



## COVER SHEET

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**This is the author-version of article published as:**

Sullivan, Karen and Lange, Rael and Dawes, Sharron (2005) Malingering base rates and detection methods in Australia. *Journal of Forensic Neuropsychology* 4(4):pp. 49-70.

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Methods of detecting malingering and estimated symptom exaggeration base rates in  
Australia.

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Abstract

Neuropsychology malingering base rates have not been widely investigated in Australia. Estimates in North America vary with as many as 4 in 10 people evaluated for personal injury or compensation cases suspected of exaggerating symptoms. Data on Australian neuropsychology symptom exaggeration base rates were estimated using a modified and expanded version of a survey previously designed for this purpose (Mittenberg, Patton, Canyock, & Condit, 2002). Figures were based on an estimated 1818 annual cases involved in personal injury, ( $n = 542$ ), disability ( $n = 109$ ), criminal ( $n = 108$ ), or medical ( $n = 1059$ ) matters. Symptom exaggeration base rates associated with referral type and diagnoses were variable. Specifically, 17% of criminal, 13% of personal injury, 13% of disability or workers compensation, and 4% of medical or psychiatric cases were reported to involve symptom exaggeration or probable symptom exaggeration. The highest rates of symptom exaggeration included cases referred for mild head injury (23%), pain or somatoform disorders (15%), moderate to severe head injury (15%), and fibromyalgia or chronic fatigue (15%). Overall, Australian symptom exaggeration base rates reported in this study were lower compared to base rates previously reported in North America.

Keywords: Clinical neuropsychology, symptom exaggeration, malingering, base rates, response bias

## Symptom exaggeration base rates and detection methods in Australia

For the average clinician, a formal evaluation of symptom exaggeration is not a routine component of a neuropsychological assessment, and is only considered when suspicion is raised during the testing session (Franzen & Iverson, 1998). Although the importance of *routinely* screening for symptom exaggeration in personal injury cases is widely recognised (e.g., Bianchini, Mathias, & Greve, 2001; Doss, Chelune, & Naugle, 1999; Green, Rohling, Lees-Haley, & Allen, 2001; Iverson & Binder, 2000; Iverson & Franzen, 1996; Langeluddecke & Lucas, 2003; Mateer, 2000; Millis, Ross, & Ricker, 1998; Slick, Hopp, Strauss, & Spellacy, 1996; Spreen & Strauss, 1998; Suhr & Boyer, 1999; Sweet, 1999), screening for symptom exaggeration in the absence of litigation is far from routine clinical practice.

An understanding of symptom exaggeration base rates in specific clinical settings is critical for encouraging good assessment practices among clinicians. If the frequency of symptom exaggeration can be determined in clinical settings where symptom exaggeration is not considered a common occurrence (e.g., medical hospital), this may encourage practitioners to *routinely* employ appropriate measures to screen for exaggeration. In clinical settings where symptom exaggeration is more common (e.g., personal injury litigation), the knowledge of symptom exaggeration base rates helps the clinician to (a) determine an appropriate management strategy (by informing decisions about cutoff score for detection tests), and (b) determine how confident clinicians can be that a test result does in fact reflect exaggeration. For example, it is well known that positive predictive power values and other test operating characteristics vary depending on the base rate of symptom exaggeration<sup>1</sup>. For the clinician, the lack of consideration of symptom exaggeration base rates may ultimately lead to the misidentification of individuals attempting to exaggerate or feign impairment.

To date, the majority of research providing symptom exaggeration base rates has focused on individuals assessed in neuropsychological settings throughout North America. Larrabee (2003) examined 11 North American-based empirical studies that included a pooled sample of 1363 consecutive referrals seeking compensation for mild head injury. Based on the pooled sample, the base rate of symptom exaggeration was 40% (range: 15%- 64%). In a recent large scale survey of the American Board of Clinical Neuropsychology membership, Mittenberg et al. (2002) reported estimated base rates from 131 respondents that included 33,531 annual neuropsychological cases involved in personal injury ( $n = 6,371$ ), disability ( $n = 3,688$ ), criminal ( $n = 1,341$ ), and medical ( $n = 22,131$ ) matters. Mittenberg and colleagues found that the average reported base rate of symptom exaggeration was 29% in personal injury, 30% in disability, 19% in criminal, and 8% in medical cases. Symptom exaggeration base rates tended to be higher in some clinical samples than others, with the highest base rates of malingering found in individuals referred for mild head injury (39%), fibromyalgia/chronic fatigue (35%), and chronic pain (31%). Overall, the North American literature suggests that the rate of symptom exaggeration is variable with fluctuations associated with setting, referral type, and diagnosis. Typically estimates of symptom exaggeration in personal injury cases suggest it ranges between 20 to 35% (Mittenberg et al., 2002).

