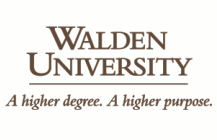

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Using the WAIS-IV to Detect Malingering

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
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Abstract

Using the WAIS-IV to Detect Malingering

by

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MBA, American Intercontinental University, 2007

BIT, American Intercontinental University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

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Abstract

This study used subtests of the WAIS-IV to detect evidence of malingering. Developing reliable tests for malingering could significantly reduce costs paid to malingering individuals. A within-group known-group design was used. There were 3 known-group conditions. The first group (G1) was instructed to take the tests honestly. The second group (G2) was asked to fake a cognitive disability while taking the tests. The third group (G3) took the tests while undergoing the cold-pressor method (hand immersed in cold water) of inducing pain. Analysis of variance was performed. That analysis appeared to have significant differences; post hock Bonferroni testing was done. The G2 scores were significantly different from the G1 and G3 scores. Dependent variables were participants' group scores on Digit-Span and Block-Design subtests of the WAIS- IV. Independent variables were the testing conditions: honest, malingering or laboratory-induced pain. Outcome variables were the score differences within known-group conditions. The outcome variable score differences in this study supported Digit-Span and Block-Design as tests of mental malingering. Positive social change comes through adding an additional Test of Mental Malingering (TOMM) used to aid in detection of those trying to fake cognitive difficulties based on pain symptoms, reducing the associated costs to members of society paying higher costs for healthcare, and for government paying unnecessary compensation benefits to those who are malingering who do not deserve it.

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DEDICATION

I dedicate this dissertation to my father Don L. Bybee who encouraged my education through example and financial aid when I started my study at Utah State University in my youth. He passed away after I began my doctoral studies, and he was the only one in his family to go as far as he did in school, becoming an attorney after earning his Jurist Doctorate (JD) law degree the year I was born. My father was always an example to me of the value of education in one's life and because of my father's example, I decided to make myself a commitment that "failure is not an option," and that I would do my best to honor him and finish my doctorate degree.

I also dedicate this dissertation to my wife, Rita, without whom I would not have been able to complete this work due to her love and never-ending support. She has been an unflinching supporter of my school work, over more than a decade of continuing undergraduate and graduate school work. She supported my studies through my Bachelor's Degree in Information Technology, my Master's Degree in Business Administration (MBA), and nearly 9 years of Ph.D. studies. Rita has been my inspiration and my loving companion and I wish to thank her with all my heart and soul.

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I would like to acknowledge the prayers and loving concern of my children and spouse who have supported me through prayer, fasting, and love. I would like to also acknowledge the answering of those prayers from a loving Father in Heaven who has helped my family to have sufficient for our needs during the time of my studies, for making possible our family's move to our new home in Arizona from Utah, and for the ability to attend residencies and professional conferences and still have the funds to meet the necessities of life.

The many prayers of my children that I would get my school work done and all my other work done are an inspiration to me, and their faith in me as their father gives me the strength to continue when times get difficult as they often do.

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Chapter 1: Introduction

Introduction

Finding tests for the detection of malingering which are effective and current is a problem that is important to reduce the costs caused by those who malinger cognitive difficulties due to faked pain for their own personal gain causing increased expense to others.

Older versions of the WAIS-III intelligence scales have been used in the past but the most current version the WAIS-IV intelligence scales has been changed since the WAIS-III with a new sequencing component not found in the previously used WAIS-III.

This purpose of this study was to evaluate the efficacy of the Digit-Span subtest and the Block-Design subtest of the Wechsler Adult Intelligence Scale-IV (WAIS-IV, Wechsler 2008) for use as Tests of Mental Malingering (TOMM)

A previous study (Etherton, Bianchini, Greve, & Ciota, 2005) used WAIS-III subtests (Wechsler, 1997) but not the Block-Design subtest. The lack of studies using the Digit-Span and Block-Design subtests of the newest version of the WAIS-IV for detecting malingering represents a gap in the literature. According to Whitney, Shepard, and Davis (2013), the Digit-Span task in the WAIS-IV differs substantially from earlier versions of the testing measure because of the addition of a sequencing component. This is important because the APA ethical standards require the use of the most current testing

instrument and the changes between the two versions of the WAIS-III and WAIS-IV are substantial with the new sequencing component.

The Digit-Span subtest calls on left-brain cognitive functions, although there is some cross-hemisphere function as well (Mammarella & Cornoldi, 2005). According to Chance (2014), the left hemisphere is used for processing speech. The right hemisphere of the brain performs more holistic visual, spatial, and lower resolution processing. The Block-Design subtest evaluates more of the right brain visual-spatial functions with its own cross-brain function in processing visual memory and in logical reasoning.

In the Patel, Barakat, Romero, Apodaca, Hellige, and Cherry,(2014) study, when the Digit-Span was administered along with dot number matching, older subjects did better with left hemisphere reasoning based on their scores with the digits compared to younger participants who showed more cross hemisphere visual-spatial abilities advantage based on their scores on the dot number matching

Using the Digit-Span and Block-Design subtests of the WAIS-IV (Wechsler, 2008) as a TOMM, this study yielded updated information on detecting feigned cognitive disability in malingerers.

The results of this study provide further evidence of the efficacy of the WAIS-IV subtests as a TOMM for detecting malingerers who are seeking secondary, external gain by faking cognitive disability. Compensation to malingerers costs billions in claims and increased financial costs to pay for those faking for personal financial gain or avoidance of work, military service, or other responsibilities (American Psychological Association

[APA], 2013). According to Chafetz and Underhill (2013), in the year 2011 the figure was $20.02 billion for adult disability claimants.

This study sought to replicate portions of a 2005 study by Etherton, Bianchini Greve, and Ciota, (2005) using the same Criterion Group Validation (CGV) conditions. The study had different known-group conditions, such as purposely trying to fake cognitive difficulties, actually experiencing laboratory-induced pain conditions, or taking the tests honestly which were compared to each other. CGV in this study assumed and expected that there would be no current pathology of malingering in the participants.

