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Development and Initial Validation of a Structured Interview for the Detection of Malingered Mild Head Injury

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**DEVELOPMENT AND INITIAL VALIDATION OF A
STRUCTURED INTERVIEW FOR THE DETECTION OF
MALINGERED MILD HEAD INJURY**

BY

MARGARET ANNE ACKLEY

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
PSYCHOLOGY**

UNIVERSITY OF RHODE ISLAND

2000

DOCTOR OF PHILOSOPHY DISSERTATION

OF

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Abstract

Neuropsychologists often assess individuals involved in litigation, and who may be in a position to obtain significant financial compensation. Malingering measures are often employed in these assessments, however, the accuracy of these measures may be less than satisfactory. Most malingering measures are not targeted to mild head injury, a very common type of claim. The goal of this research was to begin the development and validation of a measure specifically designed to detect malingering of mild head injury symptoms. More accurate assessment can help identify false claims, and also establish the merit of genuine claims.

A 472-item questionnaire was developed by three writers based on knowledge of head injury sequelae and malingering detection techniques. This questionnaire contained both common, plausible symptoms following injury, and implausible symptoms. Malingering individuals may not only overendorse true symptoms, but may identify implausible symptoms or deny positive attributes in an attempt to appear impaired.

The ability of this questionnaire to discriminate between individuals answering honestly and individuals faking mild brain injury was evaluated in a classic simulation study with a university sample. Participants ($N = 330$) were instructed to either respond honestly to the items (honest responders) or to respond as if they had sustained a mild brain injury and were attempting to demonstrate deficits in order to receive financial compensation (malingering responders).

Malingering responders scored significantly and substantially higher than the honest responders on the questionnaire. Cutoff scores accurately classified approximately 95% of participants, with high rates of sensitivity and specificity. Results

of cross-validation analyses indicated that total scores on the questionnaire may have good cross-situational consistency. And, an analysis of within-subject response consistency over a relatively short period of time suggested that individuals answering honestly produced more consistent responses over time than malingering responders.

Overall, this measure shows promise in discriminating honest responders from those feigning mild brain injuries. Future research will focus primarily on the questionnaire's ability to distinguish individuals with true head injury sequelae from other populations, such as those involved in litigation and individuals with disorders similar in symptom presentation to mild head injury (e.g., toxin exposure and depression).

Acknowledgment

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Introduction

Statement of the Problem

In neuropsychology, the problem of malingering has been given much attention in recent research. Malingering, as defined by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), is the “intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs” (DSM-IV; American Psychiatric Association [APA], 1994, p. 683). Whether or not the DSM-IV description is deemed acceptable, at least two dimensions seem essential to the definition of malingering, intentionality and misrepresentation of symptoms (Faust & Ackley, 1997). A person can be considered to be malingering when they are intentionally misrepresenting symptoms of a disorder.

Both intentionality and misrepresentation appear necessary because, for example, information can be misrepresented unintentionally secondary to normal human shortcomings or the presence of disorder, versus the feigning of disorder. For example, someone may have difficulty recalling the specifics of an accident due to a concussion and resultant post-traumatic amnesia. In addition to the two dimensions noted, the definition of malingering is value laden. An individual may pretend to be unconscious in order to avoid being further injured in a robbery attempt. This example does not capture the usual, intended meaning of malingering, or at least the type we are most concerned about societally. Malingering involves deceit for some type of personal gain, often at the expense of some other party. A more appropriate example would be someone feigning

symptoms of brain damage to obtain some form of compensation for their injury, be it a case involving worker's compensation, personal injury, or social security disability.

Neuropsychologists often assess individuals who are in litigation, and who may be in a position to obtain significant financial compensation. Research suggests that normal individuals simulating brain impairment on neuropsychological instruments can produce profiles that trained professionals judge to reflect genuine abnormality, and that the rate of error in detecting malingering may be considerably greater than one would hope (e.g., Faust, Hart, Guilmette, & Arkes, 1988; Heaton, Smith, Lehman, & Vogt, 1978). Malingering measures are increasingly implemented in forensic assessments, however, the accuracy of these methods may be less than satisfactory, or their status remains experimental (see Faust & Ackley, 1997).

Most present malingering measures are not targeted at mild head injury, a very common type of claim, or they assess cognitive performance exclusively. It is highly unlikely that those malingering mild head injury will limit their "efforts" to cognitive measures, and rather will also feign symptom reports. In fact, some individuals will exclusively malingering when reporting symptoms, as might be the case when certain cognitive shortcomings are present but are falsely attributed to an accident. Further, much research across wide areas in psychology shows that maximal judgment accuracy is typically achieved by properly combining multiple, non-redundant, sources of valid information (although perhaps fewer, or far fewer, such variables than many suppose, see Dawes, 1971). For these reasons, it seems likely that an interview format specifically aimed at identifying malingering of mild head injury could prove helpful. The goal of the current research program was to begin the development of such a measure. More

accurate identification of veracity can help not only to identify disingenuous claims, but to establish the merit of genuine claims.

Intended Purpose of the Measure

The current research aims to create a questionnaire that can distinguish between individuals who present feigned versus genuine symptoms of mild head injury. The measure is not presently intended to necessarily differentiate the factors underlying such misrepresentation. As mentioned, there are numerous reasons, both unintentional and deliberate, why information may be misrepresented. For example, as defined in the DSM-IV (APA, 1994), Somatoform Disorders involve the presentation of physical symptoms that lack an adequate, or any, medical basis. Individuals with such disorders are preoccupied with having a disease and may grossly misperceive, unintentionally, their own bodily sensations or level of functioning. Thus, a deviant result on the measure may well signal the likelihood of over-reporting or misrepresentation, but not necessarily distinguish among possible causes. Whether the measure has the potential to make such differentiations, for example, by examining response patterns in conjunction with other sources of information, will require research beyond the scope of this project.

Individuals may use various approaches when attempting to fake disorder. For example, an individual may malingering based on his or her own general knowledge of a disorder, may receive help from others in faking a problem, or may read literature to learn the characteristics of the disorder to be feigned. Also, as discussed below, there are many approaches individuals may take in order to create the impression that an injury has caused their problems. The present measure, at this point in its development, is not intended to tease apart the mechanisms by which an individual is misrepresenting his- or herself, but to

determine when results are inconsistent with the honest reporting of mild head injury symptoms.

Mild Head Injury

According to epidemiological data, head injury is the most common acute neurological disorder in the U.S., and about 80% of head injuries are classified as mild (Kraus & Sorenson, 1994). Most individuals who sustain a mild head injury, although perhaps experience initial symptoms, recover relatively quickly and can resume normal daily functioning. However, some patients have continuing problems with such symptoms as headaches, dizziness, and memory loss that can last for many weeks, several years, or even permanently. The constellation of resultant symptoms are frequently referred to as post-traumatic, or post-concussive syndrome (PCS), although it might be noted that relative uniformity in definition, and even clarification of syndromal status, await further development.

There is, however, relative agreement that symptoms following mild head injury, whether grouped under the label of PCS, can include physical problems (headaches, lightheadedness, fatigue, tinnitus), cognitive deficits (impaired memory, distractibility, impaired ability to comprehend), and emotional changes (apathy, irritability, anxiety, mood lability, depression). These symptoms can vary in intensity, number, type, and duration (Speed, 1989). PCS can not only negatively impact the lives of individuals, but can affect their families as well (Johnson & McCown, 1997).

Unfortunately, there is usually no objective medical means to identify PCS. Rather, diagnosis is typically based on a combination of patient self-report and cognitive/neuropsychological testing, both of which, to produce legitimate results, require

cooperation. Many cases of head injury are embroiled in legal claims with large financial stakes, raising the concern that individuals will exaggerate or fake disorder, and do so successfully, given the current state of diagnostic methods. Alternatively, and of at least equal concern, individuals with legitimate injuries may be misclassified as malingerers.

Approaches of Malingers

It is difficult to measure malingering because, among other things, not all malingerers are likely to deceive in the same way. Individuals who are asymptomatic may fake symptoms in order to deceive. Others may exaggerate symptoms that they have, or pretend that symptoms are still present after these problems have abated. Individuals may misrepresent the true cause of their symptoms. For example, an individual may have true memory deficits, but she may try to convince professionals that the deficits are due to a head injury when they are really due to a long history of substance abuse and were present before the injury. A person may intentionally deceive by claiming a false baseline, for example, reporting that he had an excellent memory pre-injury, when in reality the opposite is true. The intent is to create the impression that a decline in functioning has occurred when it has not. A person may attempt to fake a disorder by denying positive attributes, i.e., before the head injury, she may assert that everything in life was ideal, and now everything is problematic. Finally, a person may not put forth adequate effort on testing in order to appear impaired. For example, he or she may not work as fast as possible on timed measures, or may deliberately miss items. It cannot be assumed that these and other approaches are all highly associated with each other, that is, that a person using one such strategy will equally employ various other strategies as well, or that individuals would all use the same strategies.

Approaches to Detecting Malingering

If individuals malingering in different ways, it appears unlikely that narrow approaches to malingering detection, that are designed to uncover only one or a few strategies, will achieve adequate sensitivity. A combination of methods, when combined or integrated properly (e.g., via actuarial methods), will most often be more accurate than a single method alone. Currently, most malingering detection methods can be roughly classified as falling within one of two groups: a) objective personality tests (which can be considered a type of structured interview method), for which scores are usually tallied and compared to normative standards, and b) performance-based measures. Current interview methods are primarily aimed at detecting individuals malingering psychopathology. On the other hand, most performance measures are used for detecting feigned cognitive deficits.

The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1983) is the most frequently used method for detecting individuals faking psychiatric disorder. The F scale of the MMPI, for example, capitalizes on stereotypes regarding psychopathology, the idea being that malingerers will endorse items based on faulty knowledge. The F scale contains items that describe symptoms that laypersons are prone to falsely associate, or over-associate, with psychopathology. A markedly elevated score on the F scale may be indicative of malingering. Meta-analyses looking at MMPI malingering scales identified the F scale as among the best measures of over-reporting (Berry, Baer, & Harris, 1991); and meta-analyses of the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) have yielded similar results, although there may be some shift in the relative sensitivity of the various malingering scores, and more so in the normative standards that should be applied (Rogers, Sewell, & Salekin, 1994).

An earlier study suggests that the MMPI may be useful in identifying individuals feigning neuropsychological deficits (Heaton, Smith, Lehman, & Vogt, 1978); and, in fact, the MMPI is often used as a malingering measure in neuropsychological evaluations. Subsequent studies, however, have produced mixed results, with a general association usually found between faking neuropsychological disorder and elevations on MMPI scales, but with considerable variation in the strength of these associations (e.g., see Berry & Butcher, 1998). There are probably complex methodological reasons for these varying findings, but they again suggest heterogeneity in malingering strategies, and the fact that a malingering measure primarily relying on overendorsement of the emotional sequelae of head injury (at least as presently designed) will tend to miss malingerers who do not emphasize both direct neurological and affective components.

A second interview approach, which has been constructed specifically to detect malingering, is the Structured Interview of Reported Symptoms (SIRS; Rogers, Bagby, & Dickens, 1992). The SIRS was constructed for use with psychiatric patients. Unlike the self-administered MMPI, the SIRS is administered in a structured interview format. It consists of eight primary scales and five supplementary scales, which are intended to tap into different deception strategies an individual may use and different approaches to detection. For example, the scales include rare or improbable symptoms, symptom combinations that rarely occur together, and symptoms that untrained individuals are likely or unlikely to associate with psychopathology. High endorsement on these types of symptom scales point toward possible feigning. Like the F scale, the SIRS capitalizes on an individual's possible stereotypes and misinformation. It also takes into account consistency of responding within the measure and atypical changes in the course of the

disorder. Thus, construction of the measure took into account the possible heterogeneity of malingering strategies and hence the need for multiple approaches to detection. This measure has been validated on a variety of populations, however, it was not designed to assess malingering of neuropsychological dysfunctions, and therefore, has not been appraised for this purpose.

As noted above, most measures for feigned neuropsychological dysfunction target cognitive performances. One such approach is to evaluate if the individual is performing as well as she can on a specific measure. Symptom validity testing (Pankratz, 1988) is based on this approach. Symptom validity testing, sometimes referred to as “forced-choice testing,” presents an individual with a forced-choice task, and by one possible criterion, the person’s “effort” is considered inadequate if it falls significantly below chance levels. If a person can produce scores significantly below chance levels, then they must be consciously answering incorrectly in order to appear impaired, that is, production of below chance performance requires recognition, and withholding of, correct responses. These methods have been used for various sensory and cognitive deficits, but are most often used to assess memory impairments. One strength of this method is that a positive result, that is when an individual’s performance falls well below chance levels, strongly suggests a purposeful attempt to fake impairment and is relatively unambiguous. One criticism of this method is its transparency. Individuals who are attempting to deceive may discern the detection strategy and perform normally on the measure, or at least not below chance levels. Research, in fact, tends to show low sensitivity (Rogers, Harrell, & Liff, 1993). Further attempts at refinement, such as varying the number of potential responses to make cognitive tracking of performance more difficult, may well lead to increases in

detection rate. Also, attempts have been made to adjust cutoff scores to increase sensitivity without impacting too severely on specificity. For example, even individuals with serious brain injury tend to miss few items, and cutoff scores that identify implausibly poor performance show some promise (Binder, 1993; Guilmette, Hart, & Giuliano, 1993).

Some researchers have examined whether detection strategies can be designed for, or derived from, current neuropsychological batteries (e.g., Reitan & Wolfson, 1997).

Reitan and Wolfson's promising approach measures inconsistencies in responding that are not expected on a neurological basis and can result from an individual's inability to recall the pattern of "dysfunction" they feigned previously, secondary to normal limits of human memory. Reitan and Wolfson examined both the consistency of scores and item responses on retesting. Their research suggests that individuals involved in litigation are less likely to produce consistent scores on retesting than those not involved in litigation, mainly due to a tendency to fail items previously passed, whereas true deficits following head injury are more likely to show consistency or improvement over time in line with the expected course of recovery.

The Current Research Project

As noted, it is unlikely that all individuals with intent to deceive will use the same approach to appear impaired. Currently, there are several methods that aid in the detection of malingered psychological disorder (e.g., the MMPI scales and the SIRS). There are also several methods aimed at detecting malingered cognitive deficits (e.g., symptom validity testing, and examining for performance inconsistencies on neuropsychological tests). Given that individuals may choose to mangle only some types of symptoms, on only certain measures, it is most likely that multiple detection methods,

properly combined (e.g., via actuarial judgment), will achieve greater accuracy than a single measure. Currently, there is no method that specifically capitalizes on what is known about the symptoms and course of mild head injury. The goal of the current research is to begin development of an interview-based measure that is similar in format and strategy to the SIRS and the F scale of the MMPI, but that is targeted specifically at the detection of feigned impairment from mild head injury.

The present research included three phases: a) preliminary item generation, b) a community survey to aid in further item generation and refinement, and c) an initial validation study, hereafter referred to respectively as: Item Generation, Community Survey, and Validation Study. In the Item Generation phase, items were generated based on literature about the sequelae following mild head injury, malingering detection strategies, and information bearing on public conception and misconception of head injury. For example, misconceptions about mild head injury might well be endorsed by individuals attempting to feign symptoms, but not by those with genuine symptoms.

The second phase of this research, that is, the Community Survey, was designed to further knowledge regarding lay views about head injury. This information was to be used to further design and refine “expectation-based” items. Past studies have examined laypersons’ knowledge of head injury, but have involved impressions about very general symptoms (e.g., headaches) rather than about more specific symptoms that can be used to capitalize on malingerers’ faulty beliefs and lack of knowledge. The current Community Survey included common symptoms of mild head injury, and also symptoms which, in actuality, are highly unlikely to occur after a head injury but might be perceived as plausible. The survey also examined beliefs about the course of these symptoms over

time, including, in particular, when the symptoms will improve, if ever, again exploring for possible common misconceptions. For example, although symptoms following mild head injury usually improve over time and often remit, malingering individuals may think that various symptoms will worsen over time.

