Pergamon

Archives of Clinical Neuropsychology 18 (2003) 121–134

Archives of CLINICAL NEUROPSYCHOLOGY

Detecting neuropsychological malingering: effects of coaching and information

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Accepted 15 October 2001

Abstract

Concerns that patients presenting for neuropsychological assessment may not be putting forth maximum effort during testing has prompted the development of measures designed to detect malingering and incomplete effort. Two of these measures are the Computerized Assessment of Response Bias-97 (CARB-97) and Word Memory Test (WMT). Despite widespread use of these instruments, no study has been published determining the vulnerability of neuropsychological malingering measures to explicit coaching or brain injury information. The present study, using analog participants, found that the CARB-97 and WMT differentiate "normal" from "malingered" instructional sets, and show little difference between naïve and coached malingering efforts. There was also little difference between providing brain injury information and a no-information condition, but when effects were present, the information group generally scored worse. Further, it was found that response times (RTs), in addition to items correct, may also be effective in detecting those who are not giving their full effort.

Keywords: Malingering; Neuropsychological assessment; Memory impairment

1. Introduction

Clinical neuropsychological assessment is commonly performed following brain injury or other neurological insult. Accurate assessment, however, is dependent upon the patient putting forth his or her best possible effort (Bernard, 1990). It is, therefore, startling to learn that an

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0887-6177/01/$ – see front matter © 2001 National Academy of Neuropsychology.
PII: S0887-6177(01)00188-3

estimated 70% or more of patients assessed by a clinical neuropsychologist in a forensic context are thought to alter their presentations (Heilbrun, Bennett, White, & Kelly, 1990). Youngjohn, Burrows, and Erdal (1995) speculates that almost half of all workers' compensation claims may involve faked cognitive deficits.

With such seemingly high base rates, clinicians must routinely consider that patients may not be completely honest about their condition, or may not be putting forth their best possible effort during testing. There are several commercially available instruments that have been designed specifically to evaluate the effort put forth during neuropsychological testing and to assess dissimulation. Although many of these instruments are generally thought to identify incomplete effort or malingering with at least partial success, new concerns are arising in the literature. Some patients may have access to information about how to exaggerate symptoms in a believable way or, worse, some are being deliberately coached about how to defeat malingering measures. Concerns have been raised that patients may be going to great lengths to defeat malingering measures on the advice of unethical attorneys (Lees-Haley, 1997). Youngjohn (1995) confirms the instance of an attorney coaching a client prior to neuropsychological testing and providing him with literature regarding malingering measures and simulating injury. If malingerers are able to perform convincingly on these measures, then truly accurate neuropsychological assessment becomes very difficult. It is important, therefore, to understand the impact on malingering measures of receiving coaching as to how to perform on certain tests convincingly or receiving information about the behavioral effects of brain injury.

A limited number of studies have examined either the effects of coaching analog participants (normal participants instructed to pretend that they are malingering) to defeat malingering measures or providing information about the cognitive sequelae of brain injury. Only two studies have explicitly examined the effects of coaching participants to defeat malingering measures (although Hiscock & Hiscock, 1994, did include a coached malingering group in research on cutoff scores for a forced-choice measure). Rose, Hall, Szalda-Petreem, and Bach (1998) found that performance on some malingering measures (Nonverbal Forced-Choice Test, 21-Item Test, and Dot-Counting Test) was susceptible to coaching, while performance on a novel computerized version of the Portland Digit Recognition Test (PDRT) was resilient to such preparation. Similarly, a study by Martin, Bolter, Todd, Gouvier, and Niccolls (1993) reported that a coached group of analog participants scored at chance levels on a computerized forced-choice measure, whereas uncoached analog participants asked to malinger scored well below chance. Scoring at levels below chance strongly indicates malingering and, therefore, the coached participants had a more believable (albeit still borderline) profile. Both of these studies, however, used computerized measures specifically constructed for use in their experiments (although based on more widely known and used measures) that are not widely used in clinical practice. It should also be noted these studies do illustrate the benefit of using computer-presented instruments, as they record response time (RT), which can be used as an additional measure of effort (with more variable and longer RTs being associated with malingering).