This study followed the earlier study's comparison of CGV known-group conditions to determine whether there were significant differences of the within-group scores. The addition of Block-Design subtest for testing visual-spatial abilities in this study added another dimension compared to previous studies.

The dissertation study included the subject of pain and chronic pain causing cognitive impairments chronic pain-related disabilities, and the extent of the pain experienced—influences the financial benefits received by claimants. There are pain claimants who deserve compensation. There are also pain claimants who are malingering for secondary gain, usually of a financial nature. The worse the impairments are due to pain, the greater the compensation and the greater the incentive for claimants to fake difficulties (Chafetz & Underhill, 2013). This represents a chronic pain type of disability and it was simulated in this study using the cold pressor pain induction method (CP) in order to see the effect of laboratory-induced (CP) pain on the scores of participants taking

the WAIS Digit-Span and Block-Design subtests. So the scaled scores of those with pain could be compared to honest and faking individuals.

In previous studies (e.g., Etherton et al., 2005), there were statistical differences among all groups: those who were trying to fake cognitive problems, and those experiencing laboratory-induced discomfort or pain, and those taking the tests honestly. In the Etherton et al. study, all of the participants—both in the laboratory-induced pain condition and the honest condition scored above the standard cutoff range of 33-44. Overall, the scores of those with laboratory-induced pain were no different from those without pain and taking the test honestly (Etherton et al., 2005). Real chronic pain may cause difficulties in cognition through lack of attention or focus or in the amount of effort the person is able to put into testing. Some difficulties in cognition may be due to such factors as fatigue, pain medication, and lack of sleep (Jensen & Turk, 2014). Severe pain and chronic pain do not always have obvious physical signs or symptoms. Those with real cognitive difficulties caused by their pain or disabilities are often compensated based on their disability and the amount of pain and the amount of wages they have lost in their present circumstances (Greve, Etherton, Ord, Bianchini, & Curtis, 2009).

For those who are malingering pain and chronic pain, their symptoms are easily exaggerated, exaggerated both for those who are malingering and those who have a factitious disorder according to Heilbronner et al. (2009). The amount of effort put into test taking can skew the results if a person is not giving the testing their best effort. Most malingerers are working to get monetary secondary gain through litigation or Workmen's

Compensation. According to Greve et al. (2009), Workmen's Compensation bases its remuneration on the severity of the symptoms, so there is some incentive for malingerers to feign that they are worse than they really are for greater secondary gain: monetary. One element in evaluating a disability payment has to do with lost future wages, but when cognitive and/or emotional abilities are also disabled, the individual can claim additional compensation. Malingerers have greater incentive for the faking cognitive disabilities in addition to pain: they get more secondary gain.

Background

Detecting malingering related to discomfort, pain, and cognitive abilities has been studied in the past using an older version of the WAIS subtests (Etherton et al., 2005). The older study used a CGV known-group design and a three-group condition sample consisting of those who completed the subtests honestly, those with laboratory-induced discomfort and pain, and those who were intentionally faking, just like the current study Etherton et al. (2005) used the Digit-Span and word-memory subtests of the WAIS-III for their study. This study used the updated WAIS-IV subtests of the Digit-Span with its added sequencing component and included the Block-Design subtest.

Diagnosing malingering involves the malingerer having an external reward whereas factitious disorder is absent of external reward (APA, 2013). A factitious disorder is a form of a Somatoform disorder which represents an effort to gain attention; they are true mental disorders, not malingering. Somatoform disorders have been reclassified in the 2013 *Diagnostic and Statistical Manual of Mental Disorders-5* as

somatic symptom disorders (APA, 2013). The symptoms may or may not be related to medical issues. Comorbidity of both mental disorder and physical cause cannot be ruled out. Both a physical and mental cause for the somatic symptom disorder symptoms may or may not be present with the disorder.

Problem Statement

Some previous TOMM studies have used mainly the older version of the WAIS-III subtests and focused mainly on those that assessed cognitive abilities of the left brain with some cross-hemisphere functions (Etherton et al., 2005; Gust, 2009). The Digit-Span and Word-Memory subtests of the WAIS-III were used and little attention was paid to visual-spatial cognitive abilities (Etherton et al., 2005). The fact that currently available tests were not used and that the testing of right-brained cognitive functions (visual- abilities) were not studied as a TOMM, represent a gap in the literature on detecting malingering. The (APA) Ethical code of conduct; APA Ethical Principles of Psychologists and Code of Conduct section 2.07 states: "(a) Psychologists do not base their assessment or intervention decisions or recommendations on data or test results that are outdated for the current purpose; (b) Similarly, psychologists do not base such decisions or recommendations on tests and measures that are obsolete and not useful for the current purpose" (APA, 2013). The Diagnostic and Statistical Manual Of Mental Disorders, Fifth Edition (*DSM-5*, 2013) classifies malingering as 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. Under some circumstances, malingering may represent adaptive behavior – for example, feigning illness while a captive of the enemy during wartime," (p.726-727).

According to (*DSM-5*, 2002, p.726-727), malingering should be considered if there is a combination of different things present:

1. Medico-legal content of presentation (e.g., the person is referred by an attorney to the clinician for examination).

2. Marked discrepancy between the person's claim of stress or disability and the objective findings.

3. Lack of cooperation during the diagnostic evaluation and in complying with the prescribed treatment regimen.

4. The presence of antisocial personality disorder.

The WAIS-IV was used in the present study in the place of the older test measures (WAIS-III) used by Etherton et al. (2005). Also, the study of right-brained visual-spatial abilities was added using the Block-Design subtest, which expanded on the results of previous studies as reported in the literature in the literature.

