BRIEF REPORT:
Initial Validation of an Online DSM-Based Mental Health Screening Inventory

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Running Title: Online Mental Health Inventory

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Abstract

A brief online inventory for screening mental health problems was found to be a valid measuring instrument based on analysis of data obtained from 3,400 subjects. The 54-item checklist screens for 18 of the most common problems identified in the DSM-IV and takes from 5 to 10 minutes to complete. Test scores proved to be good predictors of a variety of self-reported criterion measures, including happiness, personal and professional success, history of hospitalization, history of therapy, current participation in therapy, employment, and level of education. Females were found to have slightly more mental health problems than males, but no differences in scores were found by race or ethnicity.

Keywords: mental health screening test, DSM, online testing, diagnostic tests, online mental health screening

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The present study consists of an initial evaluation of a quick screening inventory–the *Epstein Mental Health Inventory* (EMHI)–for mental health problems, available over the Internet free of charge at http://DoYouNeedTherapy.com. This study looks at data from 3,403 people who took the test between May 20, 2007, and September 29, 2008.

Thousands of psychological tests are available online, but few have been scientifically validated. One website alone—http://OKCupid.com—contains more than 40,000 user-contributed tests, none of which have been scientifically validated. Because millions of people now rely on the Internet for information about mental health, it is important to make empirically-based tests available and, somehow, to identify them to the public as superior measuring instruments.

METHODS

Test Design

The present test is distinct from other Internet-based mental health tests in several respects: (1) It includes demographic and criterion questions that can be used for validation purposes. (2) It includes diagnostic criteria from 18 of the most common disorders listed in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association, 2000) (Table 1). (3) It is fairly comprehensive across mental health problems, whereas most online mental health tests, such as the online Beck Depression Inventory (Beck,

Steer, & Brown, 1996), focus on one narrow area of dysfunction. The EMHI consists of 54 items in a checklist format.

Three common criteria from each of the 18 major categories of dysfunction are included, with all 54 items presented in a random order. Technical jargon is avoided. A typical item is, "Over the past year, my mood has shifted more than once from depressed to highly elevated." The test-taker is directed to check off any of the items which he or she believes to be true.

The 18 categories of dysfunction include: Substance Abuse, Psychosis, Depression, Mania, Bipolar Disorder, Other Mood Disorder, Phobia, Social Phobia, Obsessive-Compulsive Disorder, Posttraumatic Stress Disorder, Generalized Anxiety Disorder, Other Anxiety Disorder, Relational Disorder, Sexual Disorder, Eating Disorder, Impulse Disorder, Personality Disorder, and Somatoform Disorder. Although not included in the DSM-IV, Relational Disorder is included in the present test because it is likely to be included in the DSM-V and will likely be found to have high prevalence (Beach & Kaslow, 2006).

Upon completion of the test, if no items are checked off, the test taker is complimented on his or her good mental health. If one item has been checked off in any one category, the test taker is advised in mild language that he or she might benefit by consulting with a mental health professional. If two items have been checked off in one or more categories, a stronger recommendation is made. If all three items have been checked off in one or more categories, the test taker is urged to see a mental health professional. If items are checked off in multiple categories, separate recommendations are made. The categories are identified, and the test-taker is also advised that only a qualified professional can diagnose.

Demographics

90 percent of the online sample of 3,403 individuals was from the U.S. and Canada and the remainder were from 34 other countries. 61 percent were female and 32 percent male (in addition, 8 individuals identified themselves as "other," and 231 are unknown). The mean age of test takers was 34.2. 2,508 identified themselves as white and 660 as non-white (21 American Indian, 277 Asian, 107 Hispanic, 138 black, and 117 other), with the remainder (235) unknown. Level of education was higher than in the general population (225 none, 1,146 high school, 318 associates degree, 1,152 college, 431 masters, 95 doctorate, 35 unknown).