Additionally, Suhr and Gunstad (2000) tested analog participants on a variety of neuropsychological measures, including the expanded Auditory Verbal Learning Test and the Warrington Memory Test (WMT) and a forced-choice malingering measure, the PDRT. While they describe a "coached" condition, this experimental group was not given explicit coaching to defeat methods to detect malingering. Rather, this group was given a nonspecific warning that their efforts to feign impairment may be susceptible to detection. They found that the PDRT was not as sensitive to feigning when participants were given a warning about being detected.

There are also several published studies on the effects of coaching on standardized neuropsychological instruments that were not designed explicitly to detect symptom exaggeration, although there is evidence that they are often sensitive to malingering. Rapport, Farchione, Coleman, and Axelrod (1998) used motor function tests (Grip Strength, Grooved Pegs, and Finger-Tapping Test) to compare control, naïve, and coached malingerers in an analog study. Although their two malingering groups performed more poorly than the control group, the naïve and coached malingering groups did not differ from each other. Coleman, Rapport, Millis, Ricker, and Farchione (1998) found the California Verbal Learning Test (CVLT) was less sensitive to incomplete effort when simulated malingerers were given coaching instructions. DiCarlo, Gfeller, and Oliveri (2000) gave explicit instructions to avoid detection when analog participants were asked to feign cognitive impairment on the Category Test. They also found that specific instructions to avoid detection resulted in significantly more participants being classified as nonsimulators than expected.

Even fewer studies have examined the effects on malingering measures of providing specific information about the behavioral effects of brain injury. Schwartz, Gramling, Kerr, and Morin (1998) provided detailed information about the psychological and neuropsychological sequelae of head injury to analog participants who were compared to actual TBI patients on memory and intelligence tests. They found that such information does not allow analog participants to perform in a manner similar to a TBI comparison group. That is, the authors were still able to discriminate between the TBI patients and the experimental participants based on their neuropsychological performance. This paper also reported that physicians did not differ from lawyers when producing a faked neuropsychological profile after receiving information about brain injury, suggesting that educated professionals without a medical background can produce faked deficits on neuropsychological instruments that are similar to those generated by physicians.

While the Suhr and Gunstad (2000) study did include providing brain injury information to their participants, they found that it had no effect. Only one study has directly examined the effects of both providing brain injury information to analog malingerers and explicitly coaching them about how the instrument detects people feigning impairment. Lamb, Berry, Wetter, and Baer (1994) used analog participants to test the effects of giving brain injury information and/or coaching on the likelihood of obtaining a "fake-bad" profile on the MMPI-2. They found that the MMPI-2 profile is susceptible to the effects of both coaching and brain injury information, in that participants had elevated clinical scales as would be expected in people suffering a closed head injury, while producing validity profiles that did not indicate marked symptom exaggeration.

To our knowledge, there are no published reports of studies that have explicitly examined the effect of brain injury information on performance on neuropsychological malingering measures. Further, those studies that have examined the effects of coaching participants to produce more believable results on psychological and neuropsychological tests have limitations in terms of their generalizability to clinical applications. Specifically, these experiments used instruments that were either not designed to detect neuropsychological malingering or that were constructed specifically for experimental purposes (and therefore, not mainstream instruments used in clinical practice). Finally, only one study has attempted to look at the possible additive effects of coaching and providing brain injury information, and that study did not focus on neuropsychological test performance. The goals of the present study are to determine the effects of brain injury information and coaching to defeat malingering measures on standardized clinical instruments designed to detect neuropsychological dissimulation or incomplete effort. We hypothesized that participants given coaching about how to defeat malingering measures would produce a more believable profile on malingering tests than would participants who were not coached. Similarly, we expected that participants who were coached to defeat malingering measures and also given information about brain injury would have results that resemble published data for brain injured patients more closely than would control participants not given such preparation.

2. Method

2.1. Participants

One hundred thirty-five students from introductory psychology classes participated and were given course research credit in exchange for serving in the study. Students with a history of neurological problems were asked not to participate. One hundred twenty-five participants (51% female) subsequently completed the testing. The mean age of the participants was 20 years (S.D. = 2.7 years, range = 18–30). Eighty-seven percent described themselves as right-handed, 12% were left-handed, and 1% were ambidextrous. Eighty-four percent indicated their race as Caucasian, 12% as African American, less than 1% as Mexican American, Asian American, or Pacific Islander.