The degree to which Australians presenting for neuropsychological assessment exaggerate their current level of functioning has been examined in a handful of studies only. These studies suggest that the base rate of symptom exaggeration in Australia, based on estimates derived from the Wechsler Memory Scale-III Rarely Missed Index (WMS-III RMI) is lower than reported in North America. Reported base rates of symptom exaggeration range from 12.7% in a sample of 158 personal injury litigants (Lange, Anderson, & Sullivan, in press)<sup>2</sup> to 28% in 99 mild head injury litigants (Langeluddecke & Lucas, 2004). *However, these base rates may not accurately reflect the true rate of malingering in these samples*

*because these base rates were derived from the performance on a single validity test only (e.g., TOMM or WMRT).* Information regarding base rates in Australia is extremely limited and requires *further* systematic examination. The purpose of this study was to replicate and expand Mittenberg et al.'s symptom exaggeration base rate study in Australia. There were three primary aims. First, to establish the base rate of symptom exaggeration in Australia. Second, to compare the base rates from Australia to those reported in North America. Third, to determine what methods of symptom exaggeration detection are commonly used by Australian clinicians.

## Method

### *Measures*

Measures included a modified and expanded version of Mittenberg and colleagues "Survey on Probable Malingering and Symptom Exaggeration" (Mittenberg et al., 2002). The original survey was modified for use in Australia by (a) substituting Australian states for North American geographical regions, and (b) relabelling clinical practice settings using local terminology. The original survey was expanded in five ways. First, two questions were included aimed at gathering information regarding the methods and specific tests used by clinicians to screen for symptom exaggeration. Second, one question was included regarding membership to national and international professional organisations. Third, participants were instructed to complete the survey using a database rather than by using a "best guess". An item was also included for participants to indicate whether they had completed the survey by consulting a data base or using a "best guess" method. Fourth, an item was included to assess the extent of screening for symptom exaggeration routinely undertaken with litigating and non-litigating clients. Finally, a "minimal response option" was included on the survey requesting details of practice characteristics and reasons for not completing the full survey to

enable comparisons between those who completed the full survey and those who did not. The survey used in this study is presented in the Appendix.

*Procedure*

Two recruitment strategies were adopted for data collection (a) emailing members ( $n = 250$ , including 170 full members) of the Australian Psychological Society [APS], College of Clinical Neuropsychology [CCN], and (b) inviting delegates from two neuropsychology conferences to participate. Conferences included the Australasian Society for the Study of Brain Injury (ASSBI)/International Neuropsychological Society (INS) conference [July, 2004], and the APS, CCN annual conference [November, 2004]. Survey promotion strategies used at these conferences included: periodic announcements about the survey during sessions, advertisements on the conference noticeboard, staffing the survey return/distribution area (INS only), and placing flyers on delegates seats and satchels (CCN only).

A total of 17 surveys were returned by participants. Four responses were received after the ASSBI/INS conference, nine responses following distribution via the CCN email list, and the remaining four responses after the CCN conference. One participant could not estimate base rates because they felt their practice did not involve a significant number of litigating or compensation seeking clients (minimal response option completed only). Data from two participants had to be excluded because of inconsistencies. For example, these participants reported they did not see criminal cases, but provided estimates of probable symptom exaggeration for such cases. Thus, prevalence estimates were based on 14 surveys. Comparisons between minimal responders ( $n = 1$ ) and others who completed the entire survey could not be undertaken.

Prevalence estimates were calculated using the method employed by Mittenberg et al. (2002). Annual figures were derived by multiplying by 12 the number of respondents by the mean number of assessment types per month (e.g., criminal, medical and so on). Prevalence estimates were therefore based on an estimated 1818 annual cases<sup>3</sup> involved in personal injury, ( $n = 542$ ), disability ( $n = 109$ ), criminal ( $n = 108$ ), or medical ( $n = 1059$ ) issues. Only



three participants supplied information directly from a database; most participants ( $n = 11$ ) provided their best estimate of practice statistics.