RESULTS

Validity

Test scores proved to be good predictors of the criterion variables (all self-reported), suggesting that the test is a valid measure of mental health problems: happiness ($\rho = -0.53$, $p<.01$), personal success ($\rho = -0.42$, $p<.01$), professional success ($\rho = -0.39$, $p<.01$), as well as employment ($U = 872{,}683$, $p<.01$), history of psychotherapy ($U = 1{,}153{,}897$, $p<.01$), hospitalization ($U = 359{,}884$, $p<.01$), and current participation in therapy ($U = 464{,}161$, $p<.01$). Mental health problems were also negatively correlated with education level ($\chi^2 = 127$, $p<.01$). Symptoms were distributed roughly normally, again suggesting the validity of the measuring instrument (Figures 1 & 2). Because of the checklist format of the test, in which individual items have zero variance, reliability measures (such as Cronbach's alpha) could not be applied.

Other Results

Gender differences were also found, with females scoring about 17 percent higher than males ($\chi^2 = 28.6$, $p<.01$; $\bar{\times}_{male} = 10.6$; $\bar{\times}_{female} = 12.4$). Differences by race and ethnicity were not found ($\chi^2 = 9.8$, $p=.08$). As one might expect, the prevalence of disorders was generally higher

than is believed to occur in the general population (Table 1); only about 5 percent of test takers reported no symptoms.

DISCUSSION

The use of objective tests for evaluating mental health problems is sometimes called into question; some argue that there is simply no substitute for the face-to-face clinical interview (e.g., Hunsberger, 2007). Others have argued that an informal interview can be improved through the use of a structured format (Williams et al., 1992) or that a structured interview by a non-clinician can be adequate for assessment (Koenig et al., 1989). We believe that the present test sidesteps the debate about the value of objective testing, at least to some extent. Like it or not, the Internet is being widely used now by millions of people to assess their mental health difficulties. As a validated, DSM-based instrument, the EMHI is probably a better assessment tool than many that people are currently employing, and its main purpose is in fact to encourage people to visit a therapist, who can then put his or her clinical insights to work.

Subjects in Internet research are necessarily self-selected; in the present study, Internet sampling has yielded higher frequencies of symptoms than would be expected in the general population (Table 1). This type of sampling also makes it difficult to establish concurrent validity and test-retest reliability. On the bright side, computer screening tools might actually encourage more honest responses than do face-to-face interviews (Barack, 1999; Burke, 1993; Martin & Nagao, 1989). The newest version of the EMHI, not employed in the present study, includes a request for an email address (collected in a way that preserves subject confidentiality), which will allow various follow-up studies (test-retest reliability, and concurrent validity, and long-term follow-up) to be conducted in the future.

The selection of symptoms specified in the EMHI was also made relativity arbitrarily, because prevalence data for DSM criteria generally do not exist; DSM criteria are selected by consensus vote, not by empirical data (Zimmerman et al., 2006). If such prevalence data eventually become available, EMHI criteria can be adjusted accordingly. Meanwhile, the strong predictive validity of this test suggests that it may have immediate value for mental health screening both online and in clinical settings.

