

Depressed or Just Blue? The Persuasive Effects of a Self-Diagnosis Inventory¹

PRIYA RAGHUBIR²

*Haas School of Business
University of California–Berkeley*

GEETA MENON³

*Leonard N. Stern School of Business
New York University*

A self-diagnosis inventory is both a response instrument and a tool for an individual to assess his or her risk. Three experiments show that the manner in which a depression self-diagnosis inventory is administered and constructed affects the manner in which a respondent interprets behavioral symptoms. This in turn affects (a) self-reports of whether the symptoms apply to the respondent; (b) the respondent's perceived risk of depression; (c) the perceived controllability of the behavioral symptoms; and (d) the respondent's likelihood of seeking treatment. Theoretical implications of the content and format of self-diagnosis inventories are discussed, as are implications for how to persuade people to seek assistance when they are at risk.

A self-diagnosis inventory is a tool for an individual to assess his or her risk of a health hazard. At the same time, it is also a response instrument and, therefore, may play a persuasive role in helping respondents to assess their own risk, which, in turn, would affect intentions to seek assistance. Our main thesis is that the manner in which self-diagnosis inventories are constructed (i.e., their format and content) provides contextual cues that affect the manner in which respondents interpret ambiguous behavioral symptoms and identify whether or not they are at risk and whether or not they should seek treatment.

We examine the role of such inventories in the context of depression, a physiological health problem that is initially self-diagnosed using self-reported psychological inventories. The focus of this paper is to examine the role played

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²Correspondence concerning this article should be addressed to Priya Raghbir, Haas School of Business, University of California, Berkeley, CA 94720-1900. E-mail: raghubir@haas.berkeley.edu

³Order of authorship is reverse alphabetical and reflects equal contribution by each author.

by self-diagnosis inventories in untreated depression. We examine whether the manner of construction of these inventories can increase the likelihood that those at risk identify their depressive symptoms, assess their risk, and seek treatment.

The issue of self-diagnosis brings depression into the domain of survey methodology and questionnaire construction. A rich tradition of research in the cognitive aspects of survey methods has shown that people's behavioral reports frequently are constructed as a function of the context, rather than from information retrieved from memory (for a review, see Schwarz & Sudman, 1994).

Since diagnosis of depression relies on self-administered inventories, it is a domain that lends itself to bridging areas that span survey methods and persuasion. The self-inventory is at once a response instrument and a diagnostic tool for individuals to assess whether or not they are at risk, implying that such inventories might play a persuasive role in helping respondents to overcome their perceptions of invulnerability. Our focus is on getting potential depressives to seek assistance.

We now present the conceptual framework of how self-diagnosis inventories can lead to behavior interpretation and play a persuasive role. This is followed by a description of three experiments and a discussion of the implications of our results for survey methodologists, social marketers, and social psychologists.

Conceptual Framework

The central issue for health problems is to get a person at risk to acknowledge susceptibility and to seek professional diagnosis and, if required, treatment (Raghubir & Menon, 1998). Behavioral self-reports serve a primary diagnostic function for people to decide whether or not they are at risk and need to seek professional assistance for diagnosis and treatment. Specifically, the three steps that are required for a person to accept risk and seek treatment are: (a) to identify his or her behavioral symptoms accurately, (b) to believe that the symptoms are diagnostic of depression, and (c) to believe that the symptoms can be controlled through intervention. The design of self-diagnosis depression inventories can affect all three stages.

The American Psychiatric Association's (APA, 2000) *Diagnostic and Statistical Manual of Mental Disorders IV* (DSM IV) characterizes *depression* as a loss of interest or pleasure in activities that a person enjoyed, a person feeling unusually sad or irritable over a 2-week period, or both. The manual provides nine symptoms of depression, which are listed in Appendix A. The symptoms differ from each other in terms of how ambiguous they are, and self-diagnosis inventories differ from each other in the response scales they use to elicit self-diagnoses. Given this variance, the following research questions will be addressed:

Research Question 1. Does the design of a self-diagnosis inventory affect how people interpret behaviors that are symptomatic of depression? (This would affect whether or not they would be able to identify their behavioral symptoms accurately.)

Research Question 2. Does the content of a self-diagnosis inventory affect beliefs that the behaviors are symptomatic (or diagnostic) of depression?

Research Question 3. Does the design and content of a self-diagnosis inventory affect beliefs that the behaviors are controllable through treatment?

Research Question 4. Do beliefs regarding the diagnosticity and controllability of the behavioral symptoms affect perceptions of risk and intention to seek medical assistance?

Figure 1 illustrates the conceptual model that we propose in this paper.

Behavior Identification

A behavioral symptom can be likened to a signal used to detect an event. Based on the predictions of signal detection theory (SDT) regarding the strength of a signal, we propose that a behavioral symptom can be ambiguous as a result of a number of reasons (Sperling & Doshier, 1986).

Degree of Existence

A symptom is more ambiguous if it can exist to some degree, rather than if it is characterized by its presence or absence. This is similar to the threshold of detectability from SDT.

Actual Expected Consistency

A symptom is more ambiguous if it occurs only some of the time it is expected to occur, rather than all of the time it is expected to occur. The expectation of whether it will occur all the time or only some of the time is a function of whether the behavior is a state of being, which should be present all the time, or a specific event, which should only occur some of the time. This implies that specific behavioral events are less ambiguous than are states of being.

