disorder with agoraphobia, the correlation was large and statistically significant, r = .54. In contrast, testing the correlations of single Avoidance Alone items with the corresponding tasks on a behavioral approach test, Kinney and Williams (1988) found inconsistent results. The correlations ranged from small and nonsignificant (-.18) to very large and statistically significant (-.84). The median correlation of −.38, although medium in size, was not statistically significant with a sample size of only 37. The modest average agreement between self-report questionnaire items and behavioral tests may reflect the well-known limited correlation between methods of measurement (e.g., Achenbach, Krukowski, Dumenci, & Ivanova, 2005) or the limitations of correlating a measure of how much a respondent might avoid something on average (e.g., driving) versus a very specific test in a high-demand situation (e.g., driving on this particular road, on this particular day, at this particular time, when

[3]Numbers sum to 11 rather than 10 because Austin et al. (2006) included both Swedish and Australian samples in their research.
[4]We follow Cohen's (1988) suggestions of interpreting a correlation of .1 as small, .3 as medium, and .5 as large.

being observed by a research assistant; see Mischel, 2004). Additional data on the MIA's convergent validity with measures other than self-report would be desirable.

Construct validity requires more than the assessment of convergent validity. A valid measure needs not only to be correlated with those measures to which it should show a relationship (e.g., other measures of the same construct), it needs to not be correlated, or to be less correlated, with measures designed to represent different constructs (Campbell & Fiske, 1959). As expected, the MIA scales show low and nonsignificant discriminant correlations with measures of distinct constructs such as scales tapping psychoticism and lying (Arrindell et al., 1995; Chambless et al., 1985). However, this sets a fairly low bar for discriminant validity. More challenging, and more important for the clinical use of the scales, is discriminant validity versus measures of other phobias. In Table 1 we also summarize the results of studies in which authors reported the correlations of the MIA scales with Fear Questionnaire Blood/Injury and Social Phobia scales (Marks & Mathews, 1979). The weighted average discriminant validity coefficients (total $N = 468$) approach medium in size but are notably smaller than the large convergent validity coefficients for both Avoidance Accompanied (.29 vs. .55, respectively) and Avoidance Alone (.28 vs. .80, respectively). This pattern of correlations provides support for the construct validity of the MIA as a measure of agoraphobia. However, in light of the small number of studies on discriminant validity of the MIA, additional data on this topic should be gathered.

In a handful of studies researchers have examined another important indicator of construct validity—criterion-related validity or known-groups validity (Berle et al., 2008; Chambless et al., 1985; Craske, Rachman, & Tallman, 1986; Stephenson et al., 1997). In this research, scores for both Avoidance Accompanied and Avoidance Alone have been shown to be higher in samples with agoraphobia versus (a) community or student samples (Chambless et al., Study 1; Craske et al.; Stephenson et al.), (b) patients with social phobia (Chambless et al., Study 2; Craske et al.), and (c) patients with panic disorder without agoraphobia (Berle et al.). Consistent with the discriminant validity findings summarized in the previous paragraph, these data bolster the argument that the MIA is a measure of agoraphobia rather than of phobia or anxiety disorders more generally. These findings suggest that the MIA may have utility as a screening instrument for research on agoraphobia. However, from these data, it is not possible to tell how effectively the MIA might be used in such a role, as the authors failed to report measures of diagnostic accuracy such as sensitivity (true positive rate) and specificity (true negative rate).

Hoyer, Becker, Neumer, Soeder, and Margraf (2002) addressed this gap in an epidemiologic study of young women in Dresden, Germany. Participants were given a structured diagnostic interview and a modified version of the German translation of the MIA (Ehlers & Margraf, 1993) in which avoidance when alone and when accompanied were not distinguished. Relatively few participants were diagnosed with agoraphobia (36 of 1,873 participants who completed the MIA). The MIA performed well in distinguishing those with agoraphobia in the total sample, with a cutoff score of 1.50 yielding the best combination of sensitivity (.78) and specificity (.85). When the sample was restricted to those who received at least one diagnosis (36 with agoraphobia, 215 with another diagnosis) the same cutoff score (1.50) emerged as the best, with sensitivity of .78 and specificity of .76. Given the fairly small number of people with agoraphobia and the restricted nature of the sample (women between the ages of 18 and 24) additional research on the MIA's diagnostic accuracy is highly desirable.