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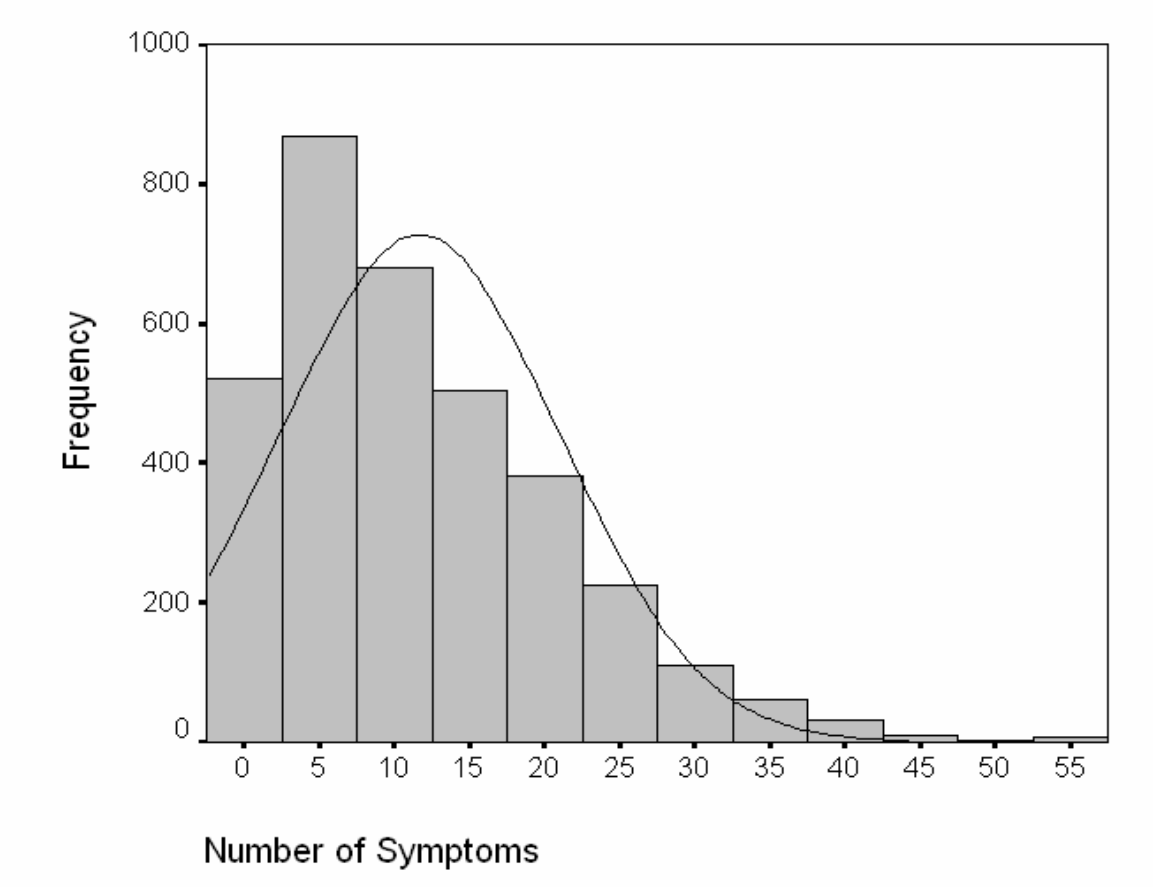
Figure Caption

Figure 1. Frequency distribution of number of symptoms per subject. A normal curve is superimposed.

Table 1. Prevalence of Disorders by General Population and EMHI Subjects

Disorder	General U.S. Population Studies	EMHI (2 symptoms checked off)	EMHI (all 3 symptoms checked off)
Impulse Control	8.9%	14.7%	.8%
Phobia	8.3%	10.2%	9.2%
Social Phobia	6.8%	16.6%	17.1%
Depression	6.7%	18.3%	10.4%
Personality	6.0%	7.3%	1.9%
Substance Abuse	3.8%	6.1%	7.2%
PTSD	3.5%	9.3%	6.0%
Generalized Anxiety	3.1%	19.1%	19.7%
Other Anxiety	3.1% *	9.2%	5.6%
OCD	2.4%	14.9%	9.8%
Other Mood	1.5%	16.4%	8.5%
Mania	1.0%	3.8%	.9%
Bipolar	.85%*	10.7%	13.8%
Psychosis	.75%*	7.0%	2.1%
Eating	.75%*	3.5%	1.1%
Somatoform	.2%	5.3%	0%
Sexual	.002%*	13.2%	1.0%
Relational**	?	11.8%	11.4%

Sources: Aalto-Setala et al., 2001; Kessler et al., 2005; Kopeikin, 1998; National Institute of Mental Health, 2008; U.S. Department of Health and Human Services, 1999.
*Mean of credible estimates.
**Not currently listed in the DSM-IV, but likely to be included in the DSM-V


1000
800
600
400
200
0
Frequency
0
5
10
15
20
25
30
35
40
45
50
55
Number of Symptoms