Purpose of the Study

This study examined whether the Digit-Span and Block-Design subtests could serve as tests of TOMM. Individuals participated in three known-group conditions in this study; the group that was instructed to simulate malingering conditions was compared to

the group taking the subtests test honestly and the known-group taking the subtests while experiencing laboratory-induced pain conditions.

Significant differences in scores were expected within the individuals in the known-group condition who were faking cognitive difficulties, and those who were either taking the tests honestly or actually experiencing laboratory-induced pain conditions. Visual-spatial abilities were an additional component tested in this study in order to see whether the right-brain functions tested by the WAIS-IV Block-Design subtest would show similar differences within G1, G2, and G3conditions.

For simplicity and clarity, the following terminology was used for the research questions and hypotheses:

G1: Control Group condition (those taking the subtests honestly)

G2: Faking Group condition (simulated malingering)

G3: Laboratory-Induced Pain and Discomfort group condition (those experiencing pain and discomfort through the cold pressor technique)

Research Questions and Hypotheses

RQ1: Quantitative: Will there be differences in scores among the three group conditions on the Digit-Span subtest?

*H*10There will be no difference in scores among the three group conditions on the Digit-Span subtest.

*H*1A: Group condition 1 participants will perform better than group condition 2 participants on the Digit-Span subtest.

*H*1B: Group condition 1 participants will perform better than group condition 3 participants on the Digit-Span subtest.

*H*1C: Group 2 will perform better than group condition 3 on the Digit-Span subtest.

*H*1D: Group 2 will perform better than group condition 1 on the Digit-Span subtest.

*H*1E: Group 3 will perform better than group condition 1 on the Digit-Span subtest

*H*1F: Group 3 will perform better than group condition 2 on the Digit-Span subtest

RQ2: Will there be differences among the three group conditions' participants on the Block-Design subtest?

*H*20There will be no difference in scores among the three group conditions on the Block-Design subtest

*H*2A: Group condition 1 participants will perform better than group condition 2 participants on the Block-Design subtest.

*H*2B: Group condition 1 participants will perform better than group condition 3 participants on the Block-Design subtest.

*H*2C: Group 2 will perform better than group condition 3 on the Block-Design subtest.

*H*2D: Group 2 will perform better than group condition 1 on the Block-Design subtest.

*H*2E: Group 3 will perform better than group condition 1 on the Block-Design subtest.

*H*2F: Group 3 will perform better than group condition 2 on the Block-Design subtest.

Theoretical Basis

The theoretical basis of this study was Criterion Group Validation (CGV; Frederick 2000)—a method of finding positive and false positive rates of tests and diagnostic scores. It requires that the researcher have confidence about the presence or absence of pathology in every participant used in the study. The participants—a convenience sample—were asked to participate and were willing to take part in all three known-group conditions. Malingering was detected by examining the participants' scaled scores in known-groups conditions ((a) those taking the tests honestly, (b) those taking the tests while experiencing laboratory-induced pain, and (c) those simulating malingering by faking cognitive impairment conditions). . Since this study was for detecting malingering, the participants in the known-group condition was presumed to be absent of the pathology of malingering.

In (Etherton et al., 2005), the initial sample size was $N = 70$. But 10 of the recruits were eliminated at the entrance interview, the total was $N = 20$ for each group condition.

Those experiencing pain and those taking subtests honestly did not have statistically different scores. The faking group performed significantly poorer than both of the other two CGV known-groups conditions. This study attempted to see whether it could partially replicate that finding. It was important to determine whether the differences within/between group conditions made the approach used in this study an effective means to detect possible malingering of cognitive abilities.

Nature of the Study

This study used a quantitative experimental design simulating faking and creating pain-related conditions and comparing them to honest test takers. G1 and G3 were compared to G2. Each group took the Digit-Span and Block-Design subtests of the WAIS-IV (Wechsler, 2008). The focus of this study was based on the earlier study's (Etherton et al., 2005) CGV methods in order to see whether the proposed approach using the WAIS-IV subtests was comparable to the research that was conducted using the earlier version of the subtests included in the WAIS-III.

This study used the WAIS-IV subtests, Digit-Span and Block-Design, for detection of possible malingering. Individuals in known-groups Conditions took the subtests to the best of their abilities in all three conditions, and the scaled scores of the groups were compared for differences. The differences in the participants' group scaled scores showed possible malingering by the individuals of the group condition which was faking cognitive difficulties.

Definitions

Cold pressor method: This method of pain induction consisted of submersion of part of the body in cold water. This cold pressor test method is thought to mimic chronic pain conditions effectively. The colder the temperature of the cold water, the greater the degree of pain induced in participants. The cold pressor method of pain induction is widely used in evaluating physiological and psychological treatments for pain (Mitchell, MacDonald, & Brodie, 2004).

Criterion Group Validation: Criterion Group Validation (CGV) is a known-group design. Criterion group validation is a way of comparing test scores to a variable called a criterion (Frederick, 2000). Criteria are applied to known-groups of participants within a study such as in this study. The control group condition takes the tests honestly in a normal fashion, the pain group condition takes the tests with CP induced pain, and the faking group condition is given instructions to fake, but not too badly, while taking the tests. Criterion group validation is purely a statistical process; it is all about amassing evidence demonstrating that a test score is related to a target criterion.

External Secondary Gain: External or secondary gain is the term used when the individual is motivated by financial or external gain, or avoidance of responsibilities, and for attention from others (Schultz & Gatchel,2008).

Faking Good: Sometimes called under-reporting, faking good is trying to manipulate a psychological test result in a direction that is not pathological (Kitaeff, 2007)

Factitious disorder: A factitious disorder is characterized by intentional faking of symptoms due to a psychological need to play a sick role to obtain emotional internal gain (APA, 2013). The DSM-V criteria for factitious disorder are:

- Intentional production or feigning of physical or psychological signs or symptoms.
- The motivation for the behavior is to assume the sick role.
- External incentives for the behavior (such as economic gain, avoiding legal responsibility, or improving physical well-being as in malingering) are absent.