The purposes of the remainder of this paper are (a) to provide additional data on the internal consistency and the convergent and discriminant validity of the MIA scales via correlations with diagnosticians' clinical severity ratings of agoraphobia and other anxiety disorders,

respectively; and (b) to further examine the MIA's potential utility as a screening tool for agoraphobia via receiver operating curve analysis. This analysis yields not only a test of significance but also reports the sensitivity and specificity of cutoff scores with reference to diagnoses of agoraphobia assigned on the basis of a reliable structured diagnostic interview, the Anxiety Disorders Interview Schedule for DSM-IV (Brown, DiNardo, & Barlow, 1994).

Method

Participants

Participants were 129 individuals with panic disorder who were assessed for inclusion in an ongoing randomized controlled trial of three psychotherapies for panic disorder at one of two study sites (Center for Psychotherapy Research at the University of Pennsylvania School of Medicine or Weill Medical College of Cornell University). They attended diagnostic interviews during 2006-2010. Participants were recruited by advertising, word of mouth, and referrals from other professionals. The mean age was 38.5 (SD = 13.13); 42 (32.6%) were male; 101 (78%) were Caucasian, 17 (13%) were African American, 2 (2%) were Asian, 6 (5%) classified themselves as mixed race or other, and 2 did not report their race. Of the sample, 13 (10%) reported Hispanic ethnicity.

Diagnosticians rated the severity of present disorders according to the Anxiety Disorders Interview Schedule (ADIS) clinical severity rating scales, with the highest severity rating designating the primary diagnosis. Of the participants, 84 had a single primary diagnosis, including 83 with a diagnosis of panic disorder with or without agoraphobia and 1 with major depressive disorder. The other 45 participants had two or more disorders that were rated as equally severe. Of those, 43 had panic disorder with or without agoraphobia as their most severe disorder in conjunction with another equally severe disorder, including generalized anxiety disorder, social phobia, major depressive disorder, dysthymic disorder, obsessive-compulsive disorder, or hypochondriasis. For the remaining two participants with two disorders of equal severity, the most severe disorders included some combination of generalized anxiety disorder, major depressive disorder, and social phobia. Thus, for all but three participants panic disorder was the primary or coprimary diagnosis assigned. Axis I disorders for the sample are listed in Table 2.

Diagnosticians

Diagnosticians were 13 graduate students in clinical psychology and one licensed clinical psychologist (who also served as a diagnostic supervisor). All interviewers received ADIS-IV training to reliability in accordance with Brown, DiNardo, Lehman, and Campbell's (2001) procedures to ensure standardization of administration and diagnostic reliability. All cases were presented and discussed in weekly consensus meetings, and any diagnostic uncertainties were resolved through consensus between the diagnosticians and the primary investigators.

Measures

Anxiety Disorders Interview Schedule-Adult Version—The Anxiety Disorders Interview Schedule-Adult Version (ADIS-IV; Brown et al., 1994) was used to assess current Axis I disorders in all participants. It is a semistructured clinical interview designed to evaluate DSM-IV criteria for many Axis I disorders. Individual diagnoses are rated on a 0-8 clinical severity scale with 4 being the threshold for clinical significance (diagnosis). The ADIS is widely used in anxiety research and has been found to demonstrate interrater reliabilities ranging from acceptable to excellent, with κ's of 0.72 and 0.77 for principal diagnoses of panic disorder with and without agoraphobia, respectively. Reliability of severity ratings for panic disorder with and without agoraphobia was 0.83 (Brown et al.,

2001). For this study a reliability sample of approximately 10% of the sample was drawn.[5] A second diagnostician provided cross-site independent ratings of 13 cases based upon a review of session recordings. Cohen's κ for presence/absence of disorder was 1.00 for panic disorder and also for agoraphobia. Using two-way random effects models, we calculated intraclass correlations for a single rater for the clinical severity ratings figuring in this investigation: ρ_I = .89 for agoraphobia, .76 for generalized anxiety disorder and for social phobia, and .54 for specific phobia. Thus, interrater reliability was very good to excellent except for the less than desirable reliability of ratings of specific phobia.