Causal Clarity

A behavior is less ambiguous if every occurrence of the symptom is associated with the disease to which it relates (i.e., the signal has high detection

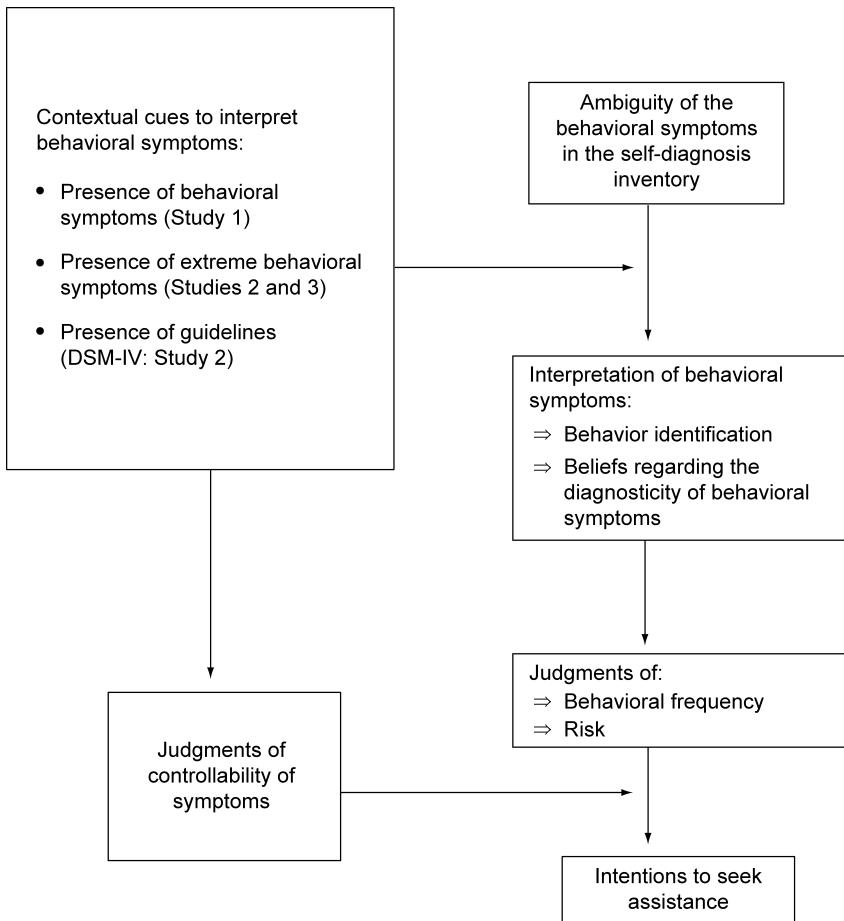


Figure 1. Conceptual model of behavioral interpretation using contextual cues. DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; APA, 2000).

potential, with few false alarms). It is more ambiguous when the symptom could be a result of reasons other than a single disease (i.e., the signal has low detection potential because of the large number of false alarms).

Measurement Error

A behavioral symptom is more ambiguous if it lacks physiological measurement methods. In an SDT parallel, this is because the presence of physiological tests allows an observer to become an ideal observer.

Extremity of Consequence

A behavior may be considered more ambiguous when its consequences are moderately debilitating, as compared to when they are extreme and lead to severe disability or death. In an SDT parallel, the extremity of the consequence impacts the expected gain from the signal-detection task: The gain is higher when the consequence of the symptom is more extreme.

Frequency of Occurrence

A behavior that has a higher frequency of occurrence in a population is more ambiguous than one that has a low frequency of occurrence. This is because the behavior may appear to be more normal and, therefore, less diagnostic of a disease (with a higher likelihood of leading to false alarms).⁴

For example, one of the symptoms of depression is “feeling more tired than usual.” We suggest that such a symptom is ambiguous because it may exist to some degree (i.e., the extent of tiredness felt is a range, rather than a dichotomous presence or absence of tiredness), it may be felt inconsistently (i.e., sometimes one is more tired than at other times), it lacks causal clarity (i.e., there are many different causes for being tired, including but not limited to depression), it is difficult to measure (i.e., there are no blood tests that can establish level of tiredness, as there are to establish the level of cholesterol in the blood, for instance), it has moderate consequences, and many people complain of tiredness.

On the other hand, the ninth symptom of depression (“thoughts of suicide or death”; Appendix A) is less ambiguous, as it is a dichotomous variable (i.e., either you think of killing yourself or you do not), and it is not expected to occur. Therefore, a single occurrence of such a thought is unexpected and diagnostic (for a discussion on the higher diagnosticity of events where actual experience deviates from expected experience, see Menon & Raghbir, 2003). It has causal clarity inasmuch as having thoughts of suicide suggests that one is depressed, given that there are very few other reasons why one might have such thoughts. It is more measurable than a state of being, it has an extreme consequence, and it is demonstrated by a relatively low percentage of people.

We propose that the ambiguity of a symptom may lead to people inaccurately identifying their behavioral symptoms and discounting the diagnosticity of these symptoms. We refer to this as *interpretation of behavioral symptoms* (Figure 1). By interpreting a behavior or state as *normal*, rather than *sympto-matic of a disease*, respondents can self-select out of the at-risk group. The first eight of the nine behaviors listed in Appendix A that are symptomatic of depression are more ambiguous than the ninth and may be subject to interpretation.

⁴We thank an anonymous reviewer for pointing out some of these sources of behavioral ambiguity.

To disambiguate these behaviors, people may search for cues to interpret the behavior to form a judgment as to whether or not the behavioral symptom applies to them (for the information value of response alternatives to survey respondents, see Menon, Raghbir, & Schwarz, 1995). Contextual cues, such as those available in the inventory, are not only easily accessible, but may seem to be particularly pertinent to the judgment of whether or not a person may be at risk. For example, if there is low awareness of the symptoms associated with depression, mere awareness of the behaviors characterizing depression should raise people's estimates of their own risk.

Study 1 examines the issue of behavior identification and interpretation. We argue that as most of the behaviors characterizing depression are *normal*, people may be unaware that they are symptomatic of depression. Exposing people to the items in the self-diagnosis inventory should increase people's belief that they may be at risk. We test the following hypothesis:

Hypothesis 1. The administration of a self-diagnosis inventory will lead to perceptions of higher risk of depression.