Faking Bad: Faking bad is sometimes called simulation or over reporting of psychopathology, faking bad can be motivated by secondary gain or a plea for help according to Greene (1997). Faking bad can have to do with trying to manipulate the results of a psychological evaluation (APA, 2013).

Internal or Primary gain: Primary gain is internal and is done for internal motivations such as a desire for attention or to justify oneself for not having to feel guilty about one's inability to do something by blaming it on a medical condition. The gain might not be obvious to an outside observer, unlike secondary gain where the gain is external and observable (Jones, Melany, Carmel, & Ball, 2008).

Malingering: Malingering (APA , 2013) in and of itself is not a mental illness but is a kind of fraud where the person malingering is trying to benefit from external or secondary gain from feigning or faking. The malingerer is faking a physical, mental, or

cognitive problem in order to obtain a financial reward (secondary gain) or is avoiding some kind of situation such as military service or other responsibilities.

Psychosis: Psychosis is a loss of contact with reality and sometimes includes delusions and hallucinations. Thoughts and emotions become so impaired the person experiencing psychosis may lose touch with reality (Freudenrich, Weiss, & Goff 2008).

Somatic Symptom Disorder: The DSM-5 (APA, 2013) states that in order to meet the new criteria for a somatic symptom disorder a patient must have one or more chronic somatic symptoms they are excessively concerned about, preoccupied with, or fearful of.

Symptom Validity Test: A Symptom Validity Test is a measure of neuropsychological testing where tests are given to see whether an individual is faking good, faking bad, or malingering to get secondary gain (Bigler, 2012).

Test of Mental Malingering: This test of mental malingering is used to identify those who are malingering or faking mental disabilities in order to obtain some kind of secondary gain (Schretlen, 1988).

Sources of Information

Data for statistical analysis was gathered from participants in all three group conditions of the CGV known-groups: (a) pre- and post-study interview data, (b) testing score data, and, (c) in the pain group, self-report Likert scale data— similar to those used in a doctor's office (Uebersax, 2006)—about their groups members feelings about the amount of pain.

Social change

It is expected that this study will have both an economic and a social impact . Malingering is a huge drain on Social Security benefits and, for adult claimants in 2011, it cost $20.02 billion dollars (Chafetz and Underhill, 2013). It is also a problem—one that needs detection methods that work. Detection of malingering can lessen the impact of the claims made by those who are malingering to get disability income from faked pain.

Assumptions

The study was designed to determine objectively whether the Digit-Span and the Block-Design subtests of the WAIS-IV intelligence scales (Wechsler, 2008) were a viable means to detect malingerers.

- It was assumed that the participants in the study were representative of the population at large and did not have the psychopathology of malingering.
- It was assumed that participants performed to the best of their abilities in the subtests. Before testing and at the end of testing, participants were reminded that they were expected to do their best in the testing. At the end of the testing, participants were asked to declare if they had done their best.
- It was assumed that participants were being truthful when asked about the medications they were taking. The question about their medications affecting them was asked before taking the tests so that it would not bias the results.

- It was assumed that participants would be truthful about being in good health while taking the tests. . However, they were asked specifically if they felt in good health.

Scope and Delimitations

Only individuals who were claiming to not have cognitive difficulties and were, according to a self-report, healthy and able to take the tests to the best of their abilities were included in the testing. The population of the study was a convenience population and was limited to the ages between 18 and 90 that the testing instrument was designed to study. The study was limited to healthy individuals so that the risk to participants who were subjected to the CP method of pain induction was minimized.

The study involved a group with 18 participants. Each participant participated in all three group conditions of the study.

Only the scaled scores of the participants were compared. The order of administration was not kept for individual participants. I kept track of it to counterbalance the administration of the subtests between different participants.

The use of the current Digit-Span and Block-Design subtests were expected to help in detecting malingerers who may have escaped detection using the techniques employed in the previous study (Etherton et al., 2005).

In this study, the known-group condition scores did not show a repetition effect within the similar groups trying to do their best in different situations. The faking participants were however purposely trying to simulate someone who was malingering

and not trying to do their best. The score results of the honest and CP were nearly identical while trying to do their best, but the faking group scores were significantly different than the honest and CP group conditions scores.

Scheduling of testing had to coincide with participants' schedules and availability which was a limiting factor for group sample, size, and time to complete the study.

Limitations

This study was subject to the following five weaknesses: participants' test-taking effort, health, level of cognitive abilities, accuracy of their self-reported health, , and the possibility of repetition effect. Subtests administrations were counterbalanced with 6 different orders of treatment and all three tests were administered to each individual to help minimize the possibility of a repetition effect.

According to Oberauer, Jones, and Lewandowsky (2015) in the Hebb repetition effect (Hebb, 1961), Repetition effects were not noticed due to the counterbalancing of test administration. Testing time and scheduling had to coincide with the participants' schedules and availability. None of the friends or family was treated any differently than any other participants and the effects of their relationship to the researcher would not have made a difference due to the consistent treatment of all participants. The subtests were administered according to the WAIS-IV administration and scoring manual and in the same manner to all participants. The only difference was the conditions of the

administration being tested by the three conditions of the test in the three groups G1, G2, and G3

Significance

This study was expected to provide more current information about the validity of using the WAIS-IV subtests as a TOMM. WAIS-IV could prove to be a method that takes little time and effort to detect malingerers. Additional information from the Block-Design subtest could add more information about cognitive abilities and testing of visual-spatial abilities. According to Chafetz and Underhill (2013), test measures that help to detect malingering and eliminate false positives and negative bias in testing are important for social change due to the size and cost of the problem of malingering. They claim that, in the year 2011, the figure was $20.02 billion for adult disability claimants alone .