2.2. Procedure

Prior to the main study, participants were given the North American Adult Reading Test (NAART), an estimate of intelligence (Blair & Spreen, 1989). Subsequent group assignment was based upon controlling for NAART scores across groups. Additionally, any participant reporting a history of a positive neurological history (e.g., head injury involving loss of consciousness, CVA, seizures) was asked not to participate.

Participants completed two malingering measures. The Word Memory Test (WMT) was administered first (Green, Allen, & Astner, 1997). The WMT is a computer-administered memory task designed to detect malingering and has been described as being a valid indicator of biased responding on neuropsychological tests (Iverson, Green, & Gervais, 1999). The participant sees onscreen instructions explaining that they will be asked to complete a memory test. A 20-item word list is then presented. The words appear in pairs: one word is presented, followed by the next, 1 s later. The pair disappears and another set is presented 2 s later. The list is presented twice and then the participant is asked to recall as many of the word pairs as possible. Four of the six WMT subtests were administered in the present study. The Immediate Recognition subtest requires the participant to identify (recognize) a target word's pair from a distracting word immediately after the word list is presented. The Delayed Recognition is identical to the Immediate Recognition, except that it is given after a 30-min delay. The Multiple

Choice subtest requires the participant to choose a target word's pair from a list of five choices. Finally, the Paired Associates subtest is given, in which the participant is asked to recall a target word's pair. The participant selects the answer by using the computer keyboard. The number of correctly remembered words is reported here in percentages. In addition to percent correct, average RTs were analyzed for the Immediate and Delayed Recognition subtests. The program does not record RTs for the Multiple Choice and Paired Associates subtests.

During the 30-min delay, the Computerized Assessment of Response Bias-97 (CARB-97) was administered (Allen, Conder, Green, & Cox, 1997). A computerized malingering measure, the CARB-97 is modeled after Binder's (1993) PDRT. The participant sits at a computer terminal and is asked to follow the onscreen instructions, which describe the task as a memory test. The participant is presented with a five-digit string of numbers and is asked to remember the string. He or she is next presented with the target number string and a foil in a forced-choice paradigm. The participant must select the item he or she had been presented with earlier, using either the left or right "shift" keys. Following an incorrect response, the incorrect choice is highlighted with a red color and low-pitched buzzing noise is sounded. If a correct response is given, the response is highlighted in a green color and a more pleasant tone is sounded. The CARB-97 includes 75 trials, and the scoring includes the percent of trials correct and time taken to respond to the stimulus items. RT has been identified as being particularly sensitive to possible malingering (Rose, Hall, & Szalda-Petreem, 1995). Therefore, it was desirable to include a measure that also assesses RT.

The CARB-97 has been found to be a reliable method of detecting incomplete effort or dissimulation. Green, Gervais, Astner, Kiss, and Allen (1993) administered an earlier version of the CARB-97 to over 200 patients and found that even people with severe brain injury typically score well above 90%, concluding that this instrument measures effort dedicated to the test independent of other variables, such as IQ, ability, and age. The authors suggest that anyone scoring less than 90% correct may not be putting forth the best effort possible. Certainly anyone scoring at, or below, chance performance (50%) may be exaggerating their symptoms.

Prior to the administration of the malingering measures, participants were randomly assigned to one of five experimental groups, after blocking on NAART score to ensure that the groups would be equivalent in intellectual ability. The experimental conditions are summarized in Table 1.

Six examiners, blind to the participants' group assignment and to the true nature of the experiment, were advanced undergraduate students in psychology. They were given a manual

Table 1
Experimental conditions

Experimental condition	Vignette	Information about brain injury given	Information about how to "defeat" measures given	Instructions to subject
Control group	No	No	No	Perform to best ability
Naïve group	Yes	No	No	Feign head injury
Informed group	Yes	Yes	No	Feign head injury
Coached group	Yes	No	Yes	Feign head injury
Informed and coached group	Yes	Yes	Yes	Feign head injury

about standardized tests. All examiners were trained with pilot participants and were observed closely to be certain they were giving the instruments as per the standardized protocol.