## Results

Demographic characteristics of the survey respondents are presented in Table 1. Relatively few APS CCN members participated in this study, however the geographic distribution of those who did participate did not differ significantly from that of the APS CCN membership ( $\chi^2 [3, 12] = 2.434, p > .05$ ). Respondents had been practicing neuropsychology for an average of 13.6 years ( $SD = 8.7$ ), and interpreted an average of 10.8 ( $SD = 6.2$ ) examinations per month. The majority of the participants were from New South Wales and Victoria (72% combined). Approximately two thirds of the sample (64%) was in private practice. Most of the assessments conducted by participants (almost 60%) did not involve clients seeking financial gain. Similar figures were obtained by Mittenberg et al. (2002) who reported approximately 50% of respondents involved in private practice and 60% of cases involved non-litigating psychiatric or medical evaluations. Of those cases involved in personal injury or disability claims (approximately 30%), 73% of cases were referred by a plaintiff physician or attorney versus 24% referred by a defendant attorney or insurer.

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Insert Table 1 about here

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The percentage of annual cases identified as probable symptom exaggerators by practice setting and by referral type is presented in Table 2. Estimated symptom exaggeration base rates ranged from 3.5% to 17% depending on referral type. The highest base rate was reported for criminal cases (17%), followed by personal injury and disability cases (both 13%), and medical or psychiatric cases (3%). Across practice setting, base rates ranged from 3% to 17%. The highest estimated base rate was reported in criminal cases seen in private

practice (19%) followed by civil cases (13%) seen in a private or group practice. The lowest estimated base rates were reported for medical or psychiatric cases not involved in litigation or compensation in both private (4%) and hospital (3%) settings

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Insert Table 2 about here

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Symptom exaggeration base rate information by diagnostic category is presented in Table 3. Using the percentage of reported diagnoses associated with symptom exaggeration, a rank was assigned to each diagnosis type. Ranks were obtained in a way similar to Mittenberg et al. (2002) to show the frequency of endorsement of diagnostic categories identified in that study. For comparative purposes, the ranked position for each diagnosis presented by Mittenberg and colleagues is also included. The highest rates of symptom exaggeration included cases referred for mild head injury (23%), followed by pain or somatoform disorders, moderate to severe head injury, and fibromyalgia or chronic fatigue (15% in each of these cases). The lowest base rates were found in cases involving vascular dementia (8%) and seizure disorders (9%). These rankings were generally similar to those reported by Mittenberg et al., with the exception of the moderate to severe head injury cases (ranked third in this study and tenth by Mittenberg et al., 2002).

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Insert Table 3 about here

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The percentage of respondents who endorsed using various indicators to support the detection of symptom exaggeration is presented in Table 4. Respondents reported using a range of potential markers to screen for symptom exaggeration. Ranks of the importance of indicators for this study and that of Mittenberg et al. (2002) are also provided for comparison.

Specifically, the average respondent considered 6.6 (SD = 1.7) out of nine possible indicators of symptom exaggeration when forming an opinion about symptom exaggeration. The most frequently endorsed indicator considered by respondents was the severity of cognitive impairment inconsistent with the condition (68%), the pattern of cognitive test performance inconsistent with the condition (66%), discrepancies among records, self-report, and observed behaviour (64%), and the use of forced choice measures using scores below empirical cutoffs (59%). The least frequently endorsed methods were: use of validity scale cutoffs on objective personality tests (24%); scores below chance on forced choice tests (32%); and, scores below empirical cutoffs on other symptom exaggeration tests (30%). The ranking for these measures was again generally commensurate with those reported by Mittenberg et al. (2002).

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Insert Table 4 about here

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The percentage of respondents who endorsed using specific symptom exaggeration tests and indices derived from standard neuropsychological tests is presented in Table 5. The two most frequently used tests of symptom exaggeration were the Rey 15-item (See Spreen & Strauss, 1998; 46%) and the Test of Memory Malingering (Tombaugh, 1996; 41%). The most frequently used symptom exaggeration indices derived from standard neuropsychological tests (i.e., in-test methods) were recognition scores from the Rey Auditory Verbal Learning Test (Rey, 1964; 24%), the Rarely Missed Index derived from Logical Memory Recognition subtests of the Wechsler Memory Scale-Third Edition (WMS-III; Psychological Corporation, 1997; 15%), and discrepancy scores between attention and memory indexes on the Wechsler Memory Scales (14%). Twenty-two percent of the sample endorsed using other symptom exaggeration tests not included on the survey. Specifically, each of the following tests was endorsed by at least one participant: (a) Hopkins Verbal Learning Test forced choice

recognition data [Brandt, 1991], (b) Rawlings Simulation Index (Rawlings & Brooks, 1990), and (c) Portland Digit Recognition Test [Binder, 1990]. Two participants reported using either their own “validated” test or a structured interview, though these remained unspecified. Use of in-test methods used to detect symptom exaggeration not otherwise listed in Table 6 were also reported by a small number of participants ( $n = 4$ ). These were the (a) “general pattern of performance and WMS-III RS and list recognition”, (b) SCL-90-R, and (c) “Auditory recognition II raw score  $< 43$ .” Of the 14 respondents, 84.6% *routinely* screen for symptom exaggeration in litigation/compensation cases, while 38.5% *routinely* screen for cases that do *not* involve in litigation/compensation.