The present study, like a previous study (Etherton et al., 2005), used CGV known-group design conditions (Greve & Bianchini, 2004; Rodgers, 2008) in order to establish an acceptable range of cutoff scores in those experiencing pain while undergoing the psychological evaluation.

Summary

This purpose of this study was to evaluate the efficacy of the Digit-Span and Block-Design subtests of the WAIS-IV for use as TOMMs, and to partially replicate parts of an earlier study that used the WAIS–III. Using the most current tests constitutes an ethical standard of the APA Ethical code of conduct, APA Ethical Principles of Psychologists and Code of Conduct section 2.07.

Chronic-pain–related disabilities and the degree of pain, influence financial claims, amounts, and benefits received by claimants as part of disability claims. Some pain claimants deserve compensation; some are malingerers.

Detecting malingering related to pain discomfort and cognitive abilities has been studied in the past using old versions of intelligence tests. The WAIS-IV is currently used in the place of the WAIS-III. This current study examined whether the Digit-Span and Block-Design subtests of the current version of the WAIS-IV can serve as TOMM. This study consisted of three study groups:

G1: Control Group Condition (those taking the subtests honestly).

G2: Faking Group Condition (simulated malingering).

G3: Laboratory-Induced Pain and Discomfort group Condition.

Significant differences in scores were expected between those who were faking cognitive difficulties and those who were either taking the tests honestly or experiencing laboratory-induced pain.

The impact of this study on social change could be both economic and social. Malingering is a huge drain on financial compensation benefits and cost over $20.02 billion in adult disability claims in 2011.

Chapter 2: Literature Review

Introduction

Diagnostic Classification and Models of Malingering

Malingering is different from factitious disorder and somatoform symptom disorders. Malingering is motivated by external gain or secondary incentive or secondary gain. In factitious disorder, symptoms are faked in order to get attention; in somatoform symptom disorders, a person presents with physical symptoms which are real to them (APA, 2013).

Sigmund Freud first introduced the idea of Secondary gain.

When considering the differences between malingering and the factitious or somatoform symptom disorders, secondary gain has become one of the determining concepts. Freud described primary gain as an unconscious intra-psychic phenomenon in which anxiety becomes reduced by an internal gain as a result of illness behavior, and so behavior is distinguished between primary gain and secondary gain because secondary gain is external reward such as monetary reward, rather than internal primary internal gain. The distinction between the two is whether the potential gain is an internal or external incentive (Freud, 1917)

Factitious disorders and malingering are similar in that both involve the faking of an illness or disorder (APA, 2013). A factitious disorder is different from malingering in that the person who is feigning illness is doing so for reasons such as getting attention from a loved one or from their doctor. This attention is an internal or a primary gain of

some kind. Malingering has the key feature of secondary gain (such as financial) to distinguish it from a factitious disorder. Greve and Bianchini (2004) distinguished between Malingering and somatization disorders by stating that malingering is a conscious process and somatization is an unconscious process.The current *(DSM,* 2013) replaces Somatization Disorder with the classification of Somatic Symptom Disorder.

Somatic symptom disorder is different from both malingering and factitious disorders because there is not a conscious intent underlying production of symptoms whereas with factitious disorders or malingering there is some kind of a conscious effort to fake symptoms to get either primary or secondary gain. Secondary gain has to do with external incentives and can be a reason for a person to malinger (Heilbronner, Sweet, Morgan, Larrabee, & Mills, 2009). A malingering person may feign symptoms for secondary gain (Heilbronner et al., 2009).

Factitious disorders are different from Somatic symptom disorder according to the Diagnostic and Statistical Manual of Mental Disorders (APA,2013). The factitious disorders are characterized by intentionally produced or feigned physical or psychological symptoms. It is distinguished from malingering in that a malingering individual also produces the symptoms intentionally but has a goal that is recognizable such as trying to get some kind of secondary gain. A factitious disorder has more to do with getting attention or to fulfill psychological needs to take on the sick role without having as a motive secondary external gain.

Malingering has more to do with an intentional production of falsely exaggerated psychological or physical symptoms that are motivated by an external gain of some sort which is referred to as secondary gain (APA, 2013). Malingering is characterized by goals such as avoiding military duty, avoiding work, or getting some kind of a financial compensation.

A survey of the beliefs and practices of different neuropsychologists in six European countries (Germany, Italy, Denmark, Finland, Norway, and the Netherlands) done in 2013 found that they possessed technical knowledge about symptom validity testing (SVT), but of the group questioned ($N = 515$), a minority of the participants reported an outdated notion that symptom credibility could be determined based on intuitive judgment. Their findings were that there are some concerns about administering and communicating symptom validity tests to those being tested and that there needs to be more systematic research done (Dandachi, Ponds, & Merten, 2013).

Early instances of malingering go as far back as 760–710 BC, according to Altschuler, Calude, Mead, and Paget (2013). An example from ancient literature is found in the Homeric epics The Iliad and The Odyssey. The mythical figure Odysseus (Ulysses, son of Laertes).before the Trojan War was asked to rescue Helen of Troy. Odysseus tried to avoid retrieving Helen, according to the mythology, when Menelaus called upon the other suitors to honor their oath and retrieve Helen, an attempt that would lead to the Trojan War. In an attempt to look insane, Odysseus engaged in malingering by hooking both a donkey and an ox to his plough because they have different stride lengths to

reduce the efficiency of the plough. When his son, who was an infant, was placed in front of the plough, Odysseus veered the plough away from his infant son and was exposed in his malingering stratagem. In another example, the Hebrew Bible tells of David feigning insanity to escape from a King who considered him an enemy (1 Samuel 21:10 – 15).