This Community Survey also explored laypersons' ability to differentiate symptoms of mild to moderate head injury from other disorders that can affect neuropsychological functioning, specifically dementia and depression. Symptoms of mild head injury are often ambiguous and nonspecific, as are symptoms of many disorders. For example, attention and concentration problems may be present in cases of brain damage, physical illness, or psychological disorder. Although asking about possible symptoms of head injury, previous surveys with laypersons have not evaluated the ability of individuals to distinguish between disorders. Thus, for example, the seemingly accurate or informed responses sometimes obtained in those surveys may or may not reflect genuine knowledge of head injury as opposed to relatively undifferentiated stereotypes about neurological disorders. As the main purpose of this part of the Community Survey was separate and apart from the dissertation, it will not be described further.

Following the creation and refinement of items, the third phase of the research, the Validation Study, was conducted. Using a college student population in a classic simulation study, half of the participants were instructed to respond to the questionnaire items honestly, and the other half to respond as if they had sustained a mild head injury and were attempting to demonstrate deficits in order to receive financial compensation. This phase of the research was intended to evaluate the potential discriminatory power and characteristics of the items.

These steps in item generation and validation, which comprise the dissertation, are certainly not viewed as complete development and testing of this measure, although they would seem to be reasonable starting points. Ultimately, the intended purpose of the measure is not to distinguish between normal individuals faking or not faking disorder, but individuals feigning the symptoms of head injury versus those with genuine head injury. It was hoped that as part of this early validation work, a small group of head-injured individuals could be recruited to begin this next stage of research. Given the difficulty of recruiting such a sample, and the intended and realistic scope of a dissertation, it was described as a supplemental study to be conducted if feasible, and was not part of the formal research proposal. Participants for this supplemental study were recruited through undergraduate psychology courses, and involved individuals that experienced genuine head injuries. Participants in this phase of the research were either asked to answer the questionnaire honestly regarding any current symptoms resulting from their head injury, or, alternatively, to exaggerate their symptoms, as if they were pretending to have more severe deficits in order to maximize financial compensation for their injury. The analyses for this study were originally intended to examine whether the items could distinguish between the two response sets, and investigate the properties of the scale. Unfortunately, not enough individuals with recent head injuries were recruited to complete this supplemental study, and therefore it will not be described further.

Phase I. Item Generation

Method

Procedure. Item generation was initially conducted independently by three individuals including the author, David Faust, Ph.D., and David Strong, Ph.D. (a local

psychologist who is working with the research team). Items were based on information regarding possible symptoms of mild to moderate head injury and approaches to identify malingerers. In order to generate a diverse pool of potential questions, items were not examined together until each writer had generated a relatively large number of items.

Items were combined to form an initial item pool of approximately 400 items. It was unclear in advance what questions would be more or less useful, and consequently, at this point, inclusion of possible items was more important than the exclusion of items. All of the items were worded in order to use a dichotomous response format. A dichotomous format reduces administration time, while still providing adequate variability given the large number of items to be initially examined. Whether the response format might need to be changed for some or all of the questions was to be decided as information was gathered about the measure.

Items were grouped by content area in order to facilitate revisions. The initial item pool was reviewed for coverage of the content domain. There was a wide variety of items covering probable and improbable cognitive, emotional, and somatic symptoms that could arise following head injury. Many of the items were designed to appear plausible to laypersons, but, in truth, were improbable or highly improbable judging from scientific knowledge about head injury. An example of such an improbable item is: "When people speak to fast, I get dizzy." Also, a large number of items were designed to be rather extreme, such as, "My coordination is so bad that I can hardly pour a drink without spilling it." These improbable and extreme items were included because they may seem plausible to malingerers, given stereotypes about head injury. Further, because such items are likely to be endorsed rarely by honest responders with true head injury, even modest

endorsement rates by malingerers should contribute to accurate identification. Items also addressed behavioral changes, normal human shortcomings, and socially desirable characteristics. Items such as these were included because, along with over-reporting symptoms, malingerers may fail to acknowledge normal human shortcomings in an effort to present themselves as overly positive, moralistic citizens. Several items were added to address detection approaches and content areas that seemed to be underrepresented in the initial sample of items, e.g., items regarding course of symptoms.

The item pool also contained a number of items which, in actuality, are not uncommon symptoms following head injury, such as sensitivity to light and concentration problems. These items may be useful in identifying individuals with true symptoms and tracking their progress over time, as well as identifying malingerers. Although, as noted, these items are not uncommon among those with true head injury, the heterogeneity of symptomatology makes it unlikely that any one individual will experience more than a minority of the overall symptom group. Therefore, malingerers might be detected by an overly broad endorsement of such items.

All items from the Community Survey (see below) were added to the initial item pool. The content of the Community Survey items was preserved, however, the format of these items needed to be changed to parallel the initial item pool questions. For example, the item, "Feeling numbness or tingling in hands," was rewritten as, "I feel numbness or tingling in my hands."

The item pool was carefully reviewed by each writer for clarity and redundancy. As the items were to be used initially with individuals who had not experienced a head injury, it was important to consider the use of the word "injury" in items and the time

frame used. It was decided that items referring to the injury should specify a time frame, such as: "My eyesight is the same as it was before my injury," and "Since my injury, my eyes have been very sensitive to light." Instructions given to the non-head-injured participants provided a time frame. Of the items that referred to an injury, 35 did not seem suitable for this change in format, an example being, "I have flashbacks of my head injury." These 35 items were all placed at the end of the questionnaire, and, as necessary, participants were provided with further instruction on how to answer them (see further below). The majority of the items did not refer to an injury, and were written in the present tense, for example, "My vision is often blurry."

Two writers (M. A. and D. S.) reviewed and discussed each item and decided which to change, delete, or keep. A large number of items from the Community Survey replaced nearly identical items in the initial pool due to redundancy. By retaining the Community Survey items, the data from the community sample could be compared with the university sample at a later point in time, if desired. Several items which were nearly identical were dropped or rewritten to maintain some degree of uniqueness. However, numerous items that were related or similar to other items were retained, for example, the items, "I have no trouble understanding what people say," and "I can usually follow conversations." This overlapping content created the potential to examine response patterns for consistency in order to identify such possible characteristics as carelessness in completing the inventory, as can be done with the MMPI and MMPI-2 (Greene, 1991). The third writer then reviewed the items, revising several items and recommending some slight revisions in wording. Also, some items were made more extreme in content, thereby potentially reducing the number of normal or genuinely head-injured individuals endorsing

the item. For example, rather than, "At times my eyes lose focus," which is not uncommon among normal individuals, the item was reworded as, "I can't focus my eyes at all," which is uncommon, certainly for the general population and even for individuals with mild head injury. The items were also reviewed for grammatical errors and clarity by two other individuals who did not write any items, and some minor changes were made. The result was a total of 472 items, which comprise the Traumatic Brain Injury Questionnaire (TBIQ).

The order of the TBIQ items was randomized and then reviewed to avoid similar items appearing adjacent to one another. When this occurred, items were moved to another position in the questionnaire. As noted above, 35 particular items referring to an injury were placed at the end of the measure. The order of these 35 items was also randomized.

Answer key. The three item writers developed an a priori answer key for the TBIQ. Two of the individuals reviewed the questionnaire independently and keyed the items in the direction they believed a malingerer would most likely answer. They agreed on 423 of the 472 items, or at a rate of about 90%. The 49 items on which they disagreed were reviewed by the third writer for additional input. The third writer felt confident in keying only 29 of the 49 items. These 29 additional items were then keyed in the direction of two-thirds agreement, resulting in 452 total keyed items. It was decided not to key the other 20 items because of their ambiguity. Many of these items involved unwillingness to admit to normal human shortcomings (e.g., involve social desirability). It was difficult to anticipate how they might be answered by the current research sample, and there is reason

to believe that for these particular items, a converse pattern of responding might be obtained with other samples.

Results

Reading level analyses. The TBIQ was checked for reading level. Given the intended population, the aim was to avoid reader requirements exceeding about an 8th grade level. Using a computer generated reading analysis program, the TBIQ had a Flesch-Kincaid Grade Level (Flesch, 1948; Kincaid, Fishburne, Rogers, & Chissom, 1975) of 5.5, meaning that someone with a 5th to 6th grade education would understand the questionnaire as a whole. This reading score is based on the average number of syllables per word and the average number of words per sentence. The Flesch-Kincaid Reading Ease (Flesch, 1948; Kincaid et al., 1975) for the TBIQ was 74.5. This score is also based on the average number of syllables per word and the average number of words per sentence on a 0-100 point scale, with higher scores indicating that more people could easily understand the document. Most standard writing has scores averaging in the 60-70 range on this scale. These analyses indicated, fortunately, that an average person with at least an 8th grade education should be able to easily understand the items.

Phase II. Community Survey

A survey of community members (lay individuals) regarding the symptoms of head injury was conducted. The original intent was to aid in item generation and refinement prior to the next phase of research. Community members might well have misconceptions regarding the symptoms of head injury. Items could then be generated based on these ~~misconceptions~~ misconceptions, with the assumption that individuals who have not directly experienced a

head injury, or who are exaggerating the effects of a head injury, i.e., malingerers, will endorse these symptoms, aiding in their identification.

Method

Participants and setting. The sample consisted of 40 community members, an adequate sample size given the exploratory purpose of this work. These participants were recruited from two community settings that were likely to yield a sample resembling the overall population of individuals who sustain mild head injuries. For example, mild head injuries occur disproportionately among those of below average socioeconomic status and educational levels. However, research samples in related “community” studies have often involved college students. Community members were recruited at the local Department of Motor Vehicles (DMV) and a local shopping mall after approval was obtained from the respective administrative offices. Potential shopping mall participants were offered a \$5.00 reimbursement for their time. Unfortunately, the DMV administration did not allow participants to be reimbursed.

It was made clear to all potential participants that participation was voluntary, with no penalty for choosing not to participate, and that the research was being conducted by a graduate student at the University of Rhode Island in order to meet degree requirements. Informed consent was obtained for all participants.

Participation was open to individuals between the ages of 18 and 65. Recruitment was limited to this age group for the following reasons: a) the participants were old enough to consent to participate without parental consent, and b) individuals over 65 are much less frequently involved in mild head injury litigation and, therefore, are not the population of greatest interest. Before obtaining consent, potential participants were

asked about their age if it was not obvious that they were between the ages of 18 and 65. Several individuals expressed interest in completing the survey, but did not meet the age requirements.

Participants ranged in age from 18 to 60 years old, with a mean of 32.7 years. Mean education level was 13.4 years, with a range of 10 to 19 years; approximately 53% of the sample had an education level of 12 years or below. Few participants were professionals, and only 22.5 % had college or Master's degrees. On the last day of data collection at the shopping mall, several women were denied participation in order to equalize the number of male and female participants.

Numerous individuals declined to participate based on various reasons including: the survey would take too long; they did not have the time; they were uninterested; and a few people at the Department of Motor Vehicles declined because they wanted to be paid for their time. Also, several individuals could not participate because they were unable to read English with sufficient understanding to fully comprehend the materials.

Not all participants recruited at the DMV were able to complete the survey before it was their turn to receive service. The large majority of these individuals subsequently returned to complete their surveys, but several of them did not because they could not offer any more of their time. Therefore, there were some missing data; one participant did not complete the second scale, and two participants did not complete the last page of the participant information sheet. Only one survey given at the local mall was not completed, as the participant failed to complete a page, perhaps inadvertently. One individual at the DMV took the survey, saying she would complete it while waiting for her turn, but never returned. Therefore, one additional participant was recruited at the mall and given the

same version of the survey that was not returned. Nineteen individuals fully participated at the DMV, and 21 at the mall, for a total of 40 participants.

Although no formal statistics were maintained, it seemed easier to recruit participants at the mall, perhaps due to the reimbursement offered. Also, the mall setting most likely contributed to individuals' willingness to participate in that they were not waiting to be serviced, as were individuals at the DMV. Therefore, it is possible that the participants recruited at the mall had different motivations to complete the survey than those recruited at the DMV.

Materials. All materials for this phase of the research can be found in Appendix A, including the informed consent form, the instructions used by the researchers, the Community Survey (including case scenarios and scales), and a participant information sheet.

The Community Survey was comprised of three short case scenarios, and two rating scales. One case described an average, healthy individual, one described an individual with a mild brain injury, and one described either an individual with depression or an individual with dementia. A main focus of the Community Survey was potential differences in responses to the average case and the mild brain injury case. Given concerns about possible order affects, the order of presentation for these two cases was alternated within the survey. The final case, which involved either depression or dementia, and which was examined largely for separate, exploratory purposes, was always placed last. This was done to minimize the possibility that rating this third case would influence or contaminate ratings of the other two cases. Half of the surveys had the depression

case, and the other half had the dementia case, resulting in four versions of the Community Survey.

The first rating scale of the Community Survey contained items which described common symptoms following head injury, very uncommon or improbable (but seemingly plausible) symptoms following head injury, and common symptoms of dementia and depression. The intent was to determine if individuals could accurately rate the likelihood of these symptoms following a mild head injury. This scale also included a short section containing several questions about symptom course for the mild brain injury case. The second rating scale was comprised of items referring to activities common to everyday living, with which most healthy individuals have no significant difficulty. For each item, participants were to rate how much trouble, if any, an average person, a person with a mild brain injury, and a person with either depression or dementia would have performing the referred to activity.

The participant information sheet contained questions regarding demographic information, a brief head injury screen, and questions regarding participants' fund of knowledge of head injury and depression or dementia.

Procedure. Data was collected by two of the aforementioned researchers (M. A. and D. S.), and a research assistant trained to administer the survey. The researcher identified herself/himself to potential participants and invited them to participate in a research study investigating people's knowledge of head injury. They were informed that the research was part of degree requirements for the Department of Psychology at the University of Rhode Island, and that the research involved a short survey, which would take about 20-30 minutes to complete.

Participants read an informed consent form, which they could keep for future reference. They were informed that names would not be associated in any way with their data, in order to maintain confidentiality and anonymity. Any questions about the study requirements or the use of the data were answered at that time. More specific questions regarding the nature of the study were addressed at the completion of the survey, in order to avoid possible biasing affects.

Participants were told that the study would involve reading three short cases and responding to two rating scales. Each participant was provided with one of the four versions of the Community Survey. These four versions were alternated before distribution, and each participant received the version on the top of the stack. An equal number of the four versions were administered. Participants were invited to ask any questions they had about the definitions of words in the case or study materials. No participant asked for clarification of any words or cases.

Participants were instructed to first read the three cases, and then to answer the rating scales. On the first scale, participants were asked to rate the likelihood of each symptom for an average person, a person with a mild brain injury, and an individual with either depression or dementia, depending upon which case they read. On the second scale, they were instructed to rate how much trouble, if any, an average person, a person with a mild brain injury, and a person with either depression or dementia would have performing the referred to activity. Several individuals did not fully understand the instructions. In these cases, the instructions were clarified until it was clear that understanding was achieved.

Following the completion of the Community Survey, participants were asked to provide demographic variables for descriptive purposes. It was made clear that providing this information was voluntary, but that the researchers would find it helpful. The participants were also screened for a history of head injury, and asked to provide information regarding their fund of knowledge of head injury and depression or dementia. Any questions the participant had about the study were then answered.