Mobility Inventory for Agoraphobia—The Mobility Inventory for Agoraphobia (MIA; Chambless et al., 1985) includes the major scales of Avoidance Alone and Avoidance Accompanied, which have been described in the introduction. The MIA also includes a definition of a panic attack and an item on which respondents report frequency of panic attacks in the last week. In addition, respondents are asked to indicate whether they have a safety zone in which they can travel more freely and, if so, to describe it. Only the avoidance scales figured in the present investigation. The current version of the MIA may be found in the Appendix to this article.

Procedure

Following an initial phone screening, participants who were deemed likely eligible for the study were invited to complete an initial intake session consisting of the ADIS. If participants continued to be eligible for participation (i.e., diagnosis of panic disorder; no history of bipolar disorder, psychosis, or past 6 months substance dependence), they were invited back for a second interview at which additional study measures were collected, including the MIA. Participants provided written informed consent, and the research was conducted with approval of the Institutional Review Boards at the universities where participants were recruited.

Results

Internal Consistency

Cronbach's α was calculated for the sample of participants providing complete MIA data; that is, those who skipped no items. Because respondents are encouraged to skip items that are outside of their experience (e.g., boats if they live far inland and have had no experience with boating or opportunity to avoid it), 30 participants left at least one item blank for Avoidance Accompanied and 46 for Avoidance Alone. For the remaining participants internal consistency proved to be excellent: for Avoidance Alone α = .96, N = 83; for Avoidance Accompanied α =. 95, N = 99. All item-remainder correlations were large, .58-. 81 for Avoidance Alone and .45-.76 for Avoidance Accompanied. Of particular interest were the item-remainder correlations for the item *shopping malls*, which, as noted in Footnote 1, was added after the original validation study (Chambless et al., 1985). For both Avoidance Alone and Avoidance Accompanied these correlations were quite large, .79 and . 73, respectively, indicating the new item is highly consistent with the remainder of the measure.

Convergent and Discriminant Validity

Convergent validity was assessed with correlations between the MIA scales and interviewers' ratings of agoraphobia severity from the ADIS. Discriminant validity

[5]The reliability sample was drawn largely, but not entirely, randomly. At one site the first five cases in the sample were included for an immediate reliability check; thereafter, selection was random. Eleven of the 14 diagnosticians were represented in the reliability sample.

coefficients were calculated by correlating the MIA scales with the interviewers' clinical severity ratings for those other anxiety disorders most commonly represented in the sample (generalized anxiety disorder, social phobia, and specific phobia) thus providing the best distributions of severity ratings. These analyses were based on the full sample of 129. Agoraphobia ratings ranged from 0 to 8 in severity (M = 4.21, SD =1.98); generalized anxiety disorder severity ranged from 0 to 7 (M = 2.74, SD = 2.34); social phobia ratings from 0 to 6 (M = 1.33, SD = 2.12); and specific phobia ratings from 0 to 6 (M = 1.22, SD = 1.81). Because the clinical severity rating scales tended to be skewed, both Pearson correlations and Spearman nonparametric correlations were computed. Given that the data were consistent across the methods of analysis, only the Pearson correlations are reported in Table 3. (See coefficients below the diagonal.)

Construct validity is supported when convergent validity coefficients for a measure are significantly larger than its discrminant validity coefficients. In all cases the convergent validity coefficients were substantially larger than the discriminant validity coefficients for the scale in question. To test whether these differences were statistically significant, tests for differences between correlated correlations as described by Meng, Rosenthal, and Rubin (1992) were conducted. For Avoidance Alone the convergent coefficient was significantly larger than each of the three discriminant validity coefficients, all $p < .01$. For Avoidance Accompanied, the convergent validity coefficient was significantly larger than the discriminant validity correlations for generalized anxiety disorder and specific phobia ratings ($p < .01$) but the difference for the comparison with the discriminant validity correlation of Avoidance Accompanied with social phobia ratings failed to reach statistical significance ($p = .08$).