Malingering patients feigning chronic pain and claiming cognitive disabilities and psychological problems cost a great deal of money and are responsible for significant loss of work time. Malingerers file disability claims totaling more than $20 billion in 2011 (Chafetz & Underhill, 2013). There are lost work hours to employers and increased costs to insurers due to malingering. A reliable means of detection of malingerers needs to be found so that they can be detected and stopped. Some malingerers try to feign cognitive and psychological problems and say that the problems are due to their pain-related injuries (Rodgers, 2008) and that they are unable to return to work claiming a need to receive disability payments for the feigned problems. This lack of returning to work is a type of secondary gain. According to Samuel and Mittenberg (2005), malingering has been estimated to occur in 7.5–33% of disability claimants.

Secondary gain for financial gain, attention, or avoidance of responsibilities such as military service is typical for malingerers, according to the *DSM-5* (APA, 2013). These false claims of pain-related injuries and disability are a large social and economic problem.

There is a need for a more up to date study using the most current version of the WAIS-IV subtests in order to see whether the new versions of the WAIS -IV are as viable

as the WAIS- III was for Etherton et al. (2005) as a TOMM. It is also important to add to the literature whether or not the subtests used in the newer WAIS-IV are useful tests for the detection of mental malingering. Expanding the scope of the testing using different subtests of the WAIS-IV that assess different elements of cognitive function was also a goal of this study.

Search Strategy

In searching the literature, the following databases were used: PubMed, PsycINFO, and additional resources were gleaned from the National Library of Medicine and the website of the National Institutes of Health.

Key search items and phrases used in the searches were the words *Digit-Span, Block-Design, malingerer, malingering, and malingers.* The scope of this literature review was primarily limited to the last 10 years of articles; however some extended back further than that. Current peer-reviewed articles were sought out and.

Theoretical Foundation

The theoretical framework of this study was that of a Criterion Group Validation (CGV) study. Known-group comparison design is stronger for external validity, according to Liu et al. (2013), and requires that the researcher have confidence about the presence or absence of pathology in each participant (Frederick, 2000). And since this study was focused on detecting the existence of malingering, the known-groups in this study needed to be without the pathology of malingering. This was assumed in the sample there was no way to determine pathology for the researcher in this study.

The theory of inquiry into malingering using the CGV conceptual framework is one of a scientific statistical comparison for differences beyond a statistical probability of chance indicating possible malingering. A below-chance score for testing, according to Gust (2009), is a score of 45 or below on the test of TOMM. using the Digit-Span and word memory subtests of the WAIS–III (Etherton et al., 2005). Negative response bias is suspected in those who score below 45. They are either putting forth too little effort or purposely trying to malinger (Etherton et al., 2005). One of the Etherton et al. (2005) groups was told to take the test honestly. One group had laboratory-induced pain and discomfort by use of the cold pressor (CP) method of pain induction. The other group was told to fake cognitive difficulty (trying not to fake too badly) so as to not lose an imagined monetary reward through a fictitious court settlement.

Researchers have used the known-group framework looking for scores that statistically are beyond a normal distribution of scores thus indicating the possibility of a possible/probable malingering individual.

The detection of malingering is done through an examination of the mean scaled score differences of participants in known-groups: those malingering on purpose, those who take the subtests honestly, and those in a CP-induced pain situation. The same Criterion Group Validation (CGV) was used in the Etherton (2005) study.

Previous Studies

In a previous study (Etherton et al., 2005); those who were experiencing pain and those taking the subtests honestly did not have results that were statistically different,

while the faking group performed poorer than both of the other two known-groups. Testing was done by Etherton et al. (2005) showing some participants with score differences outside of a normal statistical distribution of scores.

In using a known-group experimental design with honest, faking, and pain groups, Etherton et al. (2005) used the CP method of pain induction. They tested the efficacy of the WAIS-III subtests for the detection of malingering. The CP method of inducing pain submerges part of the body, usually the forearm or hand of the participant, in cold water at about 45-55 degrees, to cause laboratory-induced discomfort and pain in order to simulate how a participant performs on the subtests while experiencing pain.

In evaluating the performance of the induced pain group and those who were taking the test honestly in the Etherton et al. study, none of the participants scored below 45 on any trial. In contrast, 80–85% of the participants in the faking groups scored less than 45 (failing). More than 50% of this group scored at lower than chance levels (below 17). Of the participants in their trial who were intentionally trying to appear impaired, more than half failed their test of mental malingering at lower than chance levels (i.e., less than or equal to a score of 17).

In the Etherton et al. (2005) study the cutoff scores were as follows:

- A score of 45 – 50 was considered a passing score.
- A score of 33 – 44 was considered a failing score indicating negative-response bias.
- A score of 18 – 32 equaled chance.

- A score of ≤17 was considered to indicate intentionally poorer performance.

Allen, Bigler, Larsen, Goodrich-Hunsaker, and Hopkins (2007) used an fMRI to see what parts of the brain were active when doing a cognitive memory test. A number of cortical areas were found to be activated and used during cognitive efforts (Allen et al., 2007).

Spencer, Axelrod, Waldron-Perrine, Pangilinan, and Bieliauskas (2013) compared the WAIS-IV standard Digit-Span against an age-corrected score. They found that the standard Digit-Span was no more accurate than the age-corrected scaled score in their test subjects. They found that the Digit-Span age-corrected scaled score provided the most accurate measure of performance validity in the measures that they tested. The measurements were taken using a sample of military veterans diagnosed with traumatic brain injuries in a brain injury clinic.

Those with chronic pain complaints of an ambiguous nature related to neurologic injuries who are possibly malingering may also appear to have poor test taking effort (Greiffenstein & Baker, 2006). According to Greve et al. (2010), some pain patients may complain of emotional symptoms and cognitive problems along with the typical physical complaints and limitations after injury. Also, according to Iverson, King, Scott, and Adams (2001), pain patients without head injuries involved in Workers Compensation claims more frequently report symptoms of cognitive disability than patients with head injuries who are not litigating. The litigation of claims appears to influence the frequency

of claims of cognitive disability made to workers compensation of those pain patients without head injuries (Iverson, King, Scott, and Adams, 2001).