Participants were given the opportunity to ask questions about the instructions. Before the study started, each participant was asked to paraphrase the instructions back to be certain that the directions were clear. Again, participants were warned that they would be working with an examiner who was unaware of the aims of the study. They were cautioned to ask questions about the study only of the experimenter, in order to keep the examiner blind. To help keep participants from inadvertently informing a blind examiner about the true purpose of the study, they were told to ask questions only of staff who wore a white lab coat.

Members of the control group were not given any instructions other than that they were participating in a memory study and should do their best on each of the tasks. Participants in the four malingering groups (all groups other than the control group) were required to read a vignette (see Appendix A) that described the subject as working as a paramedic and being assaulted during an emergency call. The vignette suggested that they were unable to work and were seeking compensation. These participants also were given specific instructions about emulating the main character in the story. They were asked to do their best in pretending that they had a head injury.

The coached group was given a sheet to read regarding methods to defeat malingering measures in a manner that would appear convincing. For example, they were advised to make sure they scored at better than chance levels on the measures, were able to do easy things, and performed consistently across tasks. The informed group read a fact sheet regarding closed head injury, describing common sequelae following head injury (e.g., memory loss, irritability, headaches). The informed and coached group received both the coaching instructions and brain injury information. Participants who did not receive this information were given control information unrelated to brain injury or coaching instructions. This material was roughly the same length and complexity as the experimental material.

At the conclusion of the assessment, a questionnaire designed to quantify how participants were able to comply with the experimental instructions was administered, and the participants were debriefed. The questionnaire included three questions asking how successful the participant was in remembering the experimental instructions, how motivated they were in following the instructions, and how successful they felt in following the instructions. They were asked to make their responses on a five-item Likert scale. In their critique of methodological considerations in malingering research, Rogers, Harrell, and Liff (1993) suggest that a monetary incentive is important when using analog participants. Therefore, a lottery was designed to help motivate participants. While participants were told that their entering this lottery was contingent on the effort they put forth during testing, or their ability to simulate someone who was head injured, all were actually in the lottery for ethical reasons. Following the completion of the study, five participants (one from each experimental group) were identified in a random sampling procedure and were awarded US$100.00.

2.3. Statistical analysis

In order to detect differences among the experimental groups, three sets of analyses were conducted. First the malingering groups were collapsed into a single group (“collapsed

Table 2
Mean (S.D.) raw scores by group

Test	Control	Collapsed malingering	Coached group	Informed group	Coached and informed group	Naïve group
CARB-97						
Percent correct	100	60	75	50	61	53
S.D.	1	22	19	19	23	28
Mean RT (in ms)	1007	2463	2469	2603	2327	2451
S.D.	230	1410	1429	1488	1245	1479
S.D. RT (in ms)	330	1231	1113	1429	1187	1196
S.D.	117	603	558	620	633	599
WMT						
IR						
Percent correct	99	62	77	54	60	56
S.D.	2	21	16	17	25	27
Mean RT (in ms)	1492	2960	2696	3082	3143	2919
S.D.	816	1396	1188	1439	1563	1392
DR						
Percent correct	95	57	73	47	56	51
S.D.	2	22	19	20	23	24
Mean RT (in ms)	1020	2319	2022	2735	2325	2192
S.D.	289	1251	1200	1397	1190	1216
MC						
Percent correct	98	44	60	33	44	38
S.D.	4	25	26	21	25	27
PA						
Percent correct	99	49	66	40	50	40
S.D.	1	23	20	20	25	25

IR = Immediate Recognition; DR = Delayed Recognition; MC = Multiple Choice; PA = Paired Associates.

malingering group") and compared with the control group. Group means and S.D.'s are presented in Table 2. This permitted an analysis of whether participants asked to fake-bad differed from participants asked to simply complete the measures to the best of their ability. Mann–Whitney *U* analyses were used to detect differences between these two groups, as there was marked heterogeneity of variance. Second, 2×2 ANOVAs were used to test for effects of instructional condition within the four malingering groups (naïve group, coached group, informed group, and coached and informed groups). The independent variables were coaching and information. These analyses allowed the examination of whether one level of preparation had significant effects when compared to another, and whether preparation produced a significant advantage over no preparation. A one-way ANOVA was used to examine the differences between the control group, the coached group (collapsed across levels of information), and the uncoached group (also collapsed across levels of information).