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Insert Table 5 about here

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## Discussion

Comparison of the base rates of symptom exaggeration in personal injury cases reported in this study (i.e., 13%), reveal that these results are consistent with symptom exaggeration base rates reported in only one of the two previously published symptom exaggeration studies using personal injury cases in Australia (12.7%; Lange et al., in press). Base rates of symptom exaggeration reported by Langeluddecke and Lucas, 2003 (i.e., 29%) were substantially higher compared to these results. It is not clear why the results of Langeluddecke and Lucas are higher than other Australian base rate estimates. Both previous studies were based on data from one or two practices only and were similar to each other in this regard. Both used consecutive case methods to determine study entry, and although both previous studies were conducted in different States, regional differences in base rates were not found in this study. It is possible that the discrepancy between these two studies is a consequence of the difference in head injury severity of the two samples. Lange et al.

examined participants with head injury severity ranging from mild to severe, while Langeluddecke and Lucas examined participants with mild head injury only. In this regard, when base rates are compared to specific diagnostic groups, the 29% base rate reported by Langeluddecke and Lucas in their sample of mild head injury litigants is actually commensurate to base rates found in this study for the same patient population (i.e., 23%).

Compared to malingering base rates reported in North America, the results of this study suggest that symptom exaggeration base rates in personal injury and other case types may be lower in Australia compared to similar North American settings, although associated trends may be similar. For example, the three diagnoses most frequently associated with symptom exaggeration in the study by Mittenberg et al., (2002) were the same as those reported in this study (i.e., head injury, fibromyalgia/CFS, and pain or somatoform disorders). In addition, use of multiple symptom exaggeration indices was reported in both studies and diagnostic impressions were supported in 50% or more of symptom exaggeration cases by similar indicators (namely, the level and pattern of performance relative to presenting condition, scores below cut-offs on forced choice tests, and discrepancies across data sources). This suggests that the general approach to symptom exaggeration detection adopted by Australian and North American neuropsychologists is similar, and that there are similarities in the presenting diagnoses of probable malingerers in both countries.

Despite similarities in trends associated with this data, it is important to consider why the symptom exaggeration base rates might be lower in Australia than in North America. A possible explanation for this discrepancy is the difference between the Australian and North American personal injury litigation systems. For example, in Australia the loser of such litigation usually pays the expenses of both sides (whereas in North America the plaintiff pays no legal expenses if no settlement is awarded). In addition, in Australia settlement amounts may be limited by law with the effect that the maximum amount payable in the United States

is likely to be substantially higher than it is in Australia. These differences in the potential monetary rewards and costs associated with malingering may at least partly account for differential rates of malingering in these two countries.

A second reason that could account for the lower rate of reported symptom exaggeration in our study compared to Mittenberg's relates to the source of referrals (Mittenberg et al., 2002). Specifically, Mittenberg et al. showed a significant negative association between the proportion of plaintiff referrals and malingering base rates. The more plaintiff cases seen, the lower the estimate of malingering reported. In our study, most referrals were from plaintiffs (77%) and this could explain why the malingering base rate in our study was lower than that reported in the previous North American study.

The base rate of symptom exaggeration in general medical settings also deserves comment. Whilst the base rate of symptom exaggeration in Australian medical settings (3 to 4%) was lower than reported previously in North America (8%; Mittenberg et al., 2002), this represents a reasonable proportion of cases. That is, between 1 in 25 and 1 in 30 persons seen for medical or psychiatric assessments may be exaggerating symptoms depending on the setting (i.e., private/group practice versus hospital). Further, whilst the percentage of practitioners reporting the use of symptom exaggeration detection tasks with non-litigating clients was relatively high in this study (approximately 40%), this level was about half that for litigating clients. There may be a need for increased screening for symptom exaggeration in non-litigating groups and this study provides an indication of diagnostic categories where such screening may be particularly important.