Whitney, Shepard, and Davis (2013) found that the Digit-Span sequencing of the WAIS-IV had the best classification accuracy to predict negative response bias but that by itself had a low positive/negative predictive power they concluded that it should not be used in isolation but with another TOMM to identify negative response bias. Negative response bias is a general term for a number of cognitive biases both positive and negative (Furnham, 1986). Response bias according to Furnham (1986) can have an impact on the validity of a questionnaire or survey by someone wanting to look better or worse for some situation or secondary gain, wanting to look better to get a job or promotion for example (positive response bias), or worse (negative response bias) as in the case of a person malingering to get compensation.

To accurately classify detection of malingering it is best to use multiple testing instruments as TOMMs rather than just one testing assessment to detect possible malingering (Whitney et al., 2013). According to Whitney et al.(2013) The Digit-Span subtest alone is less likely to have predictive power for malingering without the use of another additional test.

Greve, Bianchini, and Brewster (2013) Stated that malingering is an act of will. Multiple symptom validity tests (SVTs), such as the Block-Design subtest of the WAIS-IV, were added to the Digit-Span subtest of the WAIS-IV for assessing malingerers. These additional measures increased the odds of detecting malingerers' negative response

bias. Rodgers (2008) recommended the use of multiple SVTs. They can reduce the risk of rejecting a valid claim of pain-related disability and they can increase the accuracy of detecting malingerers.

The most frequently utilized methodologies for malingering research, according to Jasinski, Berry, Shandera, and Clark (2011), include research using simulation and known-group designs. Simulation studies involve participants who are requested to feign symptoms while completing TOMMs. Those feigning symptoms are compared to a "normal" group taking the test honestly. According to Jasinski et al. (2011), simulation studies are often utilized because of their high internal validity. Another consideration, according to Jasinski et al. (2011) is matching the different groups demographically to reduce variation.

Jasinski et al. (2011)states that there needs to be a warning for participants in simulation studies to fake believably to not to get caught faking malingering their symptoms so un-believably that they would lose a monetary or other external reward by faking so badly as to get caught.

In the Greve et al. (2010) study their groups were divided into incentive and non-incentive groups. Their study sample consisted of 612 patients divided into six different groups. Their groups were based on evidence of malingered pain related disability: (MPRD) no-incentive; not MPRD, incentive-only; not MPRD indeterminate; possible MPRD; probable MPRD; definite MPRD. The Greve et al. (2010) study had a total of 30

college students who were simulators deliberately faking they had lower Digit-Span scores and higher rates of Digit-Span failure than those who are classified as MPRD.

One characteristic of malingering, according to the (*DSM-V,* 2013), is that those malingering are doing it for a secondary external gain or incentive. Studies using the older version of the WAIS-III (Wechsler, 1997) and replication studies using the newer version of this test WAIS-IV (Wechsler, 2008) have focused primarily on Digit-Span and word-memory subtests. I found only one study that used the newest version WAIS-IV: Jasinski, Berry, Shandera, and Clark (2011). Their article discussed neuropsychological assessments and specifically the Digit-Span subtest. It discussed how the results of testing may be rendered useless if participants are feigning or if suboptimal effort is made (Jasinski et al., 2011). The researchers used both the Digit-Span and/or corrected scaled score (Digit-Span) variant and stated that their study was effective in discriminating honest from dishonest responders (malingerers) in the Digit-Span tests (Jasinski et al., 2011).

Spatial ability is a person's skill in perceiving the visual world, including the transformation and/or modification of those perceptions, and recreating spatial aspects of one's visual experience in the mind (Linn & Petersen, 1985). Spatial manipulation involves the ability to mentally manipulate or re-create a pattern that can be either two- or three-dimensional in nature and to do so rapidly and accurately (Linn & Petersen, 1985). Spatial ability includes understanding and remembering spatial relations with different objects in the environment and being able to re-create those relations between objects

(Gilbert, 2005). Visual-spatial skills are important for solving tasks in everyday life like driving or using a map or understanding a reverse image in the mirror when doing activities like shaving or brushing your teeth or hair. The study of cognitive abilities includes spatial abilities, and yet no studies have been found that test those abilities as part of a TOMM.

Visual-spatial abilities are also used in many different kinds of work such as mechanics, engineering, architecture, mathematics, and computing (Stumpf, Mills, Brody, & Baxley, 2013). The Block-Design subtest of the Wechsler Intelligence Scale assesses both Visual-spatial ability and cognitive abilities. The WAIS-IV Block-Design subtest uses blocks with red and white triangles and solid red or solid white sides. Different shapes and patterns are presented to the subjects for them to re-create with the blocks under timed conditions. Visual-spatial skills rely on efficient memory, logical reasoning, and the abilities to physically move the blocks in the subtest.

Test-Taking Effort

TOMMs such as the Digit-Span have been used to help accurately determine performance. Cutoff scores are used to determine if a person's results are outside of a statistical norm for persons who were not faking. Score comparison to the known-group not faking is done to see if they are positive for possible malingering (Etherton et al., 2005).

Test taking effort is a factor in testing for malingering. According to O'Bryant, Engel, Kleiner, Vasterling, and Black (2007, p.511), "the identification of insufficient

effort is critical to neuropsychological evaluation." The TOMM is the most commonly used symptom validity test among forensic neuropsychologists and consists of two learning trials followed by a 15-minute delayed retention trial (O'Bryant et al., 2007). Combinations of performance validity measures (PVM) according to Meyers et al. (2014) can show a high reliability for invalidating individual testing measures that alone would be insufficient. This invalidating is done using a chained likelihood ratio method. By combining different (PVM) measures together, you can determine the likelihood that a set of data is invalid.