Finally, Rogers et al. (1993) report that using more than one malingering measure allows an examination of inconsistent performances across tests. Poor performance on one measure accompanied by a high score on a similar measure indicates possible dissimulation. In order to examine whether inconsistent test performance was present, a chi-square was used to test for significant inconsistent scores between the CARB-97 and WMT-Immediate Recognition, as these two measures are quite similar in task demands.

3. Results

3.1. Group demographics and motivation

Mean NAART scores ranged from 105 to 108. ANOVA results revealed no significant differences between groups in age, $F(4, 120) = 0.83$, ns, or NAART score, $F(4, 120) = 0.96$, ns. Thus, there is no evidence of group differences in demographics or general cognitive ability at the onset of the study.

Data regarding how successful the participants reported that they were in complying with the experimental instructions were analyzed by separate univariate ANOVAs. There were no significant differences between groups based on perceived motivation to participate in the study, $F(4, 120) = 1.21$, ns, how well participants remembered the experimental instructions, $F(4, 120) = .748$, ns, or how successful participants felt in complying with the experimental instructions, $F(4, 120) = 1.24$, ns.

3.2. Comparisons with control participants

When examining performance on the CARB-97 and WMT, the control group did very well on every measure, demonstrating a mean performance that approached 100% and showing little variability (see Table 2). This performance indicates that the measures are relatively easy tasks to complete, and when good effort is put forth participants miss very few items. Performance that falls significantly below the control group mean on malingering measures is suggestive of incomplete effort. Indeed, the collapsed malingering group ($n = 100$) scored well below the control group on every measure. A Mann–Whitney U statistic revealed that the collapsed malingering group differed significantly from the contrasts on all measures ($P < .001$ for all comparisons).

RTs for the CARB-97 and the Delayed and Immediate Recognition subtests of the WMT were also analyzed. Analysis of RTs has been identified as a potential (and more covert) method of identifying response styles that may indicate incomplete effort (Rose et al., 1995). A Mann–Whitney U statistic indicated that the control group responded significantly faster and with less variability then the collapsed malingering group ($P < .001$ for all comparisons).

In addition to analyzing performance on individual measures, consistency across instruments was examined. Inconsistent test performance is one method of identifying incomplete effort or dissimulation. Because scoring less than 90% correct on the CARB-97 and WMT-Immediate Recognition tends to be indicative of poor effort towards testing according to the test developers, we dichotomized all participants into those who scored below this cut score on one measure, but not the other (i.e., inconsistent test performance), or those who performed comparably on both measures. No participants in the control group had an inconsistent performance, while 16 (16%) in the collapsed malingering group had a suspicious score

Table 3
Summary of 2 × 2 ANOVA: main effects and interactions by *F* ratio

Test	Main effect: coaching		Main effect: informing		Interaction: coaching versus informing	
	F	*P*	*F*	*P*	*F*	*P*
CARB-97						
Percent correct	13.25	.00	3.29	.07	1.51	.22
Mean RT	0.20	.64	0.20	.64	0.27	.60
S.D. RT	1.91	.17	1.73	.19	0.49	.48
WMT						
IR						
Percent correct	4.13	.03	4.36	.03	2.84	.09
Mean RT	0.09	.76	1.27	.26	0.27	.60
DR						
Percent correct	12.33	.00	5.35	.02	1.94	.16
Mean RT	2.27	.06	3.49	.06	1.08	.30
MC						
Percent correct	10.92	.00	4.94	.02	1.20	.25
PA						
Percent correct	13.22	.00	3.26	.07	1.93	.16

All F scores have $df = 1, 96$.
IR = Immediate Recognition; DR = Delayed Recognition; MC = Multiple Choice; PA = Paired Associates.

on one measure and not the other. A chi-square analysis revealed this group difference to be significant, $\chi^2(1) = 4.59$, $P < .05$.