In terms of methods used to detect malingerers, the Test of Memory Malingering (TOMM) and Rey 15-item test appear to be the most frequently used test by Australian neuropsychologists to screen for symptom exaggeration. Whilst the TOMM is generally regarded as a useful measure for this purpose (e.g., Powell, Gfeller, Hendricks, & Sharland,

2004; Ashendorf, Constantinou, & McCaffrey, 2004; Hill, Ryan, Kennedy, & Malamut, 2003; Rees, Tombaugh, & Boulay, 2001; Rees, Tombaugh, Gansler, & Moczynski, 1998; Tombaugh, 1997; Tan, Slick, Strauss, & Hultsch, 2002; van Hout, Schmand, Wekking, Hageman, & Deelman, 2003), the Rey 15-item test has been widely criticized and is generally not recommended (e.g., Griffen, Glassmire, Henderson, & McCann, 1997; Millis & Kler, 1995; Rogers, Harrell, & Liff, 1993; Schretlen, Brandt, & Krafft, 1991; Vickery, Berry, Inman, Harris, & Orey, 2001). The preference for using the Rey-15 item test to screen for response bias is of concern, and may have artificially inflated the estimates of malingering recorded in this study.

Use of “in-test” symptom exaggeration detection methods (i.e., methods derived from standard clinical tests) was also reported by participants in this sample, and the most frequently endorsed method was the RAVLT recognition score (24%). Of particular interest was the frequency of respondents who endorsed using methods that include the Digit Span subtest (Reliable Digits = < 1%; Vocab-Digit Span discrepancy scores = 7%) and the Rarely Missed Index (RMI; 15%) to detect exaggeration. The frequency of using Digit Span methods was surprisingly low considering the large body of research suggesting that low digit span performance is associated with poor effort (e.g., Axelrod & Rawlings, 1999; Bernard, 1990; Binder & Willis, 1991; Greiffenstein, Baker, & Gola, 1994; Greve, Bianchini, Mathias, Houston, & Crouch, 2003; Iverson & Franzen, 1994, 1996; Iverson & Tulsky, 2003; Meyers, Galinsky, & Volbrecht, 1999; Meyers & Volbrecht, 1999; Millis et al., 1998; Mittenberg, Theroux-Fichera, Zielinski, & Heilbronner, 1995; Suhr, Tranel, Wefel, & Barrash, 1997; Trueblood, 1994; Trueblood & Schmidt, 1993). On the other hand, the frequency of using the RMI was much higher than expected considering the limited number of studies that have examined the use of this measure as a tool for assessing response style. Of the limited research available to date since the initial development of the RMI by Killgore & DellaPietra

(2000), initial findings have not supported the RMI as a reliable indicator of detecting suspected exaggerators (Lange et al., in press; Lange et al., 2003; Langeluddecke & Lucas, 2004).

There are several limitations of this study. One limitation is the small number of surveys returned. Only 17 people responded to the survey despite others being presented with three opportunities to do so. It is difficult to explain why the completion rate for this survey was low. One possibility is that the subject of symptom exaggeration is regarded by Australian neuropsychologists as only relevant to those working predominantly with medico-legal cases. Since this is not the case for most Australian neuropsychologists, many clinicians may have perceived the survey as not relevant to them. Data from the minimal response section of this survey could not be used to shed light on the reasons for the low response rate because this section was typically not completed. In addition, because of the sampling method used in this study, it was not possible to calculate the response rate for this survey. Thus, it is difficult to comment on the representativeness of these results, beyond noting they appear to offer reasonable a geographical match with the distribution of APS, CCN members. Findings from this study should be interpreted as providing a general indication of practice trends only because of the use of a convenience sample. Future investigations should explore ways of improving survey participation. This could include the use of focus groups (as an alternative to surveying participants), conducting an exit poll of those who complete the survey to determine if there were particular reasons for participating (e.g., perceptions that the survey was particularly relevant), or the provision of incentives for participation, such as professional development points.

A second limitation of this study relates to the quality of the information obtained from respondents. The majority of respondents provided estimates of base rates rather than consulting data bases. Although similar published studies share this limitation (e.g.,



Mittenberg et al., 2002), we attempted to improve data quality by encouraging respondents to refer to data bases when completing this survey. Since relatively few participants did this, future studies may need to explore why data bases were not consulted by more people. Alternatively, a prospective study may be needed so that base rates can be recorded as cases are processed avoiding the need to rely on best guesses, or a comparison of “estimated” and data base generated figures could be undertaken to determine the reliability of professionals’ opinions about malingering frequency.

Despite these limitations, three strengths of this study should not be overlooked. First, until recently, symptom exaggeration base rates in Australia could only be derived from a handful of published studies on symptom exaggeration (e.g., Lange et al., in press; Langeluddecke & Lucas, 2004). This study presents base rate data from 14 different settings, across four Australian States, over a much larger number of cases than was previously the case. Second, to our knowledge, this is the first study in Australia that reports symptom exaggeration test usage. Such information is important as it can inform professional development programs designed to ensure best practice in relation to the use of symptom exaggeration detection tasks. Third, this study clearly shows the extent of symptom exaggeration may vary internationally, even though there appears to be similarities in terms of patterns of symptom exaggeration related to diagnostic categories and setting. This suggests caution is needed when generalising North American symptom exaggeration base rates to Australia and possibly elsewhere.