Results

The original purpose of the Community Survey was to generate ideas for potential items or item refinement based on lay misconceptions about head injury. This phase of the research was delayed due to uncontrollable factors, such as the decision of mall operators to delay the time of data collection. Given other practical constraints, it was decided to proceed with the Validation Study before the completion of the Community Survey. It was of course unknown which items in the survey might be most useful prior to collecting the needed data. However, at this stage of research, excluding potentially useful items from the TBIQ was considered more problematic than including less helpful ones. Therefore, all the items in the Community Survey were added to the item pool as described above. Given that the data collected through the Community Survey was not used to create the TBIQ, it was not analyzed as part of the current research project.

Phase III. Validation Study

Method

Participants. Data was collected from 330 university students during this phase of the research. These participants were recruited through undergraduate psychology courses. Two participants were not recruited through their courses. One was another

university student who came with a friend to a data collection session, and one was an individual visiting a friend who decided to participate. Students recruited through their psychology courses were given class credit for their participation. The amount of credit was determined by the professor for their course. Each participant was given a consent form as proof of their participation. It was made clear to all potential participants that participation was voluntary and there was no penalty for choosing not to participate. No data were collected from any individual without informed consent.

Given population base rates, it seemed highly likely in advance that some potential participants would have suffered a head injury. The main purpose of the Validation Study was to compare non-head-injured individuals responding honestly to those faking or exaggerating symptoms. Individuals with a history of head injury might answer the TBIQ differently than those with no such history, and thus were to be excluded from the study. Consequently, all potential participants were screened for head injuries, and only individuals with no prior head injuries, or insignificant, uncomplicated injuries (defined as a loss of consciousness or post-traumatic amnesia of only a few seconds) were included in the main study. Of the 330 participants included in the study, 271 individuals indicated no prior head injuries, and 59 indicated injuries with loss of consciousness or post-traumatic amnesia of only a few seconds.

All participants were over the age of 18. Recruitment was limited to this age group so that the participants could consent to participate without parental consent. No one was excluded from this research due to their gender, culture, or socioeconomic status.

Participants ranged in age from 18 to 39, with 70% being either 18 or 19 years of age. There were approximately three times as many females (77%) as males (23%). This

is consistent with the gender ratio among the students in the large psychology lecture classes, from which most of the participants were drawn. It would have been preferable to recruit as many, or more, males than females given the sociodemographics of mild head injury. However, such considerations were overridden by the need for a sufficient sample size to conduct the planned analyses and the impracticality (feasibility) of recruiting a sufficient number of males. About 60% of the participants were in their Freshman year, 27% in their Sophomore year, and about 13% were upperclassmen.

Materials. All materials for this phase of the research can be found in Appendix B, including the informed consent form, a head injury screen, the instructions given to the participants, the TBIQ (including a demographic information sheet), and the post-experimental questionnaire.

The consent forms and head injury screens were distributed together. After completing the screen, participants were given packets of information containing, in order, written instructions, the TBIQ items, and the demographic information sheet. Two versions of this packet were used, one for the honest responders and one for the malingering responders. These packets differed only in the instructions given to participants. As described in the Item Generation section, individuals instructed to answer the questionnaire honestly needed additional instructions for the last 35 items on the questionnaire. Therefore, the packet of information given to these individuals had initial instructions preceding the TBIQ items, and additional instructions inserted before the first of these last 35 items. The full instructions for the malingering respondents preceded the items.

The post-experimental questionnaires, which were used to evaluate how closely participants followed instructions, were distributed separately, after participants had completed the TBIQ. Researchers in malingering detection who have used post-experimental questionnaires have found that some people have difficulty faking, or cannot think of a strategy to use, and therefore do not follow instructions to mangle (e.g., Goebel, 1983). Those individuals who did not follow instructions were not included in the data analyses. Also, the post-experimental questionnaire asked the participants about the strategies they used to fake their responses.

Procedure. Data collection was conducted in groups. As participants arrived for the study, they were given a copy of the informed consent form and a head injury screen. They were instructed to read the consent form and, if they chose to participate, to then answer the head injury screen. Any questions they had about the materials were addressed. The consent form indicated that the research project was investigating head injury and would involve answering a questionnaire, under conditions of anonymity and confidentiality. The participants were not asked to provide their names on any of the study materials. The head injury screen required participants to provide their initials and the last four digits of their social security number. This identification code was transferred to all of the participant's research materials. This code was used to match screening information with the rest of the data, and also match original data to retest data if the participant decided to return for the retest session, as described below. Upon completion of all data analyses, this code was removed from the data to preserve confidentiality and anonymity.

After the head injury screen was completed, participants were assigned to either the "NORMAL" group, or the "MALINGERING" group. Participants were handed a packet of materials pre-coded with their group identifier and their identification code, which had been transferred from their head injury screen. The packet contained all necessary instructions, the TBIQ items, and the demographic information sheet. They were told that if they had any questions during the course of the study to please speak with the researcher. Only a few individuals asked for clarification of the materials. All questions were addressed to the extent possible during the study. Some questions could not be answered fully at the time of the study because it may have interfered with either the experimental manipulation, or the retest session if participants decided to return. All participants did have a phone number to contact the researcher at a later point in time, if they so chose.

Participants all completed the TBIQ, but under one of two different sets of instructions. The NORMAL group was instructed to answer the questionnaire honestly, describing how they have felt over the last 2 years. As described above, 35 items, which were placed at the end of the questionnaire, did not fit this format. For these items, additional instructions were provided. They were to assume they had sustained a head injury 2 years prior. However, they were further told to assume that the injury caused no problems and they were to answer the items accordingly.

The MALINGERING group was instructed to pretend that they were in a car accident 2 years ago, in which they suffered a "mild brain injury," but from which they had recovered. They were asked to pretend that they were suing the driver who hit them, and to assume that as part of their lawsuit, they were being sent to a health professional to

evaluate their case. They were instructed to answer the questionnaire as if were trying to convince the professional that they were still suffering from problems. They were informed that in cases such as these, financial compensation is greater when impairments are more severe. They were to make their responses look as impaired as possible, but not to the point that they would not be believed.

These two sets of instructions were alternated before distribution, and each participant received the packet on the top of the stack. An equal number of participants were assigned the MALINGERING and NORMAL instructions. There were 165 participants in each group.

A demographic sheet was attached to the questionnaire. Participants were instructed to complete this sheet after they had finished the questionnaire. Upon completion of the questionnaire and demographic sheet, these materials were returned to the researchers, and participants were asked to complete the post-experimental questionnaire.

After they completed the study, participants were given a sheet of information encouraging them to return for a retest session in 14 to 20 days. This sheet provided the days and times in which they could return. Several professors requested a record of their students who participated in the study in order to properly assign extra credit. At the completion of the study, students wrote their names and the names of their instructors on a separate sheet of paper. This list was copied for professors, but was never, in any way, associated with the data. Also, the researcher signed and dated the participant's consent form, to be provided to their instructor for proof of participation.

Retesting

Retesting was conducted to examine for response consistency as a potential additional, or adjunct, way to appraise exaggeration.

Participants. A total of 40 participants returned for a retest session 14-20 days from the date of the initial session, 20 from the NORMAL group and 20 from the MALINGERING group. Participants received additional course credit for their second participation. Participants who attended data collection sessions in the last 2 weeks of the semester were not asked to return, given time constraints. However, several participants who wished to arrange a retest session after formal data collection had ended were accommodated when possible. Those who could not be accommodated were given the names of several other researchers to contact if they wished. In this way, they were given an opportunity to still receive extra credit.

Participants ranged in age from 18 to 39, with 73% being either 19 or 20 years of age. About 20% of the participants were in their Freshman year, 53% in their Sophomore year, and about 27% were upperclassmen.

Materials. All the materials used for the retest were exactly the same as those used for the Validation Study.

Procedure. When participants returned for the retest session, they were asked to provide their identification number (initials and four digits of their social security number). The researcher checked to see if 14-20 days had passed since the time of their first participation and checked on their original group assignment. Several participants returned too soon, and were asked to return on another day.

Returning participants were given an informed consent form and asked to complete the head injury screen a second time. The participants were then given the packet of information with the same instructions they were given the first time. Upon completion of the TBIQ, they were again asked to complete the demographic information sheet and post-experimental questionnaire. They also once again signed in for their professors to receive extra course credit.

Results

This research was an initial step in validating the TBIQ, and hence the analyses were largely exploratory in nature. The purpose of the analyses was to evaluate the capacity of the items to discriminate between the groups, and, if feasible, other item characteristics, such as their interrelationships and factor structure.

Compliance. Compliance with the experimental instructions was determined by responses provided to the post-experimental questionnaire. In order to be considered compliant, the respondent needed to provide sufficient information to indicate that they had correctly comprehended and followed instructions.

One question on the post-experimental questionnaire requested participants to briefly summarize the instructions. The answer needed to be consistent with the actual instructions in order to be determined satisfactory (i.e., in compliance). For example, a MALINGERING responder who indicated that she never had a head injury, so therefore she answered questions as they truly applied to her, would be classified as noncompliant. Another question asked participants how closely they thought they followed the instructions on a 5-point scale, ranging from "Not Closely At All" to "Very Closely." Participants who indicated that they did not follow instructions closely (i.e., answered

“Not Closely At All”) were classified as noncompliant. Another question asked participants whether or not they faked their responses. Answers needed to be consistent with the instructions given to the participant (e.g., those in the MALINGERING group needed to indicate they had faked responses), or needed to be clarified to a sufficient extent on the following question. On this subsequent question, participants described their strategy for faking. Their response was not evaluated in terms of its suitability or cunning, but relative to their described approach to the questions, i.e., whether they indicated they were faking or not.

For many participants, responses to the post-experimental questionnaire provided clear and unambiguous indication of compliance or non-compliance. However, responses were sometimes vague or ambiguous, especially when taken together. For example, several NORMAL responders indicated that they had faked their responses. A number of these participants then clarified that they pretended to have had a head injury on the last part of the questionnaire, as they were instructed to do, and therefore they were actually compliant with the instructions. However, many of them did not clarify their answers enough to make this determination. Responses such as these called into question how compliant individuals were with instructions. Therefore the answers to all four of these questions were considered concurrently, and participants’ responses were rated as indicating definite compliance, definite noncompliance, or uncertain compliance.

Rates of compliance were significantly different across the NORMAL and MALINGERING groups, $\chi^2 (2, N = 330) = 27.36, p < .001$. Of the participants who were given the MALINGERING instructions, 84.2% were judged to be definitely compliant with the instructions, 6.1% as definitely noncompliant, and 9.7% as uncertain

compliance. However, only 58.2% of the participants who were given the NORMAL instructions were definitely compliant, 15.2% were rated as noncompliant, and 26.7% were rated as uncertain compliance. Only participants whose data were considered to be definitely compliant with instructions were included in analyses. Therefore, 96 NORMAL responders and 139 MALINGERING responders ($N = 235$) were included in the analyses.

Ironically, on a separate post-experimental questionnaire item in which participants indicated ease of following the instructions on a 5-point scale that ranged from "Not Easy/Difficult" to "Very Easy," almost 90% of all participants rated this item in the range of 3 to 5, indicating that the instructions were at least "Somewhat Easy" to follow. Also, as mentioned above, participants indicated how closely they followed the instructions on a 5-point scale that ranged from "Not Closely At All" to "Very Closely." Almost 96% of the participants rated this item in the range of 3 to 5, indicating that they had followed the instructions at least "Somewhat Closely." This suggests that although the wide majority of participants believed they understood and followed the instructions, a considerable number of these individuals answered other, more open-ended questions in a way that suggested otherwise.

Discrimination of groups. The purpose of this set of analyses was to evaluate the capacity of the TBIQ to discriminate between the NORMAL and MALINGERING respondents. First, however, the NORMAL and MALINGERING groups were compared on a variety of demographic variables. There were no significant differences across the two groups in age, $F(1, 232) = 1.51, p = .220$; year in college, $F(1, 233) = .066, p = .798$; or gender, $\chi^2(1, N = 235) = .375, p = .540$. Also, there were no differences in the

reported frequency of attention deficit disorders or learning disabilities, $\chi^2 (1, N = 234) = 3.63, p = .057$; medical problems, $\chi^2 (1, N = 234) = 1.072, p = .300$; psychological illness, $\chi^2 (1, N = 234) = .024, p = .878$; or having experienced a brief loss of consciousness, $\chi^2 (1, N = 235) = .734, p = .392$.

As an initial step in examining the properties of the TBIQ, a total score was calculated using the a priori answer key discussed above. Total scores were computed for all compliant participants ($N = 235$) by summing the number of 452 keyed items answered in the keyed direction. Such a total score does not maximize the potential discriminatory power of the questions, because all items, whether they turn out to be effective or not, are included. In any case, this seemed like a reasonable starting point and did not run the risk of capitalizing on statistical artifact or chance association (that are likely to appear given the number of items and sample size involved).

Total scores were prorated for missing items using a percent total score, which was created by dividing participants' total scores (the number of items answered in the keyed direction) by the number of keyed items that were answered (i.e., 452 minus the number of missing items). For example, if a participant did not answer 2 of the 452 keyed items, their percent total score was computed by dividing their total score by 450.

Answers to items were considered missing if they were left blank, or if the participant answered both true and false to the same item. The number of missing items ranged from 0 to 30. Of the compliant participants, 182 answered all the items, 48 did not answer one to six items, and five did not answer 20 to 30 items. The five participants with a considerable number of missing items were not included in the analyses. It was reasoned that if a clinician was administering the TBIQ, as is ultimately intended, the missing data

would have been noticed, and the examinee instructed to complete the instrument to the extent possible. In this research, it appeared that the individuals with a large number of missing items had inadvertently missed a page of items when completing the questionnaire.

Percent total scores on the TBIQ were calculated for 94 NORMAL responders and 136 MALINGERING responders. Percent total scores for NORMAL responders ranged from 6.64% to 36.06%, and for MALINGERING responders from 18.36% to 83.41%. The mean percent total score of the MALINGERING responders ($\underline{M} = 53.01\%$, $\underline{SD} = 16.26\%$) was significantly higher than that for the NORMAL responders ($\underline{M} = 15.75\%$, $\underline{SD} = 5.39\%$), $F(1, 229) = 458.53$, $p < .001$, $\eta^2 = .668$.

The distributions of NORMAL and MALINGERING responders scores were plotted against each other to determine cutting scores. A total of 44 cases (or about 19% of the sample) overlapped at the tail ends of the distributions. The optimal cutting score correctly classified 95.22% of respondents. Table 1 contains possible cutting scores with their respective sensitivity and specificity rates, positive predictive power, and negative predictive power. It would seem obvious that the results, which as noted, do not capitalize on chance relations and include items regardless of their discriminatory power based on a priori keying, suggest that the TBIQ has promise in differentiating groups.

Cross-validation analyses. The next set of analyses was intended to identify TBIQ items with the greatest discriminatory power, and to evaluate their consistency across samples. Participants whose protocols were rated as definitely compliant were randomly assigned to either a derivation or a validation group. Half of the NORMAL responders and half of the MALINGERING responders were assigned to the derivation group ($\underline{n} = 117$), and the other halves assigned to the validation group ($\underline{n} = 118$). When these groups

were compared on a variety of demographic variables, no significant differences emerged in age, $F(1, 232) = 1.11, p = .293$; year in college, $F(1, 233) = 2.78, p = .097$; or gender, $\chi^2(1, N = 235) = .075, p = .784$. There were also no differences in the reported frequency of attention deficit disorders or learning disabilities, $\chi^2(1, N = 234) = 2.128, p = .145$; medical problems, $\chi^2(1, N = 234) = .618, p = .432$; psychological illness, $\chi^2(1, N = 234) = .279, p = .597$; or having experienced a brief loss of consciousness, $\chi^2(1, N = 235) = .024, p = .876$.