Prior literature has shown that people's reports of behavioral frequencies are tensile and subject to contextual cues (Menon, 1997; Menon et al., 1995; Schwarz, 1990). Context, in the form of the order in which questions are asked, has been shown to affect responses (Raghbir & Johar, 1999). In the domain of perceptions of the risk of cancer, Lin, Lin, and Raghbir (2003a) showed that when self-estimates are elicited before other estimates, the self-positivity bias is attenuated, but when others' estimates are elicited prior to self-estimates, this cues comparative (versus absolute) judgments about the self, and the bias re-emerges.

We propose that if people's estimates of risk are elicited prior to whether or not they have the behavioral symptoms of depression, they will wish to interpret the behaviors in a manner consistent with their belief that they are not depressed. To the extent that the behaviors are ambiguous, they will be able to interpret the behaviors. Thus, we test the following operational hypothesis:

Hypothesis 2. Behavioral self-reports for ambiguous symptoms of depression will be lower when elicited subsequent to (versus prior to) judgments of own risk.

Beliefs of Diagnosticity

While behavior identification is a necessary precondition to seeking treatment, it may not be a sufficient condition. Respondents must believe that the behaviors are diagnostic of depression. Unlike the first eight symptoms of depression, the ninth symptom ("thoughts of suicide or death") is unambiguously

extreme. While it is, in fact, no more diagnostic of depression than the other symptoms (and less diagnostic than Symptoms 1 and 2), the fact that it is extreme may lead to it to be perceived to be more diagnostic, as it may overshadow the others on the inventory (Nisbett, Fong, Lehman, & Cheng, 1987). Its presence could lead people to discount the diagnosticity of the other behavioral symptoms, as the extreme behavior provides a normatively inappropriate reference against which comparisons can be made.

The predictions of SDT are not contingent on contextual cues. Rather, they relate to the intrinsic aspects of a behavior: its frequency, causal clarity, extremity, and so forth. However, the context in which a symptom is assessed could affect respondents' beliefs regarding the relative diagnosticity of the symptom (or the strength of the signal). The finding that people infer information from the context and use this to compute various kinds of judgments and probabilities has been demonstrated as a robust phenomenon in various domains (e.g., question wording and sequencing: Schwarz, Hippler, Deutsch, & Strack, 1985; and health risk estimates: Menon, Block, & Ramanathan, 2002).

We propose that the inclusion of an extreme behavioral symptom will decrease the diagnosticity of the less extreme behavioral symptoms, as it will overshadow the others on the inventory (Nisbett et al., 1987). This implies that the strength of a signal will itself be contingent on the context in which it is assessed, or that the perceived diagnosticity of any one given depressive symptom will be assessed contingent on the perceived diagnosticity of alternative depressive symptoms that are accessible to the respondent at the same time. In short, the perceived diagnosticity of any one symptom of depression will be contingent on the types of other symptoms included along with it on the self-diagnosis inventory.

However, according to the DSM-IV's (APA, 2000) guidelines, the extreme behavior is, in fact, less diagnostic than the first two symptoms (i.e., "loss of interest or pleasure in activities normally enjoyed," and "feeling unusually sad or irritable over a 2-week period") and no more diagnostic than the remaining six behaviors. Therefore, if participants are informed of the appropriate DSM-IV classification scheme, then the presence of an extreme behavior should be less likely to dilute the diagnosticity of the other behaviors on the self-report inventory. We hypothesize the following:

Hypothesis 3. Information about the relative diagnosticity of behavioral symptoms will moderate the effect of the inclusion of an extreme behavior on judgments of risk:

Hypothesis 3a. The inclusion of the extreme behavior will decrease the diagnosticity of other behavioral symptoms in the absence of information about guidelines, while

Hypothesis 3b. The presence of information will attenuate this effect.

Study 2 tests whether the presence of the suicide/death symptom leads respondents to believe that the remaining eight symptoms are less diagnostic of depression. The study also tests whether feedback about the DSM-IV (APA, 2000) guidelines mitigates this effect.

Judgments of Controllability

A major issue in health psychology is persuading people who may be at risk to accept their risk level (Menon et al., 2002; Raghubir & Menon, 1998, 2001). Lin, Lin, and Raghubir (2003b) showed that events that are perceived to be more in an individual's control are more strongly associated with the self-positivity bias (i.e., the self is less at risk than others) than events that are perceived to be less controllable (e.g., cancer). However, the authors focused on the control of an individual over contracting a disease. We propose that the perception of whether the disease is controllable via medical intervention is also a critical element in encouraging people to seek treatment. Getting people to accept their level of risk of depression may be a necessary but insufficient condition to get them to seek treatment, especially as depression is believed by many to be a weakness rather than an illness (Appendix A). Interventions that simultaneously can bring self-perceptions of risk in line with behavioral symptoms and increase beliefs in the controllability of those symptoms should have a favorable effect on help seeking.

We propose that the unambiguous symptom "thoughts of suicide/death" is less likely to be explained away as a weakness, and more likely to be identified as a medical symptom. Its unambiguous measurement, low frequency of occurrence, causal clarity, and extremity of consequence together suggest that it is *abnormal*; that is, it is symptomatic of a disease which medical intervention could assist with. The fact that depression includes this symptom should increase people's beliefs that it is controllable via intervention. We propose the following:

Hypothesis 4. The inclusion of the extreme behavior "thoughts of suicide/death" will have the following effects:

Hypothesis 4a. It will increase perceived controllability of other behavioral symptoms.

Hypothesis 4b. It will reduce the estimated risk to oneself.

Study 3 shows that the presence of the suicide/death symptom increases perceptions of controllability of the remaining symptoms. However, its presence also leads to lower perception of own risk and intention to seek help.