Reliability for clinical severity ratings for agoraphobia was superior to reliability for the severity of the other anxiety disorders (see Measures section). Accordingly, the larger correlation coefficients for the MIA scales with agoraphobia severity might result from greater attenuation of correlations of MIA scales with severity ratings for the other anxiety disorders. We therefore disattenuated the coefficients in Table 3, depicting each correlation as it would be if both scales involved in that correlation were perfectly reliable (Nunnally & Bernstein, 1994). The disattenuated coefficients are reported above the diagonal. We repeated the comparisons of the convergent and discriminant validity coefficients, and the findings were the same. The convergent validity coefficients were statistically larger than the discriminant validity coefficients ($p < .01$) in all cases except for the comparison of the correlation between Avoidance Accompanied and severity of social phobia versus the correlation between Avoidance Accompanied and severity of agoraphobia ($p < .09$).

Criterion-Related Validity

Given that (a) evidence of construct validity for the MIA was stronger for Avoidance Alone than for Avoidance Accompanied in the analyses of convergent and discriminant validity, (b) fear of being alone is a core feature of agoraphobia, and (c) investigators often administer only the Avoidance Alone scale to reduce participant burden, the remaining analyses focus solely on the Avoidance Alone scale. The sample was randomly split in halves for receiver operating curve (ROC) analyses of Avoidance Alone as a predictor of interviewers' diagnosis of agoraphobia. Because the findings were almost identical for the half samples, we report here only the results for the full sample of 129 of whom 99 met criteria for a diagnosis of panic disorder with agoraphobia and 30 panic disorder without agoraphobia.

ROC analysis yielded an area under the curve of .88, SE = .03, $p < .001$, indicating MIA Avoidance Alone performs significantly better than chance (an area under the curve of .50) in predicting a diagnosis of agoraphobia. Any number of cutoff scores could be used,

depending upon the user's needs. Sensitivity is the true positive rate: in other words, it answers the question "How likely is a given Avoidance Alone score to classify people with that score or higher as agoraphobic when they actually carry that diagnosis?" Specificity is the true negative rate; that is, how likely a given Avoidance Alone score is to classify people with that score or lower as *not* having agoraphobia when they in fact do *not* carry the diagnosis. Whether a user decides to emphasize sensitivity or specificity will depend on his or her purpose in using the measure. Accordingly, we provide a range of Avoidance Alone scores and their sensitivity and specificity values in Table 4. Additional data are available from the first author.

Lacking specific reasons to emphasize sensitivity over specificity (or vice versa) the user might choose the optimal operating point as a cutoff score. The optimal operating point may be defined as the value of the test measure yielding the highest sum of sensitivity and specificity (Gallop, Crits-Christoph, Muenz, & Tu, 2003). The last column of Table 4 provides these sums for each value of Avoidance Alone listed. Set in bold font is the score of 1.61, the optimal operating point for this sample, with sensitivity of .87 and specificity of .73. This score sets somewhat higher value on detection of true positives than reduction of false positives.

Discussion

In this paper we have provided a synthesis of the published literature on the psychometric properties of the MIA and have added to that literature by examining the convergent and discriminant validity of the Avoidance Alone and Avoidance Accompanied scales with diagnosticians' severity ratings for agoraphobia and by providing data on the Avoidance Alone scale's sensitivity and specificity as a predictor of a diagnosis of agoraphobia.