The discriminatory power of items was examined by first comparing the NORMAL and MALINGERING respondents in the derivation group. Chi-squares were calculated for each individual item. A p value of .01 was chosen as the level of significance. This level seemed sufficiently stringent to avoid too many chance associations, but not so stringent as to eliminate too many potentially useful items. In fact, 377 items of the 472 items produced significant differences (χ^2 ranging from 6.59 to 82.76); 318 of which were significant at $p < .001$. It was originally proposed that factor analyses would be used to explore the structure of the TBIQ, and that subscales would be created based on the solution, however, given the large number of significant items, such analyses were technically improper and unnecessary.

The 35 items placed at the end of the TBIQ, which required additional, potentially confusing, instructions for the NORMAL group, were evaluated to determine their effectiveness. The frequency with which these items reached the .01 level of significance was compared to the frequency for the remainder of the items. Of the 35 items, 80% had endorsement frequencies that significantly differed by group, matching almost exactly the 79.86% frequency for the remaining 437 items. Overall, the distribution of these 35 items

throughout the range of chi-square values appeared to be the same as that for the other 437 items.

Next, selecting the 377 total items in which endorsement significantly differed by group, a post hoc answer key was created. These answers were keyed in the “deviant” (i.e., malingering) direction. The post hoc key was very similar to the a priori key. Of the 377 post hoc items, approximately 97% were keyed in the same direction on the a priori key, 1% were keyed in the opposite direction, and 2% were not keyed on the a priori key due to their ambiguity.

Total scores were computed using the post hoc key for the participants assigned to the derivation group by summing the number of items answered in the keyed direction. Only those individuals who were missing six or less items were included ($N=114$). Total scores were prorated for missing values by computing a percent total using the same method previously described.

Percent total scores for NORMAL responders ($n = 47$) ranged from 1.59% to 34.75%, and for MALINGERING responders ($n = 67$) from 16.18% to 88.33%. The mean percent total score was significantly and substantially higher for the MALINGERING responders ($M = 53.62\%$, $SD = 19.24\%$) in comparison to the NORMAL responders ($M = 11.88\%$, $SD = 6.86\%$), $F(1, 113) = 202.68$, $p < .001$, $\eta^2 = .644$. The distributions of NORMAL and MALINGERING responders percent total scores were plotted against each other to determine cutting scores. A total of 24 cases, 21% of the sample, overlapped at the tail ends of the distributions. The optimal cutting score correctly classified 95.61% of respondents.

This cutting score was then applied to the validation group to examine the stability of the results. Percent total scores were computed, as described above, for the NORMAL ($n = 47$) and MALINGERING ($n = 69$) participants in the validation group. Again, only those individuals who were missing six or less items were included ($N = 116$). The optimal cutting score from the derivation group correctly classified 96.55% of respondents in the validation group, that is, there was no decrease in discriminatory power. Percent total scores ranged from 2.93% to 27.32% for the NORMAL responders and from 22.02% to 88.59% for the MALINGERING responders. There were only 6 cases, 5.17% of the validation sample, which overlapped at the tail ends of the distributions. Again, the mean percent total score of the MALINGERING responders ($M = 57.50\%$, $SD = 16.65\%$) was significantly and substantially higher than that of the NORMAL responders ($M = 12.57\%$, $SD = 5.25\%$), $F(1, 115) = 319.85$, $p < .001$, $\eta^2 = .737$. The sensitivity rates, specificity rates, positive predictive power, and negative predictive power for cutoff scores in both the derivation and validation groups are presented in Table 2. In summary, analysis of the derivation and validation groups suggested stability in the discriminatory power of items, at least when analyzed in combination as total scores.

Retest analyses. Retest analyses were conducted to examine within-subject response consistency over a relatively short period of time. Individuals who returned for the retest were significantly older ($M = 20.68$, $SD = 3.92$) than those who did not ($M = 19.16$, $SD = 1.60$), $F(1, 327) = 19.75$, $p < .001$, $\eta^2 = .057$. The mean year in college for the retest participants ($M = 2.10$, $SD = .74$) was significantly higher than those who did not return ($M = 1.48$, $SD = .79$), $F(1, 328) = 21.58$, $p < .001$, $\eta^2 = .062$. These

dissimilarities are most likely due to differences in recruitment from particular courses and the amount of extra credit offered by individual professors.

Participants' retest data was matched to their data from their first participation using their identification codes. Although there were 20 NORMAL responders and 20 MALINGERING responders in the retest sample, only 10 NORMAL responders (50%) and 18 MALINGERING responders (90%) had protocols that were determined to be definitely compliant with the experimental instructions. The distribution of compliant participants in the retest sample was relatively consistent with that obtained in the initial test sample. Of the 28 valid retest cases, 23 of the retest respondents were determined to have been compliant with instructions at Time 1. Participants were included only if their participation was determined to be compliant at both Time 1 and Time 2. Consequently, there were 23 pairs of data, comprised of 7 NORMAL responders and 16 MALINGERING responders.

It was expected that the MALINGERING individuals would show greater response variability over time because of the limits of their memory. Given the length of the scale, people who were faking might well have difficulty remembering their previous answers and, therefore, produce less consistent responses than individuals who answered honestly.

Given the small sample sizes and the inequality of the groups, test-retest correlations were not used to evaluate the stability of the scale over time, as initially proposed. Rather, a consistency score was calculated, based on the total number of items answered identically on both test occasions. There were no missing items for any compliant respondents on the retest questionnaire, however, four individuals were missing

one or two answers on their initial questionnaire. Consistency scores were prorated for missing items by dividing the total number of consistent scores by the total number of item pairs answered at both Time 1 and Time 2, creating a percent consistency score. As expected, the mean percent consistency score of the MALINGERERS ($M = 74.6\%$, $SD = 9.8\%$) was significantly lower than the mean of the NORMAL responders ($M = 90\%$, $SD = 4\%$), $F(1, 22) = 15.77$, $p = .001$, $\eta^2 = .429$.

Cutoff scores were determined for the percent consistency scores, two of which correctly classified about 96% of the participants. Using a cutoff score of less than or equal to 84%, only one MALINGERING individual was misclassified as NORMAL, with a specificity rate of 100%. Identifying all MALINGERERS (100% sensitivity) at the risk of misclassifying NORMALS, a cutoff score of less than or equal to 85% was most effective, misclassifying only one NORMAL responder, again with an accuracy rate of about 96%.

Consistency scores were originally constructed in the hopes of increasing the accuracy achieved by item totals or other such indicators alone. The high rate of classification achieved with item totals in the present sample, along with the small sample size of the test-retest sample, made it difficult to fully explore this possibility. These limitations notwithstanding, exploratory analyses were conducted. There was some indication that individuals incorrectly classified using their total scores could be correctly classified using consistency scores. For example, a MALINGERING respondent who was misclassified as a NORMAL respondent by examining his/her total score (using a cutoff with approximately 98% specificity), was accurately classified as a MALINGERER using

consistency scores. Additionally, no individuals who were correctly classified by their total score were misclassified by their consistency score.

Discussion

The goal of the current research was to begin the development and validation of a structured interview aimed at distinguishing between individuals with true head injury symptoms and those faking or exaggerating symptoms. More accurate identification of veracity can help not only to identify individuals who are malingering the effects of a mild head injury, but also to establish the merit of genuine cases. Current measures for malingering detection are not specifically targeted to mild head injury, or only measure cognitive performance. It is unlikely that all individuals who attempt to malingering will limit their deception to cognitive measures, or even target these measures. As noted, not all malingerers are likely to deceive in the same way, and it is probable that properly combining (e.g., via actuarial judgment) multiple sound measures will increase the sensitivity and specificity of detection. At this time, there is no method that specifically capitalizes on knowledge about the symptoms and course of mild head injury.

Malingering of mild head injury poses some special challenges because the symptoms of genuine injury may be very similar to those of other common disorders, such as depression and alcohol abuse. Also, there is usually no objective way to validate a mild head injury claim, and there remain uncertainties about such matters as resultant patterns of deficit and the minimal injury required to produce symptoms. For these reasons, it seems likely that an interview format specifically aimed at identifying malingering of mild head injury could prove helpful.

In the initial development stage of the Traumatic Brain Injury Questionnaire (TBIQ), three writers generated items that covered a wide range of probable and improbable cognitive, emotional, and somatic symptoms that could arise following a head injury. Many items were designed to seem plausible to laypersons, when in actuality they contradicted expectations about head injury based on scientific literature. Various items also addressed potential behavioral changes, course of recovery, and socially desirable characteristics. Malingers may be detected through overendorsement of symptoms that can, but by no means always, occur with mild head injury, and/or by overly denying normal personal shortcomings. Items were eliminated from the initial pool if they were overly redundant, or if it seemed that the content would not be easily understood. Some item redundancy or overlap was considered desirable because inconsistency in responding to like items could help in detecting malingers. A cautious approach to item elimination was taken because, at this point, it seemed worse to lose potentially useful items than to include ineffective items that could be identified and excluded later. These steps resulted in 472 items. A reading level analysis indicated that this measure could be easily understood by an individual with an 8th grade education.

The capacity of the TBIQ to discriminate between individuals answering honestly and individuals asked to mangle the effects of a mild brain injury was evaluated using a college student population in a classic malingering simulation study. Only those participants who were judged to be compliant with the experimental instructions were included in the analyses. Utilizing compliant participants' total scores on an a priori key developed by the item writers, the results suggest that the scale has considerable promise. Total scores were much higher for the malingering group than the honest group. Only

about 19% of the sample overlapped at the tail ends of the distributions, and the optimal cutting score correctly classified about 95% of respondents. For this cutting score, sensitivity was about 99%, specificity was 90%, positive predictive power was 94%, and negative predictive power was about 98%. This is a very high level of accuracy, especially considering that the a priori key did not maximize the potential discriminatory power of the items. The key was constructed in advance of data indicating the effectiveness of items, and 452 keyed items, whether effective at discriminating the groups or not, were included in these total scores.

Although the level of discrimination achieved with the a priori key rendered certain further analyses of limited practicality or importance, select examination was conducted of other scale characteristics. It seemed worthwhile to examine, for example, whether an analysis to identify the most effective items would demonstrate consistency or stability. Therefore, the sample was split into derivation and validation groups. Chi-square analyses were conducted with the derivation sample to identify effective items. Using a .01 level of significance, 377 items distinguished between the malingering and honest responders and were included in the post hoc answer key. In the derivation sample, the total scores on the post hoc key correctly classified about 96% of the respondents. The cutting score from the derivation group was then applied to the total scores of the validation group. The optimal cutting score for the derivation group correctly classified about 97 % of the validation group. There was obviously no decrease in discriminatory power across the groups. Remarkably, only about 5% of the validation group overlapped at the tail ends of the distribution. These results indicate that the discriminatory power shown by the

combined TBIQ items may well have good cross-situational consistency, at least across certain samples.

An analysis of within-subject response consistency over a relatively short period of time, which involved a fairly small sample, also yielded promising results. Consistency scores were calculated by summing the number of items that were answered the same way across test administrations. As expected, the honest responders had significantly higher consistency scores than the malingering group. Although caution is called for given the small sample size, the results suggest greater consistency among individuals answering honestly versus those exaggerating or faking disorder. This result aligns with other research on the use of consistency measures to detect malingering (e.g., Reitan & Wolfson, 1997). Individuals who feign responses to multiple novel questions and, therefore, more or less have to make up answers as they go along, may have considerable difficulty later on duplicating their answers. In contrast, individuals who answer honestly do not have to recall their initial answers. As this or other consistency measures that can be derived from the TBIQ may have discriminatory power and also may be non-redundant with other dimensions of measurement, they may add to the accuracy achieved through adding up the number of deviant responses on the full scale or sections of the scale.

Overall, it appears that the TBIQ shows promise in discriminating honest responders from those feigning mild brain injuries. Across varying analyses, the average total score of the malingering responders was far higher than the honest responders, and cutoff scores correctly classified almost all participants, with high sensitivity and specificity. The optimal cutoff score using the post hoc total scores showed good consistency on cross-validation, that is, classification accuracy did not decrease across the

groups. Also, analysis of test-retest response consistency yielded promising results and the possibility of an additional, non-redundant discriminator that could produce incremental validity. There is good reason to believe that the TBIQ will retain some, if not a substantial amount, of its discriminatory power when applied to malingerers and head-injured individuals responding honestly. In particular, it seems clear that malingerers in this study "bought" various implausible items, that is, they viewed many of the implausible items as likely consequences of mild head injury. This interpretation seems justified when one considers that the questionnaire contained a very large number of implausible items, that the malingering subjects, on average, endorsed many (over 200) of the questionnaire items, and that chi-square analyses showed that the great majority of items discriminated between groups. It also seems likely that the endorsement rate of plausible items was well beyond that expected with mildly head-injured groups, although additional research will be needed to clarify this issue.

Criticisms of the Dissertation

Unmet objectives. Several objectives of this study were not met. Originally, it was proposed that information collected from the community sample would be used to aid in item generation. Due to time constraints and difficulties obtaining recruitment sites, the results of the Community Survey were not integrated into the TBIQ. This unmet objective seemingly created no major problems because all items from the Community Survey were added to the scale, thereby ensuring that all potentially useful items were retained. However, it is likely that items which did not have good discriminatory power were also added to the scale, making it unnecessarily longer, and in the long run, potentially decreasing accuracy.

Original plans also called for factor analyses to help determine the structure of the TBIQ and to create potential subscales. However, so many items proved effective that factor analysis was not feasible. The level of discriminatory power demonstrated by a large majority of items is a crude indication of a one factor solution, at least with the current sample. However, the same will probably not hold with other samples. Potentially, subscales could be used to identify malingering approaches, such as endorsing an unusual number of extreme items, denying positive attributes, or endorsing only certain types of symptoms, such as only physical symptoms. It is possible that subscales may prove useful in not only differentiating between malingerers and honest responders, but potentially between head-injured individuals and other client populations that have similar symptoms. Subscales may also be useful in identifying individuals who are misrepresenting symptoms for other reasons, for example people with Somatoform Disorders. However, all of this remains to be determined through future research involving such subgroups.

Most significantly, this study would have been much stronger if there had been a large enough sample of head-injured individuals to complete the supplemental Head Injury Study. Ultimately, the clinician is interested in distinguishing between individuals who have had a head injury and are answering honestly, and those individuals who are faking or exaggerating the consequences of a mild head injury (e.g., an injury from which they have truly recovered). These are likely much more difficult distinctions to make, and until more research is conducted using true head-injured samples, the ability of the TBIQ to make this distinction is uncertain.

Methodological shortcomings. This study had several limitations which may have impacted the results. One was the lack of compliance, or possible lack of compliance, among a large number of participants. In a considerable percentage of cases, participants were classified as non-compliant with instructions or as exhibiting uncertain compliance. This raises the question of participants' motivation and investment in the study as a whole. It is unclear why so many individuals may not have been compliant with instructions. This may have resulted from not reading and/or following the instructions. Alternatively, many participants may not have fully understood the items on the post-experimental questionnaire. It should be noted that very few individuals asked for clarification of any instruction or item in the study. Although the large majority of individuals indicated that they found the instructions at least somewhat easy to follow, perhaps various participants did not fully understand what they were being asked to do. Ratings of the ease of following the instructions, in combination with compliance ratings, suggests that participants either under-recognized difficulties following instructions, or when responding to the post-experimental questionnaire, under-represented their understanding of the experimental instructions. Also, given that participants' open-ended answers to the post-experimental questionnaire were often vague, in many cases, it was difficult to determine whether they had been compliant.