Study 1: Persuasive Effect of Completing a Self-Diagnosis Inventory

Study 1 tests Hypotheses 1 and 2, which argue that eight of the nine depression symptoms are poor signals to detect depression. The symptoms can exist to some degree (rather than be dichotomously present or absent), are expected to occur only part of the time (rather than always), have poor causal clarity (as they may be associated with other conditions other than depression), are measured with error, do not have extreme consequences, and may occur frequently. In other words, they are ambiguous, making it possible for respondents to interpret them differently as a function of context.

Operationally, we test that administering an inventory will lead to perceptions of higher risk of depression (see Hypothesis 1, as people will identify depressive symptoms) but that self-reports of symptoms will be lower if they are elicited subsequent to risk estimates (see Hypothesis 2, as respondents will interpret the symptom differently contingent on whether or not they believe they are depressed).

Method

Participants. Study participants were 48 undergraduate students (27 male, 17 female, 4 did not indicate gender) who received partial course credit for completing the study. The mean age of respondents was 21.05 years. Of the participants, 6 reported they were being treated for depression currently. Since most of our measures have to do with behavioral symptoms and risk estimates, all analyses were conducted excluding these 6 participants. The data were collected in New York City in late November and early December 2000.

Procedure. The study began with a general set of instructions about experiments, followed by some general information about depression (Appendix B) prior to completing the questionnaire (explained in more detail in Measures). At the completion of the questionnaire, respondents were asked to provide some background information about whether they were aware of any family history of depression, whether they had ever spoken to their doctors about the possibility of being depressed, whether they had ever received treatment for depression, whether they were currently receiving treatment for depression, and whether they knew anyone who was depressed. Subsequent to these five background questions (which were answered *Yes* or *No*), we asked participants their gender and age.

Debriefing was done collectively after the experiment was completed. We also ensured that we provided information about how and where students could seek help. Depression hotlines and access to professional counselors are available without charge at the university where the research was conducted.

Design. We used a one-way, two-level between-subjects design in which we manipulated the order of the self-diagnosis inventory and the elicitation of the

judgments of risk. The format was a *Yes/No* checklist listing all nine behavioral symptoms.

In the first condition, participants were asked to complete the self-diagnosis inventory. They then were asked to rate their own depression, their intention to seek assistance, and their belief in the controllability of depression. In the second condition, they were asked to provide their estimate of depression and intentions prior to completing the self-report inventory.

Measures. To assess self-estimates of risk, participants were asked "On a scale of 0 to 100" (0 = *definitely not depressed* to 100 = *definitely depressed*), how depressed would you categorize yourself?" This was supplemented with a second risk measure: "On a scale ranging from 1 (*not at all likely*) to 7 (*very likely*), please circle a number . . . to indicate how likely it is that you are depressed."

To assess behavioral intentions, study participants were asked "If there were a free Depression Screening Day offered to students, staff, and faculty on campus by the University Health Services, how likely are you to go for screening?" This was rated on a 7-point scale ranging from 1 (*not at all likely*) to 7 (*very likely*), with higher numbers reflecting higher intentions to seek help. Similarly, we measured perceptions of controllability on a 7-point scale ranging from 1 (*not at all controllable*) to 7 (*very controllable*).

Results

Hypothesis 1: Estimates of Risk of Depression. As predicted, on the 101-point probability scale, those who had first completed a checklist reported a significantly higher level of risk of depression ($M = 34.70$), as compared to those who had not ($M = 19.81$), $F(1, 40) = 4.01, p < .05$. The same pattern was present with the 7-point depression scale ($M_s = 3.70$ vs. 2.76), $F(1, 40) = 2.98, p < .10$. Thus, responding to the self-diagnosis inventory increased perceptions of own risk.

Hypothesis 2: Behavioral reports. Hypothesis 2 predicted that people would be less likely to identify a behavior categorized as a symptom of depression if they already had judged themselves as being at low risk of depression. We examined this hypothesis in two different ways. First, we categorized respondents using the DSM-IV (APA, 2000) criterion: If they had checked at least six symptoms, including Symptoms 1 or 2, they were categorized as being at risk.⁵ The proportion of respondents who were categorized as being at risk was then examined across the two conditions.

⁵The pattern of results is identical if the DSM-IV cutoff used is five behaviors, of which one must be Symptom 1 or 2. We used six symptoms for categorization in this study that used all nine symptoms to allow comparison with later studies in which the "thoughts of suicide/death" behavioral symptom was omitted from the inventory, leading to a total of eight behaviors. For those studies, given the overall low likelihood of responding *Yes* to the suicide question, we used a cutoff of five behaviors.

Table 1

The Effect of Completing a Self-Diagnosis Inventory on Behavior Interpretation and Risk Assessment

Measure		Effect of order of elicitation	
		Symptoms elicited prior to risk estimate	Risk estimate elicited prior to symptoms
Behavior identification	“At risk,” per DSM-IV classification (%)	40.00*	9.50
	Behavioral symptoms engaged in (<i>M</i>)	4.65*	3.09
Self-reported risk estimate	Probability (101-point scale)	34.70*	19.81
	Likelihood (7-point scale)	3.70†	2.76
Behavioral intention	Intention to get screened for depression (7-point scale)	2.50	2.76
	Intention to go to a doctor (7-point scale)	1.95	2.14
Perceived controllability of depression		4.95	5.24

Note. DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; APA, 2000).

† $p < .10$. * $p < .05$.

Supporting a theory of behavior interpretation, we found that in the condition where self-reports were elicited after risk judgments, the proportion of respondents who checked symptoms that would place them in the at-risk category fell from 40.0% to 9.5%, as compared to when the behavioral self-reports had been elicited first, $\chi^2(1, N = 41) = 5.16, p < .05$.