Overall, the importance of this study is reflected in the relationship between symptom exaggeration base rates and diagnostic accuracy. Without such information, diagnostic accuracy may be reduced. Future studies of this type will be needed to ensure the currency of symptom exaggeration base rates across various setting types, geographic regions, and diagnostic categories.

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This project was approved by the Queensland University of Technology (QUT) Human Research Ethics Committee and funded by a School Research Grant awarded to Drs. Karen Sullivan and Rael T. Lange by the School of Psychology and Counselling Research and Postgraduate Committee, QUT.

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We would like to thank members of the Australian Psychological Society (APS), College of Clinical Neuropsychology (CCN) who kindly agreed to take part in this study, and those that helped facilitate data collection for this project. In particular, the contributions of the following people are recognized: Debbie Anderson (Chair, APS CCN National Executive), Dr Wayne Reid (CCN 2004 Conference organising committee), and Dr Nancy Pachana and Associate Professor Skye MacDonald (Australasian Society for the Study of Brain Injury [ASSBI]/International Neuropsychological Society [INS], July 2004 conference organising committee). We would also like to thank Rebecca Sullivan and Kate Mulgrew for assisting with the preparation of this manuscript.



Selected results from this paper were presented at the Annual Conference of the Australian Psychological Society, College of Clinical Neuropsychology Conference, held in Melbourne Australia, October, 2005.

#### Footnotes

<sup>1</sup> As the base rate of malingering increases, so does the positive predictive power. Conversely, as malingering base rates decrease, so positive predictive power values decrease.

<sup>2</sup> In a conference presentation at the National Academy of Neuropsychology, Lange, Senior, Douglas, & Dawes (2003) reported a 14.1% base rate of Malingered Neurocognitive Dysfunction (Slick, Sherman, & Iverson, 1999) in a sample of 64 head injury litigants of mixed severity. This sample was not the same sample as used by Lange et al. (in press).

<sup>3</sup> Two participants submitted case type estimates that did not sum to 100%. Estimates were adjusted by 2.5% in both cases (i.e., added in one case and subtracted in the other case).



Table 1

*Demographic characteristics of survey respondents (N = 14)*

Region of Practice <sup>a</sup>	%
New South Wales	36
Victoria	36
Queensland	14
South Australia	14
Practice Setting <sup>b</sup>	
Private practice	64
Hospital	36
Percentage of annual referrals	
Personal injury litigation	30
Disability or worker's compensation claims	6
Criminal litigation	6
Medical or psychiatric not involving litigation	60
Percentage of Personal injury or Disability Cases	
Referred by plaintiff's doctor or attorney	73
Referred by defendants attorney or insurer	24
Self-referred	4
Percentage of criminal cases	
Referred by defence attorney	60
Referred by prosecuting attorney	40

*Note.* <sup>a</sup>No data were received from participants in Western Australia, Northern Territory, Australian Capital Territory, or Tasmania. <sup>b</sup>No cases from University affiliated hospitals or clinics were reported.

Table 2

*Estimated base rates of probable malingering or symptom exaggeration by referral type and practice setting*

Setting	M (%)	SD (%)
Civil Cases		
Private or group practice	13	13
Hospital (public or private)	9	10
Criminal cases		
Private or group practice	19	24
Hospital (public or private) <sup>a</sup>	-	-
Medical or psychiatric cases not involving litigation or compensation		
Private or group practice	4	6
Hospital (public or private)	3	2
<hr/>		
Referral Type		
Personal injury cases	13	12
Disability or worker's compensation	13	13
Criminal	17	22
Medical or psychiatric cases	3	5

*Note.* <sup>a</sup>A five percent estimate of malingering in annual cases seen in hospital settings involving criminal cases was reported by one participant.