The inequality of compliance with instructions across the NORMAL and MALINGERING groups may be due to unevenness in the difficulty of the instructions, or confusion on the part of the honest responders when answering the post-experimental questionnaire. Specifically, the additional instructions provided to the honest responders for the last 35 items directed them to pretend they had experienced a head injury with no

subsequent problems. And, on the post-experimental questionnaire, many of the honest responders indicated that they faked the consequences of a head injury. Some of the honest responders then specified that they feigned only the last part of the questionnaire, and were therefore considered to have been compliant with instructions. However, many responses to the post-experimental questionnaire were too vague to make this determination.

This difference in rates of compliance across the groups could have impacted the equality of the groups. For example, perhaps only more intelligent or motivated individuals were able to fully understand the instructions for honest responding, or fully express their understanding of the honest instructions on the post-experimental questionnaire.

It should also be noted that the study sample was comprised of college students required to participate in research for course credit. In order to obtain credit, students needed only to participate in a research study, and there was obviously no stipulation that they needed to fully comply with the research in order to receive credit. Therefore it is likely that some individuals were not motivated to do their best as research participants, but rather to complete the study and obtain course credit. Also, given the length of the questionnaire, perhaps some participants' motivation and interest dwindled over time, and when given the post-experimental questionnaire, they wished to be done with the study and answered the items hastily. If their answers were too vague, their compliance was then called into question.

The post-experimental questionnaire included two open-ended questions relating to compliance. Some level of subjective judgment was involved in evaluating responses to

these questions, and only one of the researchers reviewed these materials and classified compliance levels. It is possible that the ratings lacked reliability although, in many cases, these determinations were straightforward. This study could have been strengthened by using more than one rater to determine compliance, or using more detailed, closed-ended questions to clarify participants' level of compliance. For example, multiple-choice alternatives could be provided that covered task instructions.

Another limitation of this study is that although compliance with the instructions was rated, the actual performance of the participants, most importantly the malingering participants, could not be determined. Individuals who chose to intentionally misrepresent symptoms may or may not have been very effective at doing so, although the near uniformity with which exaggerators were detected does somewhat mitigate this concern. It is possible that the malingering participants who scored very high on the scale were not effective malingerers and would be easily detected on most any malingering measure. The great majority of participants did not describe their faking strategies in enough detail to assess how well their strategy might work. It is not clear if malingering responders who scored lower on the TBIQ were good malingerers in that their scores may have been misclassified as those of honest responders, or, if they may not have endorsed a sufficient number of items to look as if they were suffering from symptoms due to their injury. This latter question may be answered with further research examining how genuinely head-injured and symptomatic individuals would answer the questionnaire. Also, the student malingerers in this study may well be dissimilar to those who malingering head injury in real world settings. Unlike student malingerers, true malingering individuals often have powerful incentives to appear impaired and not be detected. Such individuals, for

example, may go to considerable lengths to prepare for their role and also may receive cues about symptoms through such experiences as interviews related to their claims.

One might argue that another limitation of this study was that the retest sample was somewhat older and further along in college than the rest of the sample. This was most likely due to participant recruitment and the fact that one professor offered significant extra credit to his students for their participation in this particular study. This course happened to be a higher level course than the course from which the majority of participants were recruited. Although the sample differed somewhat, it seems unlikely that minor differences in age and education would affect consistency scores. Rates of compliance and classification rates did not seem to differ between the retest sample and the rest of the sample, and the total scores of the retest sample appeared to be evenly distributed with those of the other participants.

The procedure used to classify head injury was another potential limitation of this study. The definition of a head injury for this study was a loss of consciousness or post-traumatic amnesia of more than a few seconds. Individuals who indicated loss of consciousness or post-traumatic amnesia of just a few seconds were considered to have suffered non-significant injuries and were recruited for the Validation Study. In this way, individuals who had experienced very minor or trivial head injuries with no meaningful or long-term consequences could be included, thereby increasing sample size. However, there was no way to verify head injury status, or if these injuries were truly minor. Also, head injury status was based on self-report, which certainly may contain some degree of error. In fact, a few individuals who returned for the retest session were not fully consistent in their responses to the head injury screen across participation sessions.

Future research will focus primarily on the TBIQ's ability to distinguish individuals with true head injury sequelae from other populations. At this time, it is unclear how head-injured individuals will answer this questionnaire. It will be of interest to determine how severity and length of time since injury impact the total scores on the questionnaire. It is assumed that individuals with these injuries will improve over time, which in turn will affect the consistency of their scores over time. Whether inconsistency resulting from genuine improvement in symptoms can be distinguished from inconsistent responding among malingerers, perhaps by analysis of item patterns, remains to be determined. It will also be very important to examine the potential impact of coaching on questionnaire responses and effectiveness. How easily can a knowledgeable person beat the measure? What types of information do they need, and how much information do they need? Also, knowing what types of strategies are effective at beating the measure will help in developing counter-strategies for identifying malingerers.

Future research will likely include attempts to develop subscales aimed at identifying potential approaches taken by malingerers to appear impaired and possible detection techniques. For example, subscales may be developed which identify endorsement of implausible symptoms, overendorsement of plausible symptoms, or denial of normal human shortcomings. Subscales may also focus on ways to detect malingering such as identifying inconsistent responding. As mentioned, subscales may also prove helpful in distinguishing between mild head injury and other disorders with similar symptoms, as well as factors underlying misrepresentation of symptoms, such as self-deception versus true malingering.

Studying true malingerers is a challenge. Malingerers do not readily identify themselves to researchers, and the base rate for malingering is not clearly known. Base rates play a large role in determining the usefulness of a measure due to the impact on sensitivity, specificity, and positive and negative predictive power. Therefore, populations that are expected to have differing rates of potential malingerers, such as those in litigation, will be investigated.

It would also be useful to examine how individuals with genuine, symptomatic injuries may exaggerate their symptoms on the TBIQ. It is likely that individuals with first-hand knowledge of symptoms would be better at identifying plausible versus implausible items than those who have sustained trivial, non-symptomatic injuries. Such known populations may enhance information about how exaggerating is manifested on the questionnaire.

Another potentially important line of research with the TBIQ involves other disorders that are similar in symptom presentation to mild head injuries, such as neurologic disorders with diffuse effects. Examples include, but are not limited to, exposure to toxins, and mild to moderate anoxia. Also, several medical and psychological disorders can produce symptomatology similar to head injury, such as sleep disorders and depression. It would be useful to be able to distinguish between these groups using the TBIQ because some malingerers falsely attribute genuine symptoms, which are due to other causes, to head injury. For example, an individual may complain of attention problems, headaches, and fatigue following head injury, but they may well know that these symptoms have been present for years following repeated exposure to solvents. The TBIQ also may help to detect people faking other neurological disorders that parallel head

injury, e.g., toxin exposure. Also, intentional versus unintentional misrepresentation of symptoms should be evaluated. For example, Somatoform Disorders, which theoretically, involve unintentional (self-) deception rather than intentional misrepresentation, may present in a manner similar to malingering. At this point in development, it is unclear how (or if) the TBIQ may distinguish between various factors that could underlie misrepresentation or exaggeration of symptoms. It is believed that creation of subscales may facilitate these distinctions.

Research to this point indicates that the TBIQ is effective in distinguishing between individuals without head injury who are answering honestly, and those who are trying to appear as if they have had a mild brain injury. Accurate classification rates were close to 95% with this measure, and it also exhibited good specificity, sensitivity, positive predictive power, and negative predictive power. The high rate of endorsement by malingering individuals indicates that they most likely endorsed a number of improbable items, thereby exceeding the rate of endorsement expected from a genuinely head-injured population. These results, in turn, suggest that the TBIQ has considerable promise for distinguishing between groups of more direct clinical relevance. With further development, this scale may be a useful tool in identifying malingered mild head injury, as well as validating genuine sequelae resulting from mild head injury, especially when combined properly with other measures of demonstrated effectiveness.

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Table 1

_____ for Classifying MALINGERING and NORMAL Participants on the TBIQ

(N = 230)

Cutting Score on the TBIQ	% Correctly Classified	Sensitivity	Specificity	PPP ^a	NPP ^b
18.81%	91.74%	100%	79.79%	87.74%	100%
21.02%	95.22%	99.26%	89.36%	93.10%	98.82%
21.46%	95.22%	98.53%	90.43%	93.71%	97.70%
25.22%	94.78%	94.85%	94.68%	96.27%	92.71%
29.56%	93.48%	90.44%	97.87%	98.40%	87.62%
36.73%	89.13%	81.62%	100%	100%	78.99%

Note. These values were determined using the a priori answer key.

^a Positive Predictive Power. ^b Negative Predictive Power.

Table 2

Scores for Classifying MALINGERING and NORMAL Participants in the

Derivation and Validation Groups on the TBIQ

Cutting Score on the TBIQ	% Correctly Classified	Sensitivity	Specificity	PPP ^a	NPP ^b
Derivation Group (n = 114)					
16.18%	91.23%	100%	78.72%	87.00%	100%
21.22% ^c	95.61%	98.51%	91.49%	94.29%	97.73%
22.28%	94.74%	95.52%	93.62%	95.52%	93.62%
23.40%	92.98%	91.04%	95.74%	96.83%	88.24%
35.81%	87.72%	79.10%	100%	100%	77.05%
Validation Group (n = 116)					
21.22% ^d	96.55%	100%	91.49%	94.52%	100%
22.02%	97.41%	100%	93.62%	95.83%	100%
26.26%	97.41%	98.55%	95.74%	97.14%	97.83%
27.32%	97.41%	97.10%	97.87%	98.53%	95.83%
30.13%	98.28%	97.10%	100%	100%	95.92%

Note. These values were determined using the post hoc answer key.

^a Positive Predictive Power. ^b Negative Predictive Power. ^c Optimal cutting score for the derivation group. ^d Optimal cutting score for the derivation group applied to the validation group.

Appendix A

Materials for the Community Survey¹

¹ Note. Additional titles have been added to some of the materials to aid in clarity. The overall content of the materials has not changed from that presented to the participants.

The University of Rhode Island
Department of Psychology
Kingston, RI 02881

Mild Head Injury Scale Development - Community Survey

CONSENT FORM FOR RESEARCH

You have been asked to take part in the research described below, which is being done by researchers at the University of Rhode Island. The project will be explained to you, and you can ask any questions about participation in the study. If you have more questions later, you can call Margaret Ackley, M.S., or David Faust, Ph.D. (874-2193), the people mainly responsible for the study.

YOU MUST BE AT LEAST 18 YEARS OLD TO BE IN THIS RESEARCH PROJECT.

Description of the project:

This study is looking at people's knowledge and beliefs about head injury.

What will be done:

If you take part in this study, you will complete a questionnaire that will last about 20 minutes. This questionnaire consists of questions about the possible effects of head injury. The questionnaire will also contain questions about other medical or psychological problems. After you complete the questions, the researcher will briefly ask you about any head injuries you may have experienced. The researcher will also briefly ask you how you may have learned about head injury and other medical or psychological problems.

Risks or discomfort:

The possible risks or discomforts of the study are minimal, although you may find some of the questions difficult to answer.

Benefits of the study:

You will not benefit directly for taking part in this study. However, the researchers may learn more about people's knowledge of head injury. This information will be used to develop ways to identify people with head injuries and identify people who may be faking an injury.

Confidentiality:

Your part in this study is confidential. None of the information on the questionnaire will identify you by name. No one else can know if you participated in this study, and no one else can find out what your answers are. Reports will be based on group information and will not identify you or any individual in this project.

Decision to quit at any time:

The decision to take part in this study is up to you. You do not have to participate, and you can refuse to answer any question. If you decide to take part in the study, you may quit at any time. Whatever you decide will in no way penalize you. If you wish to quit, you can simply inform the researcher doing the questionnaire, or you can call Margaret Ackley (874-2193) at any time during this research.

Rights and Complaints:

If you are not happy with the way this study is done, you may discuss your complaints with Margaret Ackley, M.S., or David Faust, Ph.D. (874-2193). You may also contact the office of the Vice Provost for Research, 70 Lower College Rd., Suite 2, University of Rhode Island, Kingston, RI, telephone: (401) 874-2635.

You are at least 18 years old. You have read the consent form and your questions have been answered to your satisfaction. Your filling out this questionnaire implies your consent to participate in this study.

COMMUNITY SURVEY - INSTRUCTIONS

After a brief introduction to the researcher and the study...

- I. (IF NOT OBVIOUS) **Are you between the ages of 18 and 65?**
if **NO**, thank for their interest and do not include
if **YES**, proceed with informed consent form

II. Present **INFORMED CONSENT FORM** - EXPLAIN AND SIGN

III. Brief Introduction to the task:

"As mentioned already in the consent form, I am studying what people know about head injury and other medical and psychological problems. I will ask you to read 3 short descriptions of people and then have you answer some questions, based on the information given to you. Do you have any questions before we begin?"

IV. Present 3 cases and rating scales:

"Here are the 3 cases and the rating scales. Please read each case carefully. If you are not sure of any words, I'll be happy to help you. When you are done reading the cases, there are 2 rating scales I would like you to complete. Please read all 3 cases before answering the questions, you can refer back to the cases if you need to."

"For each scale, the instructions are at the top of the page along with the scale (point). I want you to rate each item according to the scale at the top of each page for each of the 3 cases (point to the items, scale, and response fields). (while pointing, elaborate...) So, for each of these items (point) you will use this scale (point) and circle your answer for each of these 3 cases (point to each response field for the first item and NAME THE CASES). You will notice that this page is a bit different, (briefly point out course page) again, the instructions are at the top of the page and you are to circle your answers. After you finish these items (point to the page with the course questions and show them the next scale) there is a new scale for you to use to rate the cases for the next items. Do you have any questions? If you need any help as you go along, please ask me."

COMMUNITY SURVEY - CASES

Case 1 - Average

Sam is a relatively young man. He has no serious physical or mental problems, and generally is handling the day-to-day requirements of life without too much trouble. He recently saw his doctor for a routine check-up. Based on the exam, his doctor told him he was in good physical and mental health.

Case 2 - Mild Brain Injury

Jim is a relatively young man. In the past, he has had no serious physical or mental problems, and generally handled the day-to-day requirements of life without too much trouble. More recently, however, he has started to experience more problems in his day-to-day functioning, and decided to see his doctor. He had been in a car accident, hit his head on the windshield, and was knocked out for a few minutes. Based on the exam, his doctor diagnosed him with a mild brain injury.

Case 3 - Depression

Tom is a relatively young man. In the past, he has had no serious physical or mental problems, and generally handled the day-to-day requirements of life without too much trouble. More recently, however, he has started to experience more problems in his day-to-day functioning, and decided to see his doctor. Based on the exam, his doctor diagnosed him with a serious depression.

Alternate Case 3 - Alzheimer's Dementia.

Bill is a 56-year-old man. In the past, he has had no serious physical or mental problems, and generally handled the day-to-day requirements of life without too much trouble. More recently, however, he has started to experience more problems in his day-to-day functioning, and decided to see his doctor. Based on the exam, his doctor diagnosed him as being in the initial stages of a dementia known as Alzheimer's disease.

COMMUNITY SURVEY - RATING SCALE 1

Each of the following items describes some type of problem. For each item, please rate how likely it is that an average person would have that problem. Next, please rate how likely it is that a person with a mild brain injury would have that problem. Then, please rate how likely it is that a person with a serious depression would have that problem. That is, for each item, you are to do a rating for an average person, a person with a mild brain injury, and a person with serious depression.