On the whole, the MIA demonstrated excellent psychometric properties in the present research as well as in the prior literature. Internal consistency as evinced by Cronbach's α has been consistently high across investigations, as have convergent validity correlations with other self-report and interviewer measures of agoraphobia. Evidence of discriminant validity vis-à-vis measures of other anxiety disorders is also positive in all investigations with one exception. In the present study, the discriminant validity correlation of Avoidance Accompanied with interviewers' ratings of severity of social phobia was substantially smaller than the convergent validity coefficient with severity of agoraphobia (.37 vs. .54, respectively) but this difference failed to be statistically significant ($p = .08$). In contrast, Avoidance Accompanied convergent validity coefficients were larger than discriminant validity coefficients where severity of generalized anxiety disorder and specific phobia were concerned. For Avoidance Alone, evidence for construct validity was uniformly solid: The convergent validity coefficient with severity of agoraphobia ratings was significantly greater than the discriminant validity coefficients for Avoidance Alone with severity of generalized anxiety disorder, social phobia, and specific phobia. These data support the MIA as a specific measure of severity of agoraphobia rather than of phobic and anxiety disorders in general, and this is especially true for Avoidance Alone.

Where criterion-related validity was concerned, in past investigations the MIA has discriminated between respondents with agoraphobia and those with social phobia (Chambless et al., 1985; Craske et al., 1986) and panic disorder without agoraphobia (Berle et al., 2008). In the present study, we replicated Berle et al.'s findings by demonstrating that the MIA Avoidance Alone scale successfully discriminated between panic disorder patients with and without a diagnosis of agoraphobia. Additionally, we conducted analyses of sensitivity and specificity, finding a score of 1.61 was the optimal operating point; that is, yielded the highest sum of sensitivity (.87) and specificity (.73). These data suggest that

when employing this score as a cutoff point for screening patients with panic disorder for a likely diagnosis of agoraphobia, the user will have relatively few false negatives (13%) but will incur a higher risk of false positives (27%). At 1.61, our optimal operating point was higher than the comparable point Hoyer et al. (2002) identified (1.5). Since Hoyer et al. used a modified version of the German MIA eliminating the distinction between Avoidance Alone and Avoidance Accompanied, it is possible that the discrepancy is due to the different versions of the instrument. In addition, Hoyer et al. sought a cutoff point for discriminating community participants with a diagnosis of agoraphobia from other community participants in general or from community participants who met criteria for some disorder other than agoraphobia—a different discrimination from that in the present study. Nonetheless, it is also possible that the present findings of the optimal operating point are simply not stable. Although the findings replicated across two subsamples of the present sample, additional replications are required. For the present, researchers using the MIA as a screening tool would do well to consider whether their samples more closely resemble those in the current study or those in Hoyer et al.'s study.

A limitation of the present research is that all data on reliability and validity come from a sample of treatment-seeking participants with a diagnosis of panic disorder. Thus, these findings may not extend to mixed samples of patients or people from the community. This concern, however, is mitigated by other studies on the MIA's psychometric properties yielding positive results with a variety of populations including students, community samples, and patients with a range of anxiety disorders.

In summary, 25 years after its publication, psychometric data on the MIA warrant its continued use in research on panic disorder and agoraphobia. In addition, data on its sensitivity and specificity are sufficiently encouraging to suggest its use as a screening measure to detect likely agoraphobia in a sample of patients with panic disorder.

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APPENDIX

MOBILITY INVENTORY

1. Please indicate the degree to which you avoid the following places or situations because of discomfort or anxiety. Rate your amount of avoidance when you are with a trusted companion and when you are alone. Do this by using the following scale:

1	2	3	4	5
never avoid	rarely avoid	avoid about half of the time	avoid most of the time	always avoid

Circle the number for each situation or place under both conditions: when accompanied and when alone. Leave blank situations that do not apply to you.

Places	When Accompanied	When Alone
Theaters	1 2 3 4 5	1 2 3 4 5
Supermarkets	1 2 3 4 5	1 2 3 4 5
Shopping malls	1 2 3 4 5	1 2 3 4 5
Classrooms	1 2 3 4 5	1 2 3 4 5
Department stores	1 2 3 4 5	1 2 3 4 5
Restaurants	1 2 3 4 5	1 2 3 4 5
Museums	1 2 3 4 5	1 2 3 4 5
Elevators	1 2 3 4 5	1 2 3 4 5
Auditoriums/stadiums	1 2 3 4 5	1 2 3 4 5
Garages	1 2 3 4 5	1 2 3 4 5
High places	1 2 3 4 5	1 2 3 4 5
Enclosed spaces	1 2 3 4 5	1 2 3 4 5