Table 3

*Base rates of probable malingering or symptom exaggeration in litigating or compensation seeking cases by diagnosis*

Diagnosis	M (%)	SD (%)	Ranked position	
			This study	Mittenberg et al. (2002)
Mild head injury	23	27	1	1
Pain or somatoform disorders	15	27	2	3
Moderate or severe head injury	15	27	3	10
Fibromyalgia or chronic fatigue	15	29	4	2
Depressive disorders	11	27	5	6
Neurotoxic disorders	11	27	6	4
Anxiety disorders	11	27	7	7
Electrical injury	10	27	8	5
Dissociative disorders	10	28	9	8
Seizure disorders	9	27	10	9
Vascular dementia	8	27	11	11

Table 4

*Percentage of diagnostic impressions supported by criteria in probable malingering or symptom exaggeration cases in order from highest to lowest*

Criteria	Ranked position		
	%	This study	Mittenberg et al. (2002)
Severity of cognitive impairment inconsistent with condition	68	1	1
Pattern of cognitive test performance inconsistent with condition	66	2	2
Discrepancies among records, self-report, and observed behaviour	64	3	4
Scores below empirical cutoffs on forced choice tests	59	4	3
Implausible self-reported symptoms in interview	56	5	5
Implausible changes in test scores across repeated examinations	44	6	7
Scores below chance on forced choice tests	32	7	9
Scores below empirical cutoffs on other malingering tests	30	8	6
Scores above validity scale cutoffs on objective personality tests	24	9	8

Table 5

*Use of specialised malingering tests and methods to detect malingering derived from standard neuropsychological tests*

Specialised malingering tests	%
Rey 15-item test	46
TOMM	41
Warrington recognition memory test	22
Other*	20
Work memory test	14
Validity indicator profile	2
Victoria symptom validity test	<1
21-item test	0
<hr/>	
Malingering detection tools derived from standard neuropsychological tests	
RAVLT recognition scores	24
Other <sup>a</sup>	22
WMS-III RMI	15
WMS-R/III attention–memory discrepancy scores	14
WAIS-R/III Digit span/ Vocabulary difference score	7
WCST Unique items	7
CVLT recognition scores	2
WAIS-R/III Reliable digits	<1
RCFT Recognition trial	0

*Note.* <sup>a</sup>Examples provided in text.

## Appendix

**SECTION A: General Referral Information**

1. In which region do you practice?
 

<input type="checkbox"/> Western Australia	<input type="checkbox"/> South Australia	<input type="checkbox"/> Victoria
<input type="checkbox"/> New South Wales	<input type="checkbox"/> Queensland	<input type="checkbox"/> Tasmania
<input type="checkbox"/> Northern Territory	<input type="checkbox"/> Australian Capital Territory	
  
2. Indicate one primary practice setting
 

<input type="checkbox"/> Private practice	<input type="checkbox"/> Public or private hospital
<input type="checkbox"/> University	
<input type="checkbox"/> Other (please specify) _____	
  
3. Do you currently practice clinical neuropsychology in Australia?  Yes  No
  
4. Which professional organisations are you a member of (tick all that apply)?
 

<input type="checkbox"/> Australian Psychological Society, College of Clinical Neuropsychology (APS, CCN)
<input type="checkbox"/> Australian Psychological Society, College of Forensic Psychologists
<input type="checkbox"/> Australian Society for the Study of Brain Impairment (ASSBI)
<input type="checkbox"/> International Neuropsychology Society (INS)
<input type="checkbox"/> National Academy of Neuropsychology (NAN)
<input type="checkbox"/> Other (please specify) _____
  
5. \_\_\_\_\_ Years of clinical neuropsychology practice
  
6. \_\_\_\_\_ Number of neuropsychological examinations interpreted monthly
  
7. What percentage of total annual neuropsychological referrals involve the following:
 

_____ % personal injury litigation
_____ % disability or worker's compensation claims
_____ % criminal litigation
_____ % medical or psychiatric not involving or seeking compensation
  
8. What percentage of PERSONAL INJURY OR DISABILITY CASES are referred from the following sources:
 

_____ % referred by treating doctor
_____ % referred by plaintiff's attorney
_____ % referred by defence attorney or insurer
_____ % self referred
  
9. What percentage of CRIMINAL CASES are referred or requested by:
 

_____ % defence
_____ % prosecution

If you are making a **MINIMAL RESPONSE**, please indicate why you have chosen not to complete the full questionnaire, in the space below. **OTHERWISE**, you are ready to commence the ethics part of this survey.