	1 Very Unlikely or No Chance	2 Unlikely	3 Somewhat Likely	4 Likely	5 Very Likely or For Sure																																																
	<table><tr><th>Average</th><th>Mild Brain Injury</th><th>Depression</th></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr><tr><td>1 2 3 4 5</td><td>1 2 3 4 5</td><td>1 2 3 4 5</td></tr></table>					Average	Mild Brain Injury	Depression	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
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1. Forgetting major childhood memories																																																					
2. Forgetting how to write numbers																																																					
3. Feeling dizzy																																																					
4. Frequently feeling hopeless about the future																																																					
5. Often forgetting recent conversations																																																					
6. Difficulty drawing simple figures																																																					
7. Often irritable																																																					
8. Very sensitive to light (turning down lights, constantly needing sunglasses)																																																					
9. Weight loss of 10 or more pounds when not trying to diet																																																					
10. Often dropping things because of lack of coordination																																																					
11. Often feeling nauseous																																																					
12. Little or no sense of smell																																																					
13. Just can't keep a job																																																					
14. Difficulty riding a bicycle																																																					
15. Forgetting what they like to eat																																																					
16. Times when they cannot move parts of their bodies																																																					

	1 Very Unlikely or No Chance	2 Unlikely	3 Somewhat Likely	4 Likely	5 Very Likely or For Sure
			Average	Mild Brain Injury	Depression
17. Getting lost on the way home from very familiar places			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
18. Poor hearing			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
19. Difficulty recognizing familiar things, for example, not knowing a chair or pen when they see it			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
20. Unable to see colors, everything is black and white			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
21. Being very suspicious of others			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
22. Feeling sad or depressed most of the time			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
23. Feeling tired or worn out after simple activities such as getting something off a shelf			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
24. Feeling numbness or tingling in hands			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
25. Forgetting what they had for breakfast			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
26. Problems spelling their name			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
27. Hearing ringing in their ears			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
28. Full sentences come out backwards more than once a day			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
29. Even rather quiet noises bother them a lot (need to turn down the TV/radio)			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
30. Sleeping too long leads to more headaches			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
31. Medicines have much more of an effect than they have for most people			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
32. Often unable to recognize family members or close friends			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
33. People telling them that their personality has changed a great deal			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

	1 Very Unlikely or No Chance	2 Unlikely	3 Somewhat Likely	4 Likely	5 Very Likely or For Sure
			Average	Mild Brain Injury	Depression
53. Often sees things wrong, such as believing a door is a window			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
54. When others talk, it sounds like a foreign language			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
55. Difficulty recognizing dangerous situations			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
56. Extreme weakness in their hands, for example, they can't turn a doorknob			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
57. Difficulty preparing a basic meal			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
58. Little or no interest in sex			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
59. Often act without thinking			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
60. Problems following doctor's orders for taking medicines			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
61. Very low energy most of the time			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
62. Problems getting help in emergencies, for example, forgetting how to contact the police			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
63. Frequent problems using public transportation, for example, repeatedly getting on the wrong bus			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
64. Familiar games, like checkers or cards don't make sense			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
65. Difficulty turning on simple equipment, such as the TV			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
66. Neglecting daily hygiene (not brushing teeth or showering)			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
67. Difficulty staying balanced when walking			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
68. Forgetting the names of close friends or family members			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
69. Can't follow a simple movie			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

1
Very Unlikely
or No Chance

2
Unlikely

3
Somewhat
Likely

4
Likely

5
Very Likely
or For Sure

	Average	Mild Brain Injury	Depression
70. Little or no sense of taste	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
71. Constantly making careless mistakes at work	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
72. Feeling nervous most of the time	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
73. Sleeping 2-4 extra hours on most days	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
74. Thinking is slowed down quite a bit, for example, needing people to speak slower	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
75. Don't dream anymore	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Course Section

We are also very interested in finding out what people know about the course of recovery for people with mild brain injuries. Meaning, what happens to their symptoms over time.

Please circle your answers.

1. Suppose a person experienced a mild brain injury. Over the first few days following their injury, do you think most of their problems will Get Better? Get Worse? Stay the Same?
2. What about over the first few weeks ?Get Better Get Worse Stay the Same
3. What about within several months?..... Get Better Get Worse Stay the Same
4. What about within a year? Get Better Get Worse Stay the Same
5. What about after a year? Get Better Get Worse Stay the Same
6. When, if at all, do you think their problems will be all better? (please check off your answer)

After:

- ☐ A few days
- ☐ A few weeks
- ☐ A few months
- ☐ A year
- ☐ Several years
- ☐ Never

Please use the following scale to rate the likelihood of these symptom changes within the first year following a mild brain injury:

	1	2	3	4	5
	Very Unlikely or No Chance	Unlikely	Somewhat Likely	Likely	Very Likely or For Sure
1. Some of their symptoms will get better , but others will get worse					1 2 3 4 5
2. Some of their symptoms will get better , but others will stay the same					1 2 3 4 5
3. Some of their symptoms will get worse , but others will stay the same					1 2 3 4 5
4. They will have weeks of time when they function like their old selves, but then their problems will suddenly come back					1 2 3 4 5
5. Some symptoms might go away for years and then come back					1 2 3 4 5

COMMUNITY SURVEY - RATING SCALE 2

Each of the following items describes some type of daily task or activity. For each item, please rate how much trouble, if any, an average person would have with that task. Next, please rate how much trouble, if any, a person with a mild brain injury would have with that task. Then, please rate how much trouble, if any, a person with a serious depression would have with that task. That is, for each item, you are to do a rating for an average person, a person with a mild brain injury, and a person with a serious depression.

	1 No Trouble	2 Slight Trouble	3 Moderate Trouble	4 Severe Trouble	5 Unable to Do
			Average	Mild Brain Injury	Depression
1. Organizing a daily schedule			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Controlling their emotions, not over-reacting			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Learning new things			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
4. Remembering things cooking on the stove			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
5. Keeping ideas in their head			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6. Remembering names of common objects (for example, remembering the word for rocking chair, stereo, or hinge)			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
7. Using a familiar answering machine			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
8. Remembering the day of the month			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
9. Paying attention at important times			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
10. Budgeting money			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
11. Coordinating a dinner party			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
12. Keeping the house clean			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
13. Understanding what people say			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
14. Setting the time on a microwave			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
16. Making decisions about basic things, such as what to wear or eat			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
17. Following instructions from supervisors at work			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

	1 No Trouble	2 Slight Trouble	3 Moderate Trouble	4 Severe Trouble	5 Unable to Do
			Average	Mild Brain Injury	Depression
18. Remember to pay bills on time, even when they have the money			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
19. Handling money (making change, checking change received from cashier)			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
20. Typing			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
21. Understanding TV news stories			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
22. Being able to concentrate for an hour or more			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
23. Programming their VCR to tape a show			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
24. Balancing a checkbook			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
25. Following a new recipe			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
26. Getting up on time in the morning			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
27. Working long hours			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
28. Keeping up with current events			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
29. Figuring out the amount of money for tips			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
30. Following directions to a new place			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
31. Remembering appointments			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
32. Remembering 3-5 grocery items without a list			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
33. Finding keys, wallet, or purse			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
34. Using a computer			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
35. Difficulty dialing the phone correctly			1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

COMMUNITY SURVEY - PARTICIPANT INFORMATION QUESTIONS AND SCREENING FOR PARTICIPANT KNOWLEDGE OF SURVEY CONTENTS

(AT THE END OF THE SURVEY - Read to all participants in order to get correct information for TBI screening)

These following questions are intended to get some background information about the people completing the survey. You do not have to answer, but we would appreciate the information.

1. How old are you? _____ **2. Gender:** Male Female

3. What is the highest grade of school you completed? _____

4. Are you currently working? Yes No

5. What is your present job, or the last job you held? _____
(WRITE DOWN ONLY THE TYPE OF JOB THEY HELD, NOT THEIR TITLE OR PLACE OF EMPLOYMENT)

6. Do you identify yourself with any cultural group? _____
IF YES: Which one? _____

7. Have you ever had a head injury? YES NO
(If "NO," probe with questions 8 and 9, if "YES" get specifics)

8. Ever been knocked unconscious? Knocked out? YES NO
(If NO, prompt with - "Even for a short time?" YES NO)

9. Did you (ever) hit your head hard enough that you couldn't remember things that were happening at the time?
YES NO

if YES to any above - probe for specifics, e.g. what happened, emergency room, hospitalization, LOC, PTA, symptoms, treatment

10. How much do you know about head injury?

(If necessary, prompt with the following: never heard a thing about it, a little, a good amount, more than most people)

(If they answer NOTHING, than prompt with "you've never heard anything about it?" to see if they've ever heard about it)

11. Follow up by asking: Where did you get your information?

(If necessary, prompt with knowing someone, TV, classes, magazine articles, etc.)

12. How much do you know about depression?

(If necessary, prompt with the following: never heard a thing about it, a little, a good amount, more than most people)

(If they answer NOTHING, than prompt with "you've never heard anything about it?" to see if they've ever heard about it)

13. Follow up by asking: Where did you get your information?

(If necessary, prompt with knowing someone, TV, classes, magazine articles, etc.)

Appendix B

Materials for the Validation Study²

² Note. Additional titles have been added to some of the materials to aid in clarity. The overall content of the materials has not changed from that presented to the participants.

**Mild Head Injury Scale Development - University Sample
CONSENT FORM FOR RESEARCH**

You have been asked to take part in the research described below, which is being done by researchers at the University of Rhode Island. The project will be explained to you, and you can ask any questions about participation in the study. If you have more questions later, you can call Margaret Ackley, M.S., or David Faust, Ph.D. (874-2193), the people mainly responsible for the study.

YOU MUST BE AT LEAST 18 YEARS OLD TO BE IN THIS RESEARCH PROJECT.

Description of the project: This project is one of several studies in the development of a scale intended to distinguish between mild brain injury and people faking a brain injury for financial compensation.

What will be done: If you take part in this study, you will complete a questionnaire that will take about 40-60 minutes. This questionnaire consists of items which may help distinguish between a true brain injury and people faking an injury. You will be asked several questions to help determine if you ever had a significant head injury. You will be asked to either answer our questionnaire honestly, or to exaggerate, or fake your responses to look as if you have had a brain injury. At the end of the questionnaire, you will be asked to complete a short form regarding your understanding and compliance with our instructions, and also to provide some demographic information.

Risks or discomfort: The possible risks or discomforts of the study are minimal, although you may find some of the questions difficult to answer. Also, some of the questions are personal, and you may feel slightly uncomfortable sharing this information.

Benefits of the study: You will not benefit directly for taking part in this study. However, the researchers may learn more about people's knowledge of head injury. This information will be used to develop ways to identify people with brain injuries and identify people who may be faking an injury.

Confidentiality: Your part in this study is confidential. None of the information on the questionnaire will identify you by name. No one can know if you participated in this study, and no one can find out what your answers are. All materials are pre-coded to ensure confidentiality. Although your initials and 4 digits of your social security number will be on your materials, these identifiers

will be changed after your responses are entered into our computer. Reports will be based on group information and will not identify you personally in any way.

Decision to quit at any time: The decision to take part in this study is up to you. You do not have to participate, and you can refuse to answer any question. If you decide to take part in the study, you may quit at any time. Whatever you decide will in no way penalize you. However, you will need to fulfill your research requirement for class in some other way if you do not complete the study. If you wish to quit, you can simply inform the researcher, or you can call Margaret Ackley (874-2193) at any time during this research.

Rights and Complaints: If you are not happy with the way this study is done, you may discuss your complaints with Margaret Ackley, M.S., or David Faust, Ph.D. (874-2193). You may also contact the office of the Vice Provost for Research, 70 Lower College Rd., Suite 2, University of Rhode Island, Kingston, RI, telephone: (401) 874-2635.

You are at least 18 years old. You have read the consent form and your questions have been answered to your satisfaction. Your filling out this questionnaire implies your consent to participate in this study.

Head Injury Screen

I am studying what people know about mild brain injury and ways people may fake symptoms of a brain injury. Because of this, I need to know whether you have experienced any head injuries. Please answer the following questions. If you are not sure of what the question is asking, please ask the researchers.

1. Have you ever hit your head and: lost consciousness (were knocked out), and/or your memory completely stopped working for some time and you could not remember anything about what was going on?

YES NO

IF NO, please go to **ITEM 5**.

1a. **IF YES**, how long were you out for, and/or how long was it before your memory started working again? If you had both of these problems for some time, indicate the longer period of time. Please check your best estimate.

☐ seconds	☐ 12 - 24 hours
☐ 1 - 20 minutes	☐ more than a day, but less than a week
☐ 20 - 30 minutes	☐ more than a week, but less than a month
☐ 30 minutes - 1 hour	☐ over a month
☐ 1 - 12 hours	

2. Were any of these head injuries in the past 2 years? YES NO

2a. **If YES**, when (please indicate all head injuries)? _____

2b. **If NO**, how old were you when you had this head injury (injuries)? _____

3. Did you have **ANY lasting effects** from **any** of these head injuries?

YES NO

3a. **If YES**, please indicate which head injury (injuries). When: _____

4. Are any problems **still present**? YES NO

4a. **If YES**, how **serious** are these problems?

☐ Very Mild	☐ Moderate
☐ Mild	☐ Moderate to Severe
☐ Mild to Moderate	☐ Severe

5. PLEASE PUT YOUR INITIALS AND THE LAST 4 DIGITS OF YOU SOCIAL SECURITY NUMBER BELOW AND BRING THIS FORM TO THE RESEARCHER

Initials Last 4 Digits of SS #

INSTRUCTIONS: (for “NORMAL” group)

You will be completing a questionnaire that describes characteristics, abilities, preferences and problems that may or may not occur after a mild to moderate brain injury.

The following questionnaire is designed for individuals who have experienced a brain injury, but we also want to know how people who have not had a brain injury would respond to the items. Thus, when you answer the questions, please describe yourself as accurately as possible.

Because the questionnaire is designed for individuals who have had head injuries, some questions refer to an injury, for example, “Since my injury, I eat more.” Of course, since you have not had a head injury, this wording does not apply directly to you. So, here is what you are to do with these types of items:

ANY time you see a reference to an injury, just substitute the phrase “since 1998” and then answer the question as it applies to you. In other words, we want you to read these items as if they were asking you how you have felt SINCE 1998.

For example, “Since my injury, I eat more.” We want you to read this type of item as if it was asking how you have felt SINCE 1998 – for example, “Since 1998, I eat more.” Or “Before my injury, I had more free time than I do now,” should be read as “Before 1998, I had more free time than I do now.”

Two Important Reminders:

- 1. It is very important that you keep this 2 year time frame in mind when answering this questionnaire.**
- 2. When answering questions, please try to describe yourself as accurately as possible.**

If the item is **TRUE** or **MOSTLY TRUE**, answer **TRUE (T)**.

If the item is **FALSE** or **MOSTLY FALSE**, answer **FALSE (F)**.

Please circle your answers.

PLEASE TRY TO ANSWER EVERY ITEM.

If you have any questions, please ask the researcher.

Additional instructions for NORMAL group for the last 35 items (# 438 - # 472):

Because this questionnaire is designed for individuals with head injuries, and you have not had an injury, some of our questions could not be answered by following the instructions given to you at the beginning of the questionnaire.

Therefore, for the following items, please pretend that you had a head injury in 1998 that caused **no problems**. Please answer these items as they would apply to you, given that you had this "injury" and suffered no problems.

If you have any questions, please ask the researcher.

INSTRUCTIONS: (for MALINGERING group)

You will be completing a questionnaire that describes characteristics, abilities, preferences and problems that may or may not occur after a mild to moderate brain injury.

What the researchers want to know is whether, or how often, people who are faking or exaggerating symptoms of a brain injury will endorse these characteristics and problems.

We want you to pretend that you were involved in a head-on collision 2 years ago, in 1998, caused by a careless driver. Your head hit the windshield and you lost consciousness (blacked out). Also, you remember nothing that went on for the next several hours. You were examined at the hospital, diagnosed with a mild brain injury, and were discharged for follow-up care. In truth, your problems got better quickly, and you are feeling like your old self, but you have not told anyone.