Second, we examined the average number of symptoms checked off by participants as a function of whether they estimated their risk first or identified their behaviors first. The order of administration of the self-diagnosis inventory was significant, $F(1, 40) = 4.19, p < .05$; with more behaviors identified when the inventory preceded ($M = 4.65$) elicitation of risk estimates, as compared to when the inventory followed it ($M = 3.09$). Therefore, Hypothesis 2 was supported.

There were no effects of experimental condition on intentions or judgments of the controllability of depression (all F s < 1 ; see Table 1 for means). Thus,

behavior identification and risk assessment may be insufficient to encourage people to seek assistance.

Discussion

These results suggest that getting people to accept risk, which is effective at generating help-seeking behavior in the domains of AIDS (Raghubir & Menon, 1998, 2001) and Hepatitis C (Menon et al., 2002), may be inadequate to prompt preventative action in the domain of depression. Central to this issue is the question of the ambiguity of the behaviors symptomatic of depression. Study 2 investigates a possible antecedent of this: whether the set of behavioral symptoms included can influence the diagnosticity of the symptoms themselves.

Study 2: Altering the Diagnosticity of Behavioral Symptoms

The objective of Study 2 is to examine the effects of behavioral symptoms included in the self-diagnosis inventory on judgments of the diagnosticity of behavioral symptoms for depression (Hypothesis 3). We proposed that the perceived strength of depression symptoms (in diagnosing depression) would be contingent on their diagnosticity relative to other symptoms presented on the same self-diagnosis inventory. When a symptom with greater causal clarity relative to the others, greater extremity of consequence, lower frequency, and lower measurement error (i.e., “suicide/death”) is present, then the remaining symptoms that are more ambiguous will be judged as less diagnostic.

Method

One hundred undergraduates participated in this study for partial course credit. We used a 2×2 (Extreme Behavior—“Thoughts About Suicide/Death”: Included vs. Excluded \times Information About DSM-IV Guidelines: Present vs. Absent) between-subjects design.

Participants were assigned at random to one of four experimental cells. They were given a brief introduction to depression, as in Study 1, and then were either given the DSM-IV (APA, 2000) guidelines or not, depending on the feedback condition to which they were assigned. Participants then rated each of the eight (or nine, including “thoughts of suicide/death”) behavioral symptoms on whether they believed that each symptom was indicative of being depressed. These ratings were elicited on a 7-point scale ranging from 1 (*not at all indicative*) to 7 (*very indicative*).

Results

Assessing Diagnosticity of the Extreme Behavior. We first examined whether “thoughts of suicide/death” is, in fact, perceived to be more diagnostic

of depression than the other symptoms. In the condition in which this symptom was included, the mean rating for the suicide symptom was 6.23 on a 7-point scale, which is significantly greater ($p < .05$) than the means of seven of the remaining eight symptoms, except feelings of guilt ($M = 5.86$; Table 2), which was the second highest rated in terms of diagnosticity. Given this pattern, we next examine whether the presence of the suicide symptom led to perceptions of lower diagnosticity for the remaining eight symptoms.

Hypothesis 3: Altering Diagnosticity of Behavioral Symptoms. Hypothesis 3 argued that information about DSM-IV (APA, 2000) guidelines and the inclusion/exclusion of the extreme behavior should interact, such that when there is no information about the DSM-IV classification scheme, the absence of "thoughts about suicide/death" should increase the perceived diagnosticity of the remaining behavioral symptoms on the depression inventory. A 2×2 (Extreme Behavior: Included vs. Excluded \times DSM-IV Guidelines: Present vs. Absent) MANOVA of the eight behavioral symptoms reveals a significant interaction effect, $F(8, 82) = 2.86, p < .01$. The pattern was as hypothesized and is presented separately for each symptom in Table 2.

For ease of exposition, we describe the pattern of results for an index created by averaging the perceived diagnosticity scores of the eight symptoms ($\alpha = .86$). The means for this index are depicted pictorially in Figure 2. When people were not provided with the DSM-IV (APA, 2000) classification information, they believed that the eight behaviors were more diagnostic of depression when suicide was excluded from the inventory ($M = 5.11$), as compared to when it was included ($M = 4.33, p < .05$). However, when the DSM-IV information was provided to respondents, the presence of the extreme behavior did not exert an effect ($M_s = 5.01$ vs. 4.85 for present vs. absent, respectively). The main effect of the DSM-IV classification scheme was also significant, $F(8, 82) = 5.24, p < .01$.

Discussion

The results of this study provide evidence that people deduce meaning from the behavioral symptoms that comprise the inventory. When an extreme behavior is present among more ambiguous behaviors, people deduce that the other symptoms are less diagnostic. However, providing criteria by which classification takes place is effective, not only because it increases the perceived diagnosticity of the ambiguous behavioral symptoms in the inventory, but also because it attenuates the effect of inclusion of extreme behavioral symptoms in the content of the inventory.

While providing DSM-IV (APA, 2000) guidelines is effective at increasing the perceived diagnosticity of the remaining behavioral symptoms, depressives must believe that the symptoms of depression are controllable if they are to seek assistance. The next study examines whether the presence of the extreme behavior affects perceptions of controllability of the remaining symptoms.

Table 2

The Effect of Including an Extreme Behavior in an Inventory on Perceived Diagnosticity of the Remaining Symptoms

Measure	Extreme behavior ^a			
	No information about DSM-IV guidelines		Information given about DSM-IV guidelines	
	Present	Absent	Present	Absent
Index of eight behavioral symptoms	4.33*	5.11	5.01	4.85
Loss of interest or pleasure in activities you used to enjoy (e.g., hobbies, sex)	4.35*	5.23	5.75	5.67
Feeling unusually sad or irritable	4.04*	5.36	5.83*	5.25
Sleep disturbances (e.g., trouble falling asleep, waking up too early, oversleeping)	4.04*	5.18	4.21†	3.63
Decreased ability to concentrate	3.83*	4.68	4.58	4.46
Changes in appetite	4.35	4.68	4.08	4.33
Feeling more tired than usual	4.00†	4.46	4.50	4.25
Feelings of guilt or worthlessness	5.44*	6.14	5.83	6.04
Restless or slowed activity noticed by other people	4.61*	5.18	4.83	5.17
Thoughts about suicide or death	6.36		6.09	

Note. DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; APA, 2000). Each symptom of depression was rated on a 7-point scale ranging from 1 (*not at all indicative*) to 7 (*very indicative*).