3.3. *Effects of different levels of preparation*

The analyses described above indicate that the collapsed malingering groups differed significantly from the control group. A second set of analyses was performed to examine differences among the four malingering groups due to levels of preparation. A series of 2 (coach vs. no coach) × 2 (information vs. no information) between groups ANOVAs was performed, with response accuracy and reaction time (in separate analyses) as the dependent measures (see Table 3 for a summary of the results).

With regard to response accuracy, there was a main effect for coaching on every measure. The coached groups generally scored better (less blatant malingering) than the other groups. A main effect for information was found for three subtests of the WMT: Immediate Recognition, Delayed Recognition, and Multiple Choice; however, these effects were minimal. Additionally, in all cases, the groups provided with brain injury information scored more poorly than the other groups, an effect that was unexpected. There was no significant interaction between coaching and information on any measure.

As noted above, there were minimal main effects of information. It was deemed desirable, therefore, to collapse the groups across conditions to form collapsed coached and collapsed not coached groups that could be compared to the control group. Table 4 contains a summary of

Table 4
Summary of one way ANOVA to compare collapsed coached versus collapsed not coached versus control

Test	*F*	*P*
CARB-97		
Percent correct	45.63	.000
Mean RT	13.47	.000
S.D. RT	28.77	.000
WMT		
IR		
Percent correct	38.98	.000
Mean RT	12.56	.000
DR		
Percent correct	51.76	.000
Mean RT	14.63	.000
MC		
Percent correct	62.02	.000
PA		
Percent correct	59.01	.000

All F ratios have $df = 2, 122$.
IR = Immediate Recognition; DR = Delayed Recognition; MC = Multiple Choice; PA = Paired Associates.

the ANOVAs that compared these three groups. An omnibus F revealed significant differences on every measure ($P < .000$). Post-hoc Scheffe tests revealed that the performance of the two collapsed malingering groups were significantly worse than the control group ($P < .001$ for all comparisons). However, the collapsed coached group scored significantly better than the collapsed uncoached group for percent correct ($P < .001$ for all comparisons). Coaching appears to have significantly improved the performance of participants who received it, although, they still performed significantly worse than those asked to do their best.

RTs for the four malingering groups were also analyzed using a 2×2 ANOVA (see Table 3). In contrast to the significant group differences in response accuracy, there were no significant main effects of coaching or information when analyzing RTs for the CARB or WMT (see Table 3). All of the malingering groups, regardless of the level of preparation, took roughly the same amount of time when responding to the test items, with roughly equivalent rates of variability. There were no significant interactions.

4. Discussion

On these standardized tests of effort and malingering, analog participants who were asked to feign memory impairment generated significantly better (i.e., more believable) patterns of performance after being exposed to specific coaching to defeat the test measures. Specifically, on the CARB-97 coached participants generally scored much better than chance (75%), while naïve participants scored near chance (53%). Similar results were found with the WMT subtests as well.

Nevertheless, even with coaching, the malingering groups still performed substantially worse than did participants who were asked to try their best. When compared to normative standards for the measures, the coached malingerers' scores fell into a range that suggests they were not trying their hardest. Allen et al. (1997) report that patients with brain injury who are not believed to be malingering regularly get more than 90% of the CARB-97 items correct, making the mean percent correct in the coached malingering groups (75%) suspiciously low. Similarly, on the WMT, Green et al. (1997) report that brain injured patients typically around 95% on the Immediate and Delayed Recognition portions of the WMT, and above 80% on the Multiple Choice and Paired Associates subtests. Thus, even the coached malingering group scored well below that, and in a suspicious range.

When examining the results about providing participants with brain injury information, a surprising finding emerged. Providing information about the behavioral effects of head injury did not improve malingerers' scores; in fact, the groups that received this information performed more poorly than those that did not receive information. It is unlikely that this finding reflects preexisting differences among the groups, given that participants who received information were similar to those in other experimental conditions in terms of demographic characteristics and general cognitive ability. This result also cannot be explained on the basis of the amount of material that participants were presented with, because those who did not receive information about head injury were given a comparable amount of material to read about a topic of similar complexity. Thus, while there was no evidence in our data that coaching together with information had additive effects in their influence on performance, this result must be interpreted within the context of the unexpected finding that information about head injury did not have any demonstrable positive effect on performance.