**SECTION B: Malingering Base Rates**



10. What percentage of your annual cases in each category involve PROBABLE SYMPTOM EXAGGERATION OR MALINGERING?
- \_\_\_\_\_ % of personal injury cases
- \_\_\_\_\_ % of disability or worker's compensation cases
- \_\_\_\_\_ % of criminal cases
- \_\_\_\_\_ % of medical or psychiatric cases not involved in litigation or seeking compensation
11. What percentage of your LITIGATING OR COMPENSATION SEEKING CASES examined for the following disorders involve probable symptom exaggeration or malingering?
- \_\_\_\_\_ % of mild head injury claims
- \_\_\_\_\_ % of moderate or severe head injury claims
- \_\_\_\_\_ % of depressive disorder claims
- \_\_\_\_\_ % of anxiety disorder claims
- \_\_\_\_\_ % of pain or somatoform disorder claims
- \_\_\_\_\_ % of dissociative disorder claims
- \_\_\_\_\_ % of vascular dementia claims
- \_\_\_\_\_ % of seizure disorder claims
- \_\_\_\_\_ % of neurotoxic disorder claims
- \_\_\_\_\_ % of electrical injury claims
- \_\_\_\_\_ % of fibromyalgia or chronic fatigue claims
12. In what percentage of your PROBABLE SYMPTOM EXAGGERATION OR MALINGERING CASES do each of the following support your impression?
- \_\_\_\_\_ % below empirical cut-off on forced choice tests
- \_\_\_\_\_ % below chance on forced choice tests
- \_\_\_\_\_ % below empirical cut-off on other malingering tests
- \_\_\_\_\_ % pattern of cognitive test performance does not make neuropsychological sense (inconsistent with condition)
- \_\_\_\_\_ % severity of cognitive impairment inconsistent with condition
- \_\_\_\_\_ % implausible changes in test scores repeated examinations
- \_\_\_\_\_ % above validity scale cut-offs on objective personality tests
- \_\_\_\_\_ % discrepancies among records, self-report, and observed behaviour
- \_\_\_\_\_ % implausible self-reported symptoms in interview

**SECTION C: Malingering Test Usage**

13. When assessing a case for litigation/workers compensation purposes, do you routinely assess for exaggeration and malingering? (please circle)
- YES                      NO
14. When assessing a case that DOES NOT involve litigation/workers compensation, do you routinely assess for exaggeration and malingering? (please circle)
- YES                      NO

15. What methods do you use to assess for exaggeration and malingering?  
(Please number in order of importance starting with 1 for those methods that you routinely use).
- Tests specifically designed for detecting malingering (e.g., TOMM, Rey 15 Item)
  - Measures/scores obtained from the administration of standard cognitive tests (e.g., WMS-III Rarely Missed Index, WAIS-III Reliable Digits, RAVLT Recognition)
  - Behavioural observation/Interview
16. Which tests designed to detect malingering do you routinely use for assessing exaggeration and malingering? Please indicate the percentage of cases you would use the test.
- \_\_\_\_\_ % Test of Memory Malingering (TOMM)
- \_\_\_\_\_ % Rey 15 Item Test (Rey-15)
- \_\_\_\_\_ % 21-item test (21-Item)
- \_\_\_\_\_ % Validity Indicator Profile (VIP)
- \_\_\_\_\_ % Work Memory Test (WMT)
- \_\_\_\_\_ % Warrington's Recognition Memory Test (WRMT)
- \_\_\_\_\_ % Victoria symptom Validity Test (VSVT)
- \_\_\_\_\_ % other (please indicate) \_\_\_\_\_
17. Do you routinely use any of the following proposed malingering measures/indexes derived from the administration of standard cognitive tests? If so, please indicate the percentage of cases you would use the measure.
- \_\_\_\_\_ % WMS-III Rarely Missed Index (RMI)
- \_\_\_\_\_ % WAIS-III/WAIS-R: Reliable Digits
- \_\_\_\_\_ % WAIS-III/WAIS-R: Difference scores between Digit Span and Vocabulary
- \_\_\_\_\_ % WMS/WAIS: Suppressed attention versus memory discrepancy scores
- \_\_\_\_\_ % Rey Auditory Verbal Learning Test (RAVLT) Recognition scores
- \_\_\_\_\_ % California Verbal Learning Test (CVLT) Recognition scores
- \_\_\_\_\_ % Wisconsin Card Sort Test (WCST) Unique Items
- \_\_\_\_\_ % Rey Complex Figure Test (RCFT) Recognition trial
- \_\_\_\_\_ % other (please indicate) \_\_\_\_\_

Please indicate whether the percentages you indicated in this survey were provided based on (a) a statistical analysis of a database you maintain in your setting, or (b) your best estimate (please tick appropriate box).

- |                                      |                                   |  |
|--------------------------------------|-----------------------------------|--|
| PART A: General Referral Information | <input type="checkbox"/> Database | <input type="checkbox"/> Best estimate |
| PART B: Malingering Base Rates       | <input type="checkbox"/> Database | <input type="checkbox"/> Best estimate |
| PART C: Malingering Test Usage       | <input type="checkbox"/> Database | <input type="checkbox"/> Best estimate |