^aThoughts of suicide/death.

† $p < .10$. * $p < .05$. The contrasts are between the two experimental conditions where the extreme behavior is present versus absent; separately for the conditions where DSM-IV guidelines were provided vs. not provided.

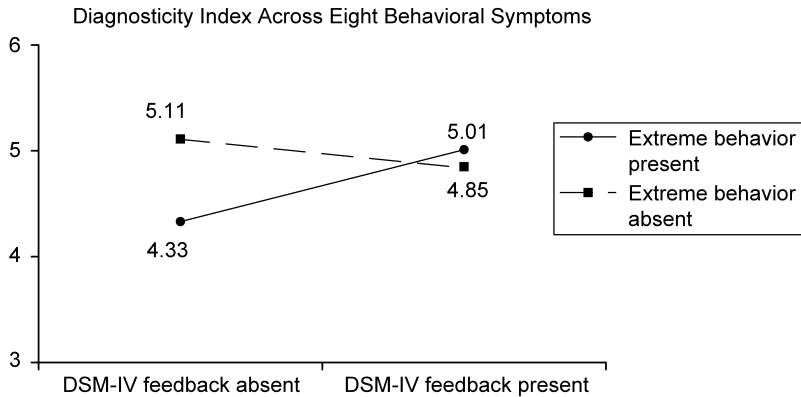


Figure 2. Altering the diagnosticity of the content of a self-diagnosis inventory (Study 2). DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; APA, 2000).

Study 3: Perceived Controllability of Symptoms of Depression

Study 3 explores the consequences of the inclusion or exclusion of extreme behaviors on self-risk estimates and intention to take action. The unambiguously extreme nature of the behavior may operate as a double-edged sword. On the one hand, it may overwhelm perceptions of the diagnosticity of the other symptoms (Study 2); but on the other, its extreme nature may lead to the belief that depression (and its symptoms) is controllable. It should be noted that given that these two routes exert opposite effects on intention to seek help, the net effect on that variable will be contingent on the strength of the two effects and cannot be hypothesized a priori.

Method

Participants were 34 who each received partial course credit. We used a one-way between-subjects design that manipulated (including vs. excluding) the extreme behavior (“thoughts about suicide/death”). Participants were assigned randomly to one of two experimental cells; were given a brief introduction to depression, as in earlier studies; and then were asked to rate each of the eight (or nine, including “thoughts of suicide/death”) behavioral symptoms on whether they believed that each symptom was controllable for a person suffering from depression. These ratings were elicited on a 7-point scale ranging from 1 (*not at all controllable*) to 7 (*very controllable*). They then rated their likelihood of going to a doctor to talk about their own depression and rated their belief in their own likelihood of depression.

Results

As predicted in Hypothesis 4, the presence of "thoughts of suicide or death" increased perceptions in the controllability of the remaining symptoms, and reduced risk estimates and intentions. A one-way multivariate ANOVA on beliefs regarding the controllability of the remaining eight symptoms (using the presence/absence of the extreme symptom as a between-subjects factor) shows a main effect of experimental condition, $F(10, 23) = 2.98, p < .05$.

All eight behavioral symptoms were rated as more controllable when the suicide symptom was present versus absent from the inventory (Table 3). The presence (vs. absence) of the suicide symptom reduced the belief that a person was at risk ($M_s = 2.38$ vs. 3.72), $F(1, 32) = 5.63, p < .05$.

Intention to seek assistance was in the same direction as estimated risk, but showed a weaker effect ($M_s = 2.12$ vs. 3.00 for present vs. absent, respectively), $F(1, 32) = 3.59, p < .07$. This presumably reflects the opposing effects the presence of this symptom has on beliefs of controllability versus beliefs of diagnosticity (Study 2).

Discussion

The results of this study provide further evidence that people deduce meaning from the behavioral symptoms that comprise a depression inventory. They highlight the potential problem associated with dropping an extreme behavioral symptom from the set. At a theoretical level, the results of this study suggest that the content of the behavioral inventory serves an informative function that can translate into a persuasive role. These results add to the literature on cognitive aspects of survey methods showing that the manner of construction of a questionnaire affects the reports elicited and can, in turn, affect later responses (for a review, see Sudman, Bradburn, & Schwarz, 1995).

General Discussion

Implications for Survey Methodology and Questionnaire Design

Three studies systematically examined how the presence and construction of self-report inventories can assist respondents in identifying and interpreting behavioral symptoms, affecting beliefs as to whether symptoms are diagnostic of depression and whether they are controllable. Consequently, the self-diagnosis inventory affects the perception of own risk and intention to seek assistance.

Study 1 began by showing that merely administering an inventory has a positive persuasive effect and increases people's perceptions of their own risk. Studies 2 and 3 examined the effect of inclusion/exclusion of a single extreme

Table 3

The Effect of Including an Extreme Behavior in an Inventory on Perceptions of the Controllability of the Remaining Symptoms

Measure	Extreme behavior ^a	
	Present	Absent
Intention to see a doctor (7-point scale)	2.12†	3.00
Self-reported risk estimates (7-point scale)	2.38*	3.72
Perceived controllability of each behavioral symptom ^b		
Loss of interest or pleasure in activities you used to enjoy (e.g., hobbies, sex)	4.38	3.72
Feeling unusually sad or irritable	4.19	3.28
Sleep disturbances (e.g., such as trouble falling asleep, waking up too early, oversleeping)	4.25†	3.17
Decreased ability to concentrate	4.19*	2.78
Changes in appetite	3.63†	2.61
Feeling more tired than usual	4.25†	3.11
Feelings of guilt or worthlessness	4.38	3.61
Restless or slowed activity noticed by other people	4.81*	3.22
Thoughts about suicide or death	3.59	

^aThoughts of suicide/death. ^bRated on a 7-point scale ranging from 1 (*not at all controllable*) to 7 (*very controllable*).