You are suing the driver who hit you. You know you may get a lot of money if you look like you are still suffering from problems. You are sent to a health professional to evaluate your case. As part of the evaluation, you are asked to complete the questionnaire that follows. As you know, professionals realize that people may fake or exaggerate problems. The more impaired you seem, without being detected as faking or exaggerating, the more money you are likely to receive.

Assume you are being asked these questions today, in the year 2000, 2 years after the 1998 injury.

Two Important Reminders:

1. **It is very important that you keep the 2 year time frame since the injury in mind when answering this questionnaire.**
2. **You want to seem as impaired as possible, but not to the point that you won't be believed.**

With this in mind,

If the item is **TRUE** or **MOSTLY TRUE**, answer **TRUE (T)**.

If the item is **FALSE** or **MOSTLY FALSE**, answer **FALSE (F)**.

Please circle your answers.

PLEASE TRY TO ANSWER EVERY ITEM.

If you have any questions, please ask the researcher.

Traumatic Brain Injury Questionnaire - Items

PLEASE CIRCLE YOUR ANSWERS

1.	I am usually on time.	T	F
2.	I can usually follow conversations.	T	F
3.	I have started to sweat and did not know why.	T	F
4.	I get overwhelmed very easily.	T	F
5.	I frequently have headaches.	T	F
6.	Since my injury, my eyes have been very sensitive to light.	T	F
7.	I notice that I start projects and can't seem to complete them.	T	F
8.	It is difficult to shower or bathe myself.	T	F
9.	I have had periods of time in which I forget who I am.	T	F
10.	At times I cannot move parts of my body.	T	F
11.	Since my injury, I lost almost all of my interest in sex.	T	F
12.	My partner or friends have remarked that my place is a mess.	T	F
13.	I have seen a number of doctors who just don't take my complaints seriously enough.	T	F
14.	I never judge someone that I know nothing about.	T	F
15.	I have trouble remembering things cooking on the stove.	T	F
16.	Even extra sleep hardly helps my problems at all.	T	F
17.	At times my pulse has been irregular.	T	F
18.	I am OK at budgeting money.	T	F
19.	A number of doctors I have seen are just in it for the money.	T	F
20.	People often have to repeat what they've told me.	T	F
21.	I exercise as much as I ever did.	T	F
22.	Since my injury, I have lost memories of major events in my life.	T	F
23.	It bothers me if people make fun of me.	T	F
24.	I always tell the truth.	T	F
25.	I feel tired or worn out after simple activities, like getting something off a shelf.	T	F
26.	At times I lose my breath.	T	F
27.	I often forget my appointments.	T	F

28.	I notice many unfamiliar words in newspapers and magazines.	T	F
29.	I enjoy organizing events with my friends.	T	F
30.	I have never had a rash or skin problem that worried me.	T	F
31.	I get frustrated trying to have conversations with more than one person.	T	F
32.	I frequently see a bright light (aura) before a headache starts.	T	F
33.	Since my injury, nothing seems to bother me.	T	F
34.	I usually enjoy the time I spend with others.	T	F
35.	I notice that I can see best with one eye closed.	T	F
36.	When I become tired, one of my hands usually becomes very shaky.	T	F
37.	Since my injury, some of my problems got worse, and others stayed the same.	T	F
38.	It is difficult to shop for groceries by myself.	T	F
39.	I often get "pins and needles" around my neck and shoulders.	T	F
40.	I have problems matching my outfits.	T	F
41.	I have a lot of difficulty keeping ideas in my head.	T	F
42.	Since my injury, I've been unable to see colors.	T	F
43.	I never had a headache before my head injury.	T	F
44.	Often, I am not certain that cashiers are giving me the correct change.	T	F
45.	I have difficulty walking down stairs.	T	F
46.	Since my injury, my thinking has slowed down quite a bit.	T	F
47.	I am almost always tense and up-tight.	T	F
48.	I can accomplish things at work if given the support I need.	T	F
49.	I have not touched a drop of alcohol since my injury.	T	F
50.	Sometimes a pain starts in my head and moves somewhere else in my body.	T	F
51.	I sometimes hear things that others can't.	T	F
52.	For seconds or minutes, my mind will go completely blank and nothing makes sense.	T	F
53.	I have strong political opinions.	T	F
54.	I can sometimes attend or concentrate for a few hours, if I take occasional breaks.	T	F
55.	I have numbness in the tips of my fingers.	T	F

56.	I frequently feel on top of the world.	T	F
57.	I usually know right away what other people are like.	T	F
58.	I can never think of the right thing to say.	T	F
59.	I often lose control when I get angry.	T	F
60.	Since my injury, I am unable to set the time on my microwave.	T	F
61.	There are times when I can't follow a simple movie plot.	T	F
62.	My senses have decreased since my injury.	T	F
63.	Others do not give me enough of a chance to prove what I can do.	T	F
64.	I can only focus on one thing at a time.	T	F
65.	Since my injury, I no longer enjoy the same foods.	T	F
66.	If I don't write everything down, I won't remember it.	T	F
67.	I do not trust myself to use something sharp like a knife.	T	F
68.	I am worried that my condition is much worse than people have told me.	T	F
69.	I see best under fluorescent lights.	T	F
70.	I have no trouble getting up on time in the morning.	T	F
71.	Since my injury, I have much less patience for other people.	T	F
72.	Even when I get tired, my vision seems OK.	T	F
73.	My typing skills are as good as they have ever been.	T	F
74.	Since my injury, some of my problems have gotten worse over time.	T	F
75.	I have never failed to follow a doctor's recommendation that I thought would improve my situation.	T	F
76.	Since my injury, I am much less able to manage things day to day.	T	F
77.	People seem oddly different to me since my head injury.	T	F
78.	I have not noticed any change in my sense of smell.	T	F
79.	Since my injury, I have had difficulty recognizing dangerous situations that others recognize easily.	T	F
80.	I am very suspicious of others.	T	F
81.	I have headaches in which an entire side of my head hurts and the other side of my head is perfectly OK.	T	F
82.	I am often misunderstood.	T	F
83.	My coordination is so bad, that I can hardly pour a drink without spilling it.	T	F

84.	At times I see things that are not there.	T	F
85.	When people speak too fast, I get dizzy.	T	F
86.	I can remember the major events in my life from before my injury.	T	F
87.	Watching television has become a chore.	T	F
88.	I have trouble maintaining my train of thought.	T	F
89.	After my injury, I noticed that I have more tolerance for alcohol.	T	F
90.	There are many things I do well.	T	F
91.	People always enjoy my company.	T	F
92.	I have no difficulty dialing the phone correctly.	T	F
93.	I am unable to work long hours.	T	F
94.	Since my injury, some of my problems got better, and others stayed the same.	T	F
95.	I often need people to speak slower.	T	F
96.	When I make math mistakes, I'm usually very close to the right answer.	T	F
97.	I have been told that I use too much cologne/perfume.	T	F
98.	At times my speech becomes slurred.	T	F
99.	I have not noticed any change in my sense of balance.	T	F
100.	My sex life is better than ever.	T	F
101.	Loud, busy places seem to sometimes help my problem with dizziness.	T	F
102.	I have no trouble with my vision.	T	F
103.	Is it easy for me to give up my bad habits.	T	F
104.	My handwriting is as neat as ever.	T	F
105.	I am angered rather easily.	T	F
106.	Since my injury, my thinking isn't as sharp as it used to be.	T	F
107.	I have no trouble keeping up with current events.	T	F
108.	At times I can't breathe.	T	F
109.	It takes me a long time to think of what I want to say.	T	F
110.	I have lost touch with who I was, what I was, and how I was before my injury.	T	F
111.	I look at pictures and headlines in newspapers rather than reading whole stories.	T	F
112.	My knees and elbows feel tight.	T	F
113.	I always assume others try to do the right thing.	T	F

114. I do not have any trouble programming my VCR to tape a show.	T	F
115. I am always in pain.	T	F
116. I have trouble making and keeping friends.	T	F
117. I often feel nauseous.	T	F
118. I have little or no sense of smell.	T	F
119. Since my injury, I've needed to buy darker sunglasses.	T	F
120. People feel I've been out of work/school for too long.	T	F
121. Once I get upset, I stay upset for hours.	T	F
122. Since my injury, I don't dream anymore.	T	F
123. Everything smells the same.	T	F
124. Drinking alcohol makes my problems worse.	T	F
125. It is difficult to see something unless it is directly in front of me.	T	F
126. I have almost no interest in things I used to enjoy before my injury.	T	F
127. I often mix up the past with the present.	T	F
128. On some days my voice becomes much too loud, and on other days much too soft.	T	F
129. My hands and feet are usually warm enough.	T	F
130. Since my injury, my concentration, although bad at first, has improved over time.	T	F
131. I am often the one others seek out to help them make decisions.	T	F
132. At times I lose the ability to feel pain.	T	F
133. I believe that most people can overcome most difficulties if they try hard enough.	T	F
134. I might have problems getting help in emergencies, like forgetting how to call for help.	T	F
135. I can't work for even relatively short periods of time.	T	F
136. At times I have trouble remembering the names of common objects, like remembering the word for rocking chair, stereo, or hinge.	T	F
137. I enjoy working as much as I ever did.	T	F
138. I use alcohol to dull the pain.	T	F
139. At times a thought sticks in my head and I can't think of anything else.	T	F
140. I get lost easily.	T	F

141. Since my injury, there seems to be nothing I can do well anymore.	T	F
142. I don't care as much about things as I did before my injury.	T	F
143. I have difficulty paying attention in crowded, noisy places.	T	F
144. My memory is so bad that I forget what I've had for breakfast.	T	F
145. At times I forget the color of my car.	T	F
146. I have forgotten phone numbers that I knew very well before my injury.	T	F
147. I have mood swings.	T	F
148. I lose my balance easily.	T	F
149. I've noticed that my hearing has gotten a bit better since my injury.	T	F
150. I often misplace things.	T	F
151. I get excited very easily.	T	F
152. I constantly need to wear sunglasses.	T	F
153. My problems have been getting worse over time.	T	F
154. I have trouble remembering the day of the month.	T	F
155. When I hear a loud noise I feel a tingling sensation in my neck.	T	F
156. I avoid going down stairs because I am afraid I will fall.	T	F
157. Since my injury, I get headaches more often.	T	F
158. I have a quick fuse.	T	F
159. I often forget recent conversations.	T	F
160. Since my injury, I lost my ability to use a computer.	T	F
161. I need to set my TV or radio louder than most people.	T	F
162. I can't remember to pay bills on time, even when I have the money.	T	F
163. I have no trouble following a new recipe.	T	F
164. I am unable to balance my checkbook.	T	F
165. I find it difficult to make simple decisions.	T	F
166. I am unable to figure out the amount of money to leave for a tip.	T	F
167. Trying to do more than one thing at a time is nearly impossible for me.	T	F
168. My job/school performance has not changed since my injury.	T	F
169. When I get upset I feel like swearing.	T	F

170.	Since my injury, I am much worse at judging the amount of time it will take me to do things.	T	F
171.	Maybe it's because my mind is dulled already, but if I have one or two drinks I hardly notice any effect.	T	F
172.	Turning on simple equipment, like the TV, is difficult for me.	T	F
173.	I often feel uneasy on my feet.	T	F
174.	I tend to use a lot of seasoning on my food.	T	F
175.	I keep all of my doctor's appointments and follow all of her/his directions.	T	F
176.	At times I see colored spots.	T	F
177.	My eyesight is the same as it was before my injury.	T	F
178.	My future is in my control.	T	F
179.	Since my injury, I can't even cope with life's minor irritations.	T	F
180.	I can't remember a phone number even if I repeat it over and over in my head.	T	F
181.	I have no trouble organizing my daily schedule.	T	F
182.	I don't seem to handle changes in my life nearly as well as others do.	T	F
183.	Often, I can't recognize family members or close friends.	T	F
184.	I never worry about how I look.	T	F
185.	At times I forget very familiar things, like my phone number or address.	T	F
186.	I frequently feel hopeless about the future.	T	F
187.	I never daydream.	T	F
188.	Since my injury, it often takes me five or ten times longer to do even simple things, such as write a short note.	T	F
189.	I have difficulty chewing.	T	F
190.	My eyesight is worse than it has ever has been.	T	F
191.	I really enjoy talking with people in groups.	T	F
192.	When waiting in lines I get angry with people who cut in front of me.	T	F
193.	I am convinced that I'll never be the same as I was before my injury.	T	F
194.	Since my injury, I have had more difficulty drawing simple figures.	T	F
195.	I keep track of all the household finances.	T	F
196.	I read for pleasure as much as I ever did.	T	F

197.	Now, I am much more sensitive to strong odors than I was before my injury.	T	F
198.	I have no trouble making decisions about basic things, such as what to wear or eat.	T	F
199.	I very seldom get headaches.	T	F
200.	I have periods in which lost memories from the past come flooding back to me.	T	F
201.	My emotions feel more intense since my injury.	T	F
202.	I have a ringing in my ear that just won't go away.	T	F
203.	I have trouble learning new things.	T	F
204.	I feel nauseous during my headaches.	T	F
205.	Even rather quiet noises bother me a lot.	T	F
206.	I feel that I have to play up my problems to get what I need.	T	F
207.	Since my injury, my spelling has become much worse.	T	F
208.	I have trouble sitting still.	T	F
209.	Since my injury, I have lost almost all interest in regular social activities that I used to enjoy.	T	F
210.	I have no trouble finding my keys, wallet, or purse.	T	F
211.	At times my sense of smell seems much sharper than usual.	T	F
212.	I feel tingling sensations in my brain.	T	F
213.	I appreciate criticism from others.	T	F
214.	I constantly underestimate the time it will take me to get things done.	T	F
215.	Most of the time, I have little or no patience.	T	F
216.	Since my head injury, I have had difficulty with simple driving activities, like turning a corner.	T	F
217.	I am unable to follow directions to a new place.	T	F
218.	I do not have any trouble following instructions from supervisors at work.	T	F
219.	I have difficulty falling asleep.	T	F
220.	I am a more creative lover since my injury.	T	F
221.	I have little trouble coordinating a dinner party.	T	F
222.	Because of my problems, I get confused about doctor's orders for taking medicines.	T	F
223.	My vision is often blurry.	T	F
224.	I have a very high energy level on most days.	T	F

225. My memory is worse in the evening.	T	F
226. No matter how many times I hear something, I cannot seem to remember it at all.	T	F
227. If I follow a set routine, I seem to function considerably better.	T	F
228. I hear fluid-like sounds when I move my head quickly.	T	F
229. I frequently lose track of conversations or zone out when talking with friends.	T	F
230. I constantly make careless mistakes at work.	T	F
231. I frequently arrive in a new place and feel as if have been there before.	T	F
232. I am much less involved with others since my injury.	T	F
233. At times I have felt like I was looking at myself from outside my body.	T	F
234. I need to write notes to myself to turn off the stove or lock the doors when I leave.	T	F
235. My family and friends are concerned about my drinking.	T	F
236. I do not enjoy books.	T	F
237. Since my injury, I sleep 2-4 extra hours a day.	T	F
238. I can't remember 3-5 grocery items without a list.	T	F
239. Everything looks black and white.	T	F
240. I am often doing more than one thing at a time.	T	F
241. At times I neglect my daily hygiene, for example I do not brush my teeth or shower.	T	F
242. I often drop things because I lack coordination.	T	F
243. I frequently can't find the right words.	T	F
244. I tend to keep all of my "junk mail" because I can't decide what to throw out.	T	F
245. I am usually in control of my actions.	T	F
246. I frequently get tunnel vision.	T	F
247. Whenever I sleep too long, I get more headaches.	T	F
248. I often see things wrong, such as believing a door is a window.	T	F
249. Since my injury, my sleeping habits have not changed.	T	F
250. I am seldom on time.	T	F
251. I always listen as carefully as I can to what others are saying.	T	F
252. I often cannot remember a word, but it's "on the tip of my tongue."	T	F