Open Spaces	When Accompanied	When Alone
Outside (e.g., fields, wide streets, courtyards)	1 2 3 4 5	1 2 3 4 5
Inside (e.g., large rooms, lobbies)	1 2 3 4 5	1 2 3 4 5

Riding In	When Accompanied	When Alone
Buses	1 2 3 4 5	1 2 3 4 5
Trains	1 2 3 4 5	1 2 3 4 5
Subways	1 2 3 4 5	1 2 3 4 5
Airplanes	1 2 3 4 5	1 2 3 4 5
Boats	1 2 3 4 5	1 2 3 4 5

Driving or Riding in a Car	When Accompanied	When Alone
At anytime	1 2 3 4 5	1 2 3 4 5
On expressways	1 2 3 4 5	1 2 3 4 5

ituations	When Accompanied	When Alone
Standing in lines	1 2 3 4 5	1 2 3 4 5
Crossing bridges	1 2 3 4 5	1 2 3 4 5
Parties or social gatherings	1 2 3 4 5	1 2 3 4 5
Walking on the street	1 2 3 4 5	1 2 3 4 5
Staying home alone		1 2 3 4 5
Being far away from home	1 2 3 4 5	1 2 3 4 5
Other (specify):	1 2 3 4 5	1 2 3 4 5

2. After completing the first step, circle the five items with which you are most concerned. Of the items listed, these are the five situations or places where avoidance/anxiety most affects your life in a negative way.

Panic Attacks

3. We define a panic attack as:
   1. A high level of anxiety accompanied by . . .
   2. strong body reactions (heart palpitations, sweating, muscle tremors, dizziness, nausea) with . . .
   3. the temporary loss of the ability to plan, think, or reason and . . .
   4. the intense desire to escape or flee the situation (Note: this is different from high anxiety or fear alone).

Please indicate the number of panic attacks you have had in the past 7 days: _____

How severe or intense have the panic attacks been? (Circle a number on the line below):

1	2	3	4	5
very mild	mild	moderately severe	very severe	extremely severe

4. Many people are able to travel alone freely in the area (usually around their home) called their safety zone. Do you have such a zone? If yes, please describe:

a. its location

b. its size (e.g., radius from home)

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Research Highlights

- Meta-analysis of 10 studies indicates the Mobility Inventory for Agoraphobia has excellent internal consistency and convergent and discriminant validity.
- New data for the Mobility Inventory show convergent validity with diagnosticians' ratings of agoraphobia severity and discriminant validity with diagnosticians' ratings of severity of other anxiety disorders.
- As an indicator of diagnosis of agoraphobia, a cutoff score of 1.61 on Avoidance Alone yields sensitivity of .87 and specificity of .73.

Table 1

Psychometric Properties of the Mobility Inventory for Agoraphobia Avoidance Scales: Internal Consistency (CCronbach's a) and Convergent and Discriminant Validity Coefficients (*r*)

	Avoidance Accompanied (AAC)			Avoidance Alone (AAL)		
Study	**α**	**Convergent Validity *r***	**Discriminant Validity *r***	**α**	**Convergent Validity *r***	**Discriminant Validity**
Arrindell et al. (1995)	.95	.63	.42[a]	.95	.84	.30[b]
Austin et al. (2006)	.94[c]			.95[d]		
	.96[e]			.97[f]		
Carlbring et al. (2007)	.94[g]			.94[h]		
Chambless et al. (1985)	.97	.44		.96	.68	
	.91			.94		
Craske et al. (1986)	.94			.87		
Kotov et al. (2005)				.91		
Kwon et al. (1990)		.49	.24[i]		.76	.23[j]
Öst (1990)					.81	
Stephenson et al. (1997)	.85	.48	.14	.87	.82	.28
	.86			.90		
Swinson et al. (1992)	.89	.58		.89	.78	
Weighted Average	.93	.55	.29	.94	.80	.28
Total *N*	1279	631	468	1374	681	468

Note. Median sample sizes were used when authors presented a range of sample sizes.