† $p < .10$. * $p < .05$.

behavior symptomatic of depression (i.e., thoughts of suicide or death), along with the eight-item inventory. The results show that the presence of the extreme behavior allowed potential for interpreting the remaining behavioral symptoms and allowing respondents to self-select out of the at-risk category. While Study 2 showed that the extreme behavior reduced the diagnosticity of the behavioral responses of the eight other behavioral symptoms in the list, Study 3 showed that the behavioral symptom “thoughts of suicide or death” is a double-edged sword, with its presence persuading people that symptoms of depression are more controllable. This positive effect on risk estimates conflicts with the negative effect on perceived controllability. Across the studies, the evidence suggests that the

manner in which one asks a question affects the manner of use of a self-diagnosis inventory, and further affects the manner in which the inventory is used to make judgments about the risk of depression.

Implications for Self-Diagnosis Inventories in General

The results of the three studies reported in this paper help to delineate the process by which people answer questions in a self-diagnosis inventory. Understanding this process enables us to better design these inventories such that the self-reports that are generated can be higher in validity. The implications of this research are that response formats (checklists vs. subjective frequency scales) lead people to interpret behavioral symptoms differently. Further, the presence of an extreme behavior in the checklist allows people to self-select themselves out of the at-risk category.

At a general level, we showed that people differ in the likelihood of reporting susceptibility to behavioral symptoms with extreme consequences. Those who are susceptible to behavioral symptoms with extreme consequences and those with moderate consequences should be able to spot their risk level accurately. However, those who are prone to either of the two types of behavioral symptoms may be at risk, but may not be cognizant of their susceptibility because they can categorize themselves as not at risk for a subset of the behavioral symptoms presented in a self-diagnosis inventory. Such a group exists for depression, as demonstrated in this paper.

The issue of self-diagnosis has implications beyond depression. There is a genre of physiological health problems that are diagnosed using self-reported psychological inventories. Besides depression, these include alcoholism and attention-deficit disorder (ADD) syndrome. *Alcoholism* is defined by Alcoholics Anonymous (Alcoholics Anonymous World Services, Inc., 1998) as an allergic physiological reaction to the consumption of alcohol, with the consequence of an inability to stop drinking once the first drink has been consumed. ADD is another psychological disease with a physiological basis, relying on self- and other inventories. These inventories invariably rely on a set of behaviors characteristic of the malady. The findings of the present research apply to problem detection in these domains, too.

For example, in the context of alcoholism, binge drinking is a behavior with extreme consequences that is often used in a self-diagnostic inventory together with a behavior such as daily drinking, which has less extreme consequences. Behaviors associated with alcoholism are unambiguous, but differ in terms of their extremity. On the other hand, behaviors associated with ADD differ in terms of their ambiguity, but are less extreme. Examining whether the effect of including/excluding different behaviors from self-diagnosis inventories replicates to these contexts would help disentangle whether it is the extremity of the

consequences of a behavior, its lower likelihood of being engaged in, or its relatively lower ambiguity that leads to the effects noted.

Other diseases also rely on self-diagnosis at an initial stage. For example, symptoms of Type I diabetes include “increased thirst and urination, constant hunger, weight loss, blurred vision, and extreme tiredness” (WebMD, n.d.). Note that these symptoms are not unlike the ambiguous symptoms of depression. Type II diabetes is characterized by “feeling tired or ill, frequent urination (especially at night), unusual thirst, weight loss, blurred vision, frequent infections, and slow healing of sores” (WebMD, n.d.). The symptoms of Type II diabetes “develop gradually and are not as noticeable as in Type I diabetes” (WebMD, n.d.). Notably, the list omits tingling hands and feet, a symptom that is less ambiguous and shares many of the characteristics of the “thoughts of suicide/death” symptom in the depression inventory (i.e., it has high causal clarity and low frequency, and it is a present/absent event, rather than a state).

Signal Detection Theory Implications

The primary contribution of this research to SDT is the idea that the detection potential of a signal is contextually determined. It is a function of the other signals that surround it as well as its own innate ability to predict. The concept that signals vary as a function of their degree of existence is conceptually similar to SDT’s threshold of detectability.

In the current context, we argue that symptoms that are not easily categorized by their presence or absence, but operate instead on a continuum, can be interpreted differently by different people in different contexts. The degree of existence of a symptom is an innate aspect of a signal, but the manner in which it is perceived to be informative is determined contextually. We also propose that the consistency between an event occurring and how frequently it is expected to occur affects the perceived strength of a signal. As the expectation of occurrence is itself a function of whether the event is a state of being or a specific event, specific events are perceived to be stronger signals than are states of being. Drawing the parallels between SDT and how consumers use symptoms to self-diagnose suggests a novel new approach to study how people judge the likelihood of an event in the future, at present (as in this paper), or retrospectively in the past.

Consumer Welfare Implications

The context in which we tested these effects was depression. Depression is estimated to affect 9.5% of the population in any 1-year period, or about 18.8 million Americans (Robins & Regier, 1990). Major depression is the leading cause of disability worldwide (Murray & Lopez, 1996; National Institute of

Mental Health, 2003). Depression has been linked with cancer, HIV, smoking, substance abuse, osteoporosis, stroke, and heart disease (Cargill, Emmons, Kahler, & Brown, 2001). It is associated with heavy economic (\$30 billion to \$40 billion per year) and social costs (National Institute of Mental Health, 2003); and encompasses the loss of time and productivity, personnel replacement, medical care, and loss of life (The International Foundation for Research and Education on Depression, 2005).