253. I often act without thinking.	T	F
254. I often need to read things several times to understand them.	T	F
255. Before my injury, I was a much happier person than I am now.	T	F
256. I'm not sure why, but I enjoy sex a lot less now, than I did before my injury.	T	F
257. Before my injury, there was no problem I could not overcome.	T	F
258. I find I need less sleep these days.	T	F
259. I wake up rested.	T	F
260. At times I see things that others do not see.	T	F
261. At times I become so dizzy that I fall down.	T	F
262. My skin is extremely sensitive to cold and heat.	T	F
263. I am very easily frustrated.	T	F
264. My whole life is a mess.	T	F
265. Since my injury, I feel like a different person in my old body.	T	F
266. My hands are extremely weak, for example, I can't turn a doorknob.	T	F
267. I often have to cancel doctor's appointments because I feel too poorly to go.	T	F
268. My sense of taste has not changed.	T	F
269. My memory seems to be getting a little worse day by day.	T	F
270. I have an extensive library of articles on head injury.	T	F
271. I drink less alcohol since my injury.	T	F
272. I am quick to react physically to confrontation.	T	F
273. Since my injury, I have burnt food many times because I forgot I was cooking it.	T	F
274. My appetite has changed significantly since my injury.	T	F
275. My headaches last for several hours.	T	F
276. I have difficulty participating in conversations on the telephone.	T	F
277. I have difficulty understanding what I read.	T	F
278. Exercising makes me feel worse.	T	F
279. At times I have felt that the world around me is not real.	T	F
280. Others say I have become more social since my injury.	T	F
281. I have difficulty distinguishing odors.	T	F

282.	I frequently feel threatened or upset while driving/riding through traffic.	T	F
283.	I am concerned that my boss will replace me if I don't go back to work soon.	T	F
284.	I have trouble sleeping.	T	F
285.	Some professionals have been helpful in pointing out various problems I had, that I didn't even realize I had.	T	F
286.	I often notice my muscles twitching.	T	F
287.	I worry more since my injury.	T	F
288.	If I practice materials a few extra times, I often can remember it fairly well.	T	F
289.	I have difficulty writing a simple message or note.	T	F
290.	I sometimes become so spaced out that I cannot even recognize someone calling my name.	T	F
291.	At times I can't focus my eyes at all.	T	F
292.	I don't think I could perform even a simple job.	T	F
293.	I have very low energy most of the time.	T	F
294.	Since my injury, I have forgotten how to spell many words.	T	F
295.	Since my injury, I get drunk easier.	T	F
296.	Since my injury, my appetite has decreased.	T	F
297.	At times I can't understand what others say even though I hear them talking.	T	F
298.	I have trouble swallowing.	T	F
299.	I feel like I will never work again.	T	F
300.	When I get my normal sleep, a number of my problems improve.	T	F
301.	Even a few minutes of activity seem to wear me out.	T	F
302.	I drive as much as I ever did.	T	F
303.	It is simple things that give me the most trouble.	T	F
304.	I feel sad or depressed most of the time.	T	F
305.	I find it very hard to have conversations when there is background noise.	T	F
306.	I often buy expensive things on impulse.	T	F
307.	I usually do not have difficulty paying attention at important times.	T	F
308.	Alcohol affects me differently than other people.	T	F
309.	I have re-read entire books or magazine articles without realizing I had read them before.	T	F

310.	There are times when I am unable to write letters of the alphabet.	T	F
311.	It is hard to remember what happened earlier today.	T	F
312.	When my doctors have made suggestions, I have followed them.	T	F
313.	I often have nightmares.	T	F
314.	At times I do not recognize very familiar people.	T	F
315.	I talk much faster since my injury.	T	F
316.	I feel strange sensations on my scalp when I comb or brush my hair.	T	F
317.	Since my injury, I am unable to keep my house clean.	T	F
318.	Since my injury, I have had little or no sense of taste.	T	F
319.	Other people constantly get on my nerves.	T	F
320.	I can not financially support the people I care about.	T	F
321.	Since my injury, I seem to be slower learning new information.	T	F
322.	Generally, I am more relaxed now than I was before my injury.	T	F
323.	Since my injury, I drink more alcohol than I used to.	T	F
324.	I have been so irritable that I find myself yelling at people I don't really know.	T	F
325.	There are a number of significant areas in which my functioning is about as good as it ever was.	T	F
326.	Since my injury, familiar games, like checkers or cards, don't make sense anymore.	T	F
327.	I frequently feel dizzy.	T	F
328.	I like to hang out in groups of people, rather than spend time with just one person.	T	F
329.	All colors look alike.	T	F
330.	At times I can't control a part of my body.	T	F
331.	Even dialing the phone has become very confusing since my head injury.	T	F
332.	On some days my body seems to hurt from head to toe.	T	F
333.	Since my injury, I have had twitching or sudden jerking movements of my body.	T	F
334.	I have lost most or all of my friends since my injury.	T	F
335.	I cry very easily.	T	F
336.	Since my injury, some of my problems got worse, but others got better.	T	F

337.	I have returned to places I have been to many times before and hardly recognized them at all.	T	F
338.	I almost never have trouble using my answering machine.	T	F
339.	I can understand TV news stories without difficulty.	T	F
340.	My friends say I have changed entirely since my injury, as if I am a completely different person.	T	F
341.	I have difficulty riding a bicycle.	T	F
342.	I have no trouble understanding what people say.	T	F
343.	I am overwhelmed easily in noisy public places like restaurants.	T	F
344.	I am often irritable.	T	F
345.	Since my injury, I have gained 10 or more pounds.	T	F
346.	My ability to concentrate is the same as it was before my injury.	T	F
347.	My teeth and gums have been more sensitive since my injury.	T	F
348.	I don't hear ringing in my ears.	T	F
349.	I always follow the doctor's advice, even if it makes me feel worse for awhile.	T	F
350.	I've been unlucky, in that I'm much worse off than others with similar problems.	T	F
351.	When I go to the doctor, I sometimes hide things that bother me.	T	F
352.	Sometimes I can't write down a word even though I know what word I want to write.	T	F
353.	I am concerned about paying all of my bills.	T	F
354.	At times I feel like my arms and legs are filled with lead.	T	F
355.	Since my injury, I have noticed a big change in my signature.	T	F
356.	I can keep track of time without a problem.	T	F
357.	I always have trouble controlling my emotions.	T	F
358.	I prefer it when others drive me places.	T	F
359.	I frequently meet someone for the first time and feel like I know him or her from somewhere.	T	F
360.	My spending habits have become reckless.	T	F
361.	At times I wake up in strange places and do not know how I got there.	T	F
362.	I am almost never in a good mood.	T	F

363. I find myself uncertain about the meaning of many words I recognized easily before my injury.	T	F
364. Before my injury, I could dance better than I do now.	T	F
365. I trust that others always tell the truth.	T	F
366. I am worried that my brain has been permanently damaged.	T	F
367. I have met a number of doctors who were less than fully honest.	T	F
368. I have more energy in the morning.	T	F
369. Words get jumbled when I try to read.	T	F
370. Since my injury, I have lost 10 or more pounds even though I was not trying to diet.	T	F
371. It is easier for me to remember what happened years ago than it is to remember what happened earlier today.	T	F
372. My drinking habits have not changed since my injury.	T	F
373. Since my injury, I have forgotten how to write numbers.	T	F
374. I am unable to understand things I read, even a simple newspaper story.	T	F
375. My sex life is the same now as it was before my injury.	T	F
376. I startle easily.	T	F
377. I am constantly very tired, even after a good night's sleep.	T	F
378. I frequently have problems using public transportation, like getting on the wrong bus.	T	F
379. I have trouble with double vision.	T	F
380. Caffeine in coffee or soft drinks affects me more than other people.	T	F
381. I often mix words up when speaking and use a word that means the opposite of what I intend to say, such as using "up" for "down."	T	F
382. I have the ability to smooth over conflicts as well as most people.	T	F
383. I have difficulty preparing a basic meal.	T	F
384. My arms and legs often go numb.	T	F
385. My hearing is poor.	T	F
386. Since my injury, it seems like my headaches never go away.	T	F
387. Since my injury, I have had periods of feeling fine and wonder if my problems are real.	T	F
388. Is it difficult for others to recognize how I am feeling.	T	F

389. I say full sentences backwards more than once a day.	T	F
390. Coworkers are often correcting my work.	T	F
391. I have been avoiding contact with others.	T	F
392. I frequently forget the names of close friends or family members.	T	F
393. I need to turn on every light in my home so I can see OK.	T	F
394. I frequently smell a strange odor before or during my headaches.	T	F
395. My emotions swing back and forth, from being very low to very high.	T	F
396. I rely on others to remind me of some of my former accomplishments.	T	F
397. I almost don't recognize the person I have become since my injury.	T	F
398. I enjoy listening to music as much as I ever did.	T	F
399. At times I have lots of energy.	T	F
400. I feel worthless most of the time.	T	F
401. I never have trouble making up my mind.	T	F
402. I'm very good at my job.	T	F
403. I have not noticed any change in my hearing due to my injury.	T	F
404. I have to stick to an exact schedule, or I forget things that need to be done.	T	F
405. I get lost on the way home from very familiar places.	T	F
406. Since my injury, I have lost a lot of strength in my arms.	T	F
407. Sometimes my scalp feels tender.	T	F
408. Since my injury, sour things taste more sour.	T	F
409. Medicines have much more of an effect on me than they have on most people.	T	F
410. I have sex a lot less often than I did before my injury.	T	F
411. I am rather easy-going.	T	F
412. I often feel like my mind is racing.	T	F
413. Before my injury, I never felt useless.	T	F
414. My memory is 10 times better for events before my injury than it is for events after my injury.	T	F
415. When other people talk, it sounds like a foreign language to me.	T	F
416. I often lose my balance if I move too quickly.	T	F

417. I always know what to do in a crisis.	T	F
418. Since my head injury, my facial expressions often fail to show my true feelings.	T	F
419. I always obey the law.	T	F
420. At times I feel like I have a band wrapped tightly around my head.	T	F
421. I just can't keep a job.	T	F
422. Before my headaches start, I often notice my hands become stiff and my movements slow down.	T	F
423. Since my injury, I occasionally have problems spelling my name.	T	F
424. I rely on a calculator for math problems that I could solve easily before my injury.	T	F
425. If people give me a hint, it often helps me remember.	T	F
426. Exercising helps me relax.	T	F
427. I am unable to handle money.	T	F
428. I do not have difficulty focusing my eyes.	T	F
429. I have difficulty getting dressed properly, for example, lining up buttons.	T	F
430. Since my injury, I sometimes have difficulty recognizing familiar things, like a chair or radio.	T	F
431. Almost every medication I have tried has caused more problems than it has solved.	T	F
432. I am always thirsty.	T	F
433. I sometimes see bright flashes of light when I move quickly.	T	F
434. I frequently lose track of time.	T	F
435. When I walk, I have difficulty staying balanced.	T	F
436. I have more problems than I can handle.	T	F
437. All food tastes about the same.	T	F
438. Some doctors just don't appreciate the seriousness of injuries such as mine.	T	F
439. I sometimes have weeks when I feel like I did before my injury, but then my problems suddenly come back.	T	F
440. It took me weeks or months to realize how bad my head injury was.	T	F
441. I don't remember anything that occurred immediately after my injury.	T	F
442. When I dream, I relive my head injury again and again.	T	F

443.	Every day I discover new strategies that help me to deal with my injury.	T	F
444.	Because of my injury, I have used up all of my sick time at work.	T	F
445.	Because of my injury, I have forgotten much of my childhood.	T	F
446.	During the first few weeks following my injury, my problems got better.	T	F
447.	At first I could remember the minutes and hours after my head injury, but gradually I lost almost all memory of these events.	T	F
448.	My head injury has decreased my functioning in almost every area of my life.	T	F
449.	I am much better now than I was immediately following the injury.	T	F
450.	Several months after my injury, my problems suddenly got worse.	T	F
451.	The people I work for (or used to work with) just don't understand the seriousness of my injury.	T	F
452.	I can remember everything that happened around the time of my injury.	T	F
453.	Since my injury, I had problems that went away for a considerable amount of time, but then came back.	T	F
454.	During the first few days following my injury, my problems got worse.	T	F
455.	I was able to return to work/school shortly after my injury.	T	F
456.	I believe I can fully recover from my injury.	T	F
457.	I believe that the problems from my injury will get worse over time.	T	F
458.	My injury has changed almost every aspect of my life.	T	F
459.	When I read, although my understanding of materials is not the same, I usually can still recognize words I knew before my injury.	T	F
460.	When I suffered my head injury, major events in my life flashed through my mind.	T	F
461.	My injury has caused so many problems that others cannot rely on me anymore.	T	F
462.	I believe that the problems from my injury will improve over time.	T	F
463.	The time around the injury is very confusing.	T	F
464.	I can remember what happened at the time of my injury down to the last detail.	T	F

465. My injury caused me to forget what I like to eat.	T	F
466. I believe that the problems from my injury will never get better.	T	F
467. My injury caused me to remember some memories I had forgotten.	T	F
468. Many of the problems I have had because of my head injury have improved over time.	T	F
469. During the first few days following my injury, my problems stayed the same.	T	F
470. I believe that my brain has been severely affected by my injury.	T	F
471. I have flashbacks of my head injury.	T	F
472. I was very disappointed when, after my injury, I returned to normal for some time but it did not last, and now I am worse off than ever.	T	F

PLEASE COMPLETE THE NEXT PAGE

PLEASE COMPLETE THIS FORM AFTER YOU HAVE FINISHED THE QUESTIONNAIRE:

Demographic Information

These following questions are intended to get some background information about the people completing our study. Please answer the following questions.

1. Age: _____

2. Gender: **Male** **Female**

3. Year in college: **Freshman** **Sophomore** **Junior** **Senior**

Other: _____

4. What is your major area of study _____

5. Do you identify yourself with any cultural group? **YES** **NO**

IF YES: Which one? _____

6. Have you ever had any serious illnesses or major medical problems (for example, hypothyroidism, encephalitis, seizures, meningitis, hydrocephalus, etc.)? **YES** **NO**

IF YES: Please describe:

7. Have you ever had any psychological illnesses? **YES** **NO**

IF YES: Please describe:

8. Have you ever been seen by a neurologist? **YES** **NO**

IF YES: Please describe:

9. Have you ever been diagnosed with attention deficit or a learning disability? **YES** **NO**

IF YES: Please describe:

10. Have you ever been hospitalized for a medical problem? **YES** **NO**

IF YES: Please describe:

Post-Experimental Questionnaire

We are very interested in the way you decided to answer our questionnaire. Please answer the following questions.

1. Please briefly state what you understood the instructions were:

2. Please circle the response which best describes **how easy** you found it to follow our instructions:

1	2	3	4	5
Not Easy/ Difficult	Slightly Easy	Somewhat Easy	Easy	Very Easy

3. Please circle the response that the best describes **how closely** you think you followed the instructions given to you:

1	2	3	4	5
Not Closely At All	Slightly Closely	Somewhat Closely	Closely	Very Closely

4. If you were instructed to fake or exaggerate the consequences of a head injury, did you try to do this?

YES

NO

Not Applicable

5. If you were instructed to fake or exaggerate the consequences of a head injury, how did you try to make your responses look like you suffered problems - in other words, what was your strategy in trying to look impaired?

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