The CARB-97 and WMT have the advantage of providing RT data. Allen et al. (1997) note that RTs can be used to analyze effort. They report that patients who fail the CARB-97 tend to have longer, and more variable, RTs then those who appear to be putting forth their best effort. Consistent with the Rose et al. (1998) findings, the malingering groups took substantially longer to respond to the items than did the control group. No significant RT differences were found, however, among the malingering groups. That is, even when coached participants were performing better in terms of percent correct on the malingering measures when compared to their uncoached counterparts, their RTs were similar to those who were getting fewer items correct. Thus, it is possible that RT measures are more resilient to the effects of coaching than are response accuracy indices. It is important to emphasize in this regard that our coaching instructions focused on response accuracy rather than RT; therefore, it is quite possible that participants who receive coaching that includes reaction time information may perform differently on the reaction time measures than did those in the present experiment.

The collapsed malingering group was more likely to have participants who performed above a cutoff for incomplete effort on one measure, while having a passing score on another, which is consistent with the suggestion by Rogers et al. (1993) that inconsistency across several malingering measures may be indicative of poor effort. Therefore, using more than one malingering measure and/or using measures that have several trials (e.g., WMT or CVLT) might aid in detection of malingering.

There are common methodological concerns when analog participants are used to conduct research in malingering. As Rogers and Cavanaugh (1983) point out, asking normal people to fake-bad causes a “simulation-malingering paradox,” because participants are asked to comply with directions to fake-bad in order to provide information about people who fake when they are asked to comply with test directions. Iverson and Franzen (1996) also question the external validity of using analog participants. Further, these results may also limited that they are only two measures of effort without the benefit of being part of a comprehensive, clinically relevant battery. While these concerns do indeed temper our ability to generalize the results of the present study to clinical populations of possible malingerers, the study design does allow us to directly examine the effects of information and coaching on performance within the analog framework.

A second major criticism of analog studies is that it is difficult to mimic the motivation of someone involved in litigation who may be awarded a large sum of money for evidence of cognitive dysfunction. Efforts have been made to minimize these concerns in this study. First, data regarding participant motivation, feelings of success, and ability to remember experimental instructions tend to indicate that these participants felt effective in their roles. While no study can provide the large sums of money often awarded in personal injury cases, they were given the chance to win US$100.00.

These results have several implications for clinical practice. They suggest that practitioners concerned about insufficient effort should consider incorporating RT measures of malingering and that these measures are at least relatively robust despite a coached patient who may deliberately try to fake his or her clinical presentation.

Acknowledgments

The authors wish to thank Lyle Allen at CogniSyst for his generous contribution of the CARB-97 and WMT software.

All instructional sets are available upon request.

Appendix A. Vignette

Please read this story and pretend that it is about you. That is, we would like for you to imagine you are the main character, and what is happening in the story has really happened to you.

Imagine that instead of being a student, you are working full time as a paramedic. Your job is to respond to emergencies in an ambulance. Once there, you provide life saving treatment to the sick and injured. Part of your job is to transport patients to the hospital while continuing medical care while on the way.

One night, you are called to a bar fight. The police are there before you arrive, and have secured the scene to make it safe for you and your partner to enter. There are several people who are injured. As you make your way to one of the injured parties (who appears to be a drunk man with a cut on his face) another fight breaks out. Several groups of people begin to fight, and you and your partner are caught between several groups of people. Although the police try to control the crowd, they are outnumbered. It does not take long before the two of you are surrounded. Barely having time to call for help, you are struck on the front of the head with a pool cue, and are knocked out.

Unconscious, you stay on the ground until back up of officers can control the crowd. You are placed into an ambulance, and start coming around while en route to the hospital. You are somewhat dazed and confused and are kept overnight for observation, although you have not been seriously injured.

Following the injury, you sometimes feel you are more forgetful than before. You also feel like you have trouble concentrating. You realize that when under stress, you have some difficulty concentrating and remembering facts. You quit your job as a paramedic because you feel you can no longer do the job safely. After consulting a lawyer, you learn that the more severe your symptoms, the more money you could receive in a lawsuit. It is possible a head injury could be worth millions of dollars in compensation. You are angry that you were placed in a dangerous situation, and feel that you are owed adequate compensation, especially since you feel that you can no longer do your job.

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