The World Health Organization's *World Health Report 2000* (as discussed on their website) concludes that depression claims more years than war, cancer, and HIV/AIDS together (World Health Organization, 2005). It is second only to heart disease as the highest cause of lost working days in the United States. Some estimate that as many as 72% of people in the workforce are depressed. Many have been concerned with its near epidemic-like rise over the last few decades, with younger cohorts reporting an increasingly higher incidence of depression (Murray & Lopez, 1996). Depression also has been linked with other behavioral symptoms with adverse health consequences, such as sex, alcoholism, and smoking ("Sizable Chunk of Smokers," 2000). While women have been found to be more prone to depression, this may simply reflect their higher likelihood of seeking assistance. In fact, the psychosocial implications of being depressed may be worse for men because of the greater stigma attached to depression for this category (Russell, 2000).

About half of those estimated to be at risk of depression do not seek assistance. In addition, untreated depression has been documented as the leading cause of suicide, which is the third leading cause of death for 15- to 24-year-olds generally (National Institute of Mental Health, 2003), as well as college students (Jamison, 1999). NIMH (National Institute of Mental Health, 2003) reported that 90% of suicides are attributable to depression or another diagnosable substance-abuse or mental disorder. The issue at hand is why people at risk of serious depression do not seek assistance, especially since anti-depressant drugs have been shown to be effective as much as 80% of the time, particularly when taken along with professional therapy.

A number of online sites target the detection of depression (e.g., www.wingofmadness.com, www.pslgroup.com, www.depression.com, www.nimh.nih.gov/publicat/depressionmenu.cfm, www.depression-screening.org/screeningtest, www.nmha.org/ccd/index.cfm, www.ndmda.org, and www.med.nyu.edu/Psych/screens/depres.html). These sites actively recommend that website visitors seek help if their "depression score" is above a certain threshold after they self-administer the depression inventory. Each website has a battery of questions that are self-administered.

Advertisements encouraging people to go for screening or to talk to their doctor also use some form of a self-diagnosis inventory. A recent advertisement by Long's Drugs, a national retailer, highlighted the nine symptoms of depression

(Appendix A) and urged the reader to seek medical advice if “they” or “someone they knew” suffered from any of them. The results of this paper show that the format and content of these inventories should be chosen with care.

Areas for Future Research

The symptom “thoughts of suicide or death” is a double-edged sword: While on the one hand its presence decreases perceptions of the diagnosticity of the remaining behavioral symptoms, its absence reduces perceptions of the controllability of depression symptoms. As both risk perceptions and beliefs in controllability are key to persuading people to seek assistance, it may be necessary to retain the extreme behavior in the inventory while mitigating the effect it has on perceptions of the diagnosticity of the remaining eight symptoms.

If perceptions of controllability show an opposite effect to those of risk perceptions, the net effect on behavioral intentions may mirror self-risk estimates, rather than the pattern for perceived controllability. This is consistent with prior literature that has shown that self-risk estimates are higher when an event (e.g., cancer) is perceived to be less controllable (Lin et al., 2003a). This leads to a reduction in the self-positivity bias. Lin et al. argued that this is because an event over which an individual does not have much control does not implicate one’s self-esteem. Therefore, accepting a higher risk level for such an event is easier in terms of the motivation for self-esteem maintenance than is accepting higher risk levels for an event of which an individual believes he or she can control the outcome.

It is possible that respondents will answer in terms of their perception of control of contracting the disease, rather than perception of control of curing the disease. Ways to retain the positive effects of a symptom (i.e., belief that the disease is curable) while mitigating its unfavorable effects (i.e., belief that the symptom does not cause the disease) is presented as an area for future research.

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Appendix A

*Depression Symptoms (Diagnostic and Statistical
Manual of Mental Disorders-IV)*

1. Loss of interest or pleasure in activities you used to enjoy, such as hobbies or sex
2. Feeling unusually sad or irritable
3. Sleep disturbances such as trouble falling asleep, waking up too early, or oversleeping
4. Decreased ability to concentrate
5. Changes in appetite
6. Feeling more tired than usual
7. Feelings of guilt or worthlessness
8. Restless or slowed activity noticed by other people
9. Thoughts about suicide or death

A person is categorized as “At risk of depression” if they have either symptom 1 or 2, and at least 5 of the other symptoms in the checklist.

Appendix B

Information Provided About Depression
(National Institute of Mental Health, 2003)

Depression is a medical illness that can disrupt your life. It involves your whole body and affects your thoughts, emotions, behavior, and the way you feel about yourself. More than 18 million Americans suffer from some type of depression, and 1 in 8 people needs treatment for depression during his or her lifetime. Depression is not a character flaw. It is not a “mood” or a personal weakness that you can change at will or by “pulling yourself together.” Depression is one of the most underdiagnosed diseases in the United States.

There are many types of depression. One of the most serious types of depression is called *major depression* and is associated with the second leading cause of teen deaths: suicide (accidents are the first). There are other, less extreme forms of depression. One such form is *dysthymia* (a low-grade depressive state associated with minor levels of symptoms, but continuing over a long period of time, often years). Another type of depression is *seasonal affective disorder* (SAD), which is associated with lack of sun in the winter months.

Depression is diagnosed by a trained medical practitioner (e.g., psychiatrist). However, the only way people can be diagnosed is if they feel that they may be at risk and meet with their doctors. The fortunate news is that depression is treatable—using drugs, counseling, and other medical interventions. If you or anyone you know may be at risk for depression, it is recommended that you speak to your doctor. Should you feel the need to speak to a counselor on campus, please call the counseling services at the University Health Services.