[a]Average *r* for AAC with Fear Questionnaire-Blood Injury and -Social Phobia

[b]Average *r* for AAL with Fear Questionnaire-Blood Injury and -Social Phobia

[c]Average α for AAC for Internet and paper versions from a Swedish sample

[d]Average α for AAL Internet and paper versions from a Swedish sample

[e]Average α for AAC for Internet and paper versions from an Australian sample

[f]Average α for AAL for Internet and paper versions from an Australian sample

[g] Average AAC α for two subsamples

[h] Average AAL α for two subsamples

[i] Average AAC *r* with Fear Questionnaire-Blood/Injury and -Social Phobia

[j] Average AAL *r* with Fear Questionnaire-Blood/Injury and -Social Phobia

Table 2

Frequency and Percentage of Diagnoses

Disorder	*n*	%
Panic disorder	129	100.00
Agoraphobia	99	76.70
Generalized anxiety disorder	61	47.30
Specific phobia	32	24.80
Social phobia	32	24.80
Major depressive disorder	23	17.80
Posttraumatic stress disorder	10	7.80
Obsessive–compulsive disorder	8	6.20
Dysthymic disorder	7	5.40
Alcohol abuse or dependence	5	3.90
Hypochondriasis	3	2.30
Substance abuse or dependence	2	1.60

Note. n and total percentage do not add to 129 and 100%, respectively, because of comorbid diagnoses.

Table 3

Correlations (and Disattenuated Correlations) of Mobility Inventory Avoidance Scores with ADIS Interviewers' Clinical Severity Ratings for Anxiety Disorders: Convergent and Discriminant Validity (N = 129)

	AAC	AAL	Ag Sev	GAD Sev	Soc Ph Sev	Sp Ph Sev
AAC	-	.83	.59	.20	.44	.10
AAL	0.79**	-	.68	.19	.34	.14
Ag Sev	**0.54****	**0.63****	-	.18	.26	.00
GAD Sev	0.17a	0.16a	0.15	-	.25	−.08
Soc Ph Sev	0.37**	0.29**a	0.21*	0.19*	-	.19
Sp Ph Sev	0.07[a]	0.10[a]	.00	−0.05	0.12	-

Note. Correlations disattenuated for less than perfect reliability are given above the diagonal. ADIS = Anxiety Disorders Interview Schedule, AAC = Mobility Inventory Avoidance Accompanied, AAL = Mobility Inventory Avoidance Alone, Ag Sev = ADIS rating of agoraphobia severity, GAD Sev = ADIS rating of generalized anxiety disorder severity, Soc Ph Sev = ADIS rating of social phobia severity, Sp Ph Sev= ADIS rating of specific phobia severity. Correlations in bold represent convergent validity coefficients.

[a]Indicates the difference between the relevant convergent validity coefficient and this discriminant validity coefficient was statistically significant, $p < .01$.

*$p < 0.05$

**$p < 0.01$.

Table 4

Receiver Operating Curve Analyses for Mobility Inventory Avoidance Alone Scores (MI AAL) with Interviewers' Diagnoses: Sensitivity, Specificity, and the Optimal Operating Point (N = 129)

MI AAL Score	Sensitivity	Specificity	Optimal Operating Point (Sensitivity + Specificity)
1.24	.95	.33	1.28
1.25	.95	.37	1.32
1.26	.95	.43	1.38
1.28	.95	.47	1.42
1.31	.95	.5	1.45
1.35	.94	.5	1.44
1.39	.94	.53	1.47
1.40	.94	.57	1.51
1.43	.92	.63	1.55
1.45	.91	.63	1.54
1.50	.91	.67	1.58
1.54	.90	.7	1.60
1.57	.87	.7	1.57
1.61	**.87**	**.73**	**1.60**
1.65	.85	.73	1.58
1.67	.83	.73	1.56
1.69	.83	.77	1.60
1.70	.82	.77	1.59

Note. The bold MI AAL number indicates the score representing the optimal operating point (OOP; maximum sum of sensitivity plus specificity) prior to rounding: OOP for a MI score of 1.61 = 1.602; OOP for a MI score of 1.69 = 1.595.