The clinical utility of using a performance validity test (PVT) was studied by Maricopulos et al. (2014). They found a percentage of false positives (11%) with the use of a PVT. The terms performance validity refers to the validity of test performance (PVT), and symptom validity refers to the validity of symptom report (SVT). These have been suggested to replace less descriptive terms such as effort or response bias (Larrabee, 2012). Although the PVT failure rate was found to be more prevalent in a group with secondary gain (31%), low scores on a PVT without secondary gain can give useful information about test engagement.

Love, Glassmire, Zanolini, and Wolf (2014) studied the specificity and the rates of false-positive scores on the test of memory malingering using the Ray 15-item test (FIT) and the Ray word recognition tests with inpatients that had intellectual disabilities. The FIT had a false-positive rate of 23.8% using a standard cutoff score. The word recognition test in their study yielded a 0.0% false-positive rate using previously reported

cutoff scores. Finally, the TOMM had low false-positive rates around 4.8% and 0.0% on the second trial and on their retention trial. Their study indicated that the FIT had unacceptably high false-positive rates, but it showed that the TOMM and the word recognition tests had low rates.

Classification

Rogers (1990) stated that inclusion criteria for the classification of malingering have to do with our explanatory theories. According to Rogers (1990), the motivation to malinger is either the product of underlying psychopathology or criminal background according to (*DSM,2013)*

According to Greve et al. (2009), chronic pain is frequently accompanied by complaints of cognitive impairment. This cognitive impairment is commonly reported in a context where pain or impairment is compensable. The authors believe that it is important to look at the validity of the reported apparent cognitive difficulties. They used a Criterion Group Validation model in their study to evaluate the classification accuracy of the TOMM. The researchers found that, on average, a simulator was around 1.7 times more likely to fail his test of TOMM compared to a clinically diagnosed malingerer (Greve et al., 2009).

Kirk et al. (2011) studied the phenomenon of suboptimal effort in pediatric populations. They explored the utility of using symptom validity tests in children and adolescents. Their findings showed that 97 out of the 101 tested scored at or above adult cutoff scores suggesting that children perform comparably to adults on the TOMM, and

that it is reasonable to use the test of TOMM, with pediatric populations as young as five years old.

In studying and comparing computerized versus booklet versions of the TOMM for classifying malingerers, differences in performance were compared in college students (Vanderslice–Barr, Miele, Jardin, & McCaffrey, 2011). Data indicated that the two versions yielded equivalent performance. The researchers did state that further studies with different populations were warranted.

The Digit-Span subtest was significantly changed and revised from the previous version. In the WAIS-IV, the Digit-Span subtest was changed with a sequencing trial added; this was done specifically to increase the working memory demanded of those taking the subtest according to Lichtenberger and Kaufman (2012). In a study done by Young, Sawyer, Roper, and Baughman (2012), they tested to see if the operational characteristics of the different tests were equivalent in the newer version. They suggested that the Digit-Span subtest could contribute to detection of less than optimal effort, and they agreed that to classify a person as malingering, additional symptom validity tests should be used, hence the use of multiple tests in the study.

Detection and classification of those with incomplete effort using the WAIS-III Wechsler Adult Intelligence Scale in the study was done by Axelrod, Fictenberg, Millis, and Wertheimer (2006). In their study, they compared patients with mild head trauma to individuals who were referred to them for independent neuropsychological evaluations who had evidence of poor effort. Axelrod et al. (2006) evaluated the Digit-Span forward,

Digit-Span backward, Digit-Span, and the Digit-Span age-corrected digit-span scaled score. In their study, the Digit-Span was found to be the best measure in discriminating for malingerers, but they stated that it is not recommended as a stand-alone validity measure.

In another study, Reese, Suhr, and Riddle (2012) studied the changes in the Wechsler Intelligence Scales Digit-Span subtest for the new WAIS-IV version of the test; they evaluated the predictive accuracy of the existing Digit-Span validity indices and explored whether utilizing the new version would provide further evidence of malingering. The study was done using subjects with mild head injury comparing them with a sample of non-head injury control subjects. In their study, they showed that two potential alternative Digit-Span scores demonstrated superior sensitivity than the traditional older version of the Digit-Span subtest from the WAIS-III.

Manipulation and Coaching

Malingering and coaching for testing is an issue with a number of lawyers and their clients as reflected by a 2004 survey that was sent to members of the National Academy of Neuropsychology and The Association of Trial Lawyers (Victor & Abeles, 2004). It indicated that 75% of the attorneys said they spent 25-60 minutes on average in preparing their clients. The preparation involved giving their clients information about the possible psychological tests they may be taking and how they should respond to those assessments. Forty- four percent of those attorneys who responded to the survey wanted to be aware of the specific tests the psychologists use in assessing their clients, and forty-

eight percent of lawyers believed that their clients should be provided information about the malingering scales.

Interpretation of Findings

The literature search about the subject of malingering and TOMM shows a gap regarding testing with the most current version of the WAIS-IV Digit-Span. The test has changed from the original WAIS-III study. According to Whitney, Shepard, and Davis (2013), the Digit-Span task in the WAIS-IV is significantly different than earlier versions of the measure with the addition of a sequencing component, and further testing with the most current version of the subtests is warranted.

Testing visual-spatial abilities through the use of the Block-Design subtest of the WAIS-IV appears to be a logical expansion of the scope of testing for malingering.

Summary

Malingering is different from factitious disorder because malingering is motivated by external or secondary incentive or secondary gain (*DSM*, 2013). Greve and Bianchini (2004) distinguished between Malingering and Somatization Disorders by stating that malingering is a conscious process, and somatization is an unconscious process. Somatic symptom disorder is different from both malingering and factitious disorders because there is not a conscious intent underlying production of symptoms. The factitious disorders are characterized by intentionally produced or feigned physical or psychological symptoms (*DSM*, 2013). Early instances of malingering go as far back as 760–710 BC, according to Altschuler, Calude, Mead, and Paget (2013). One

characteristic of malingering, according to the (*DSM,* 2013) is that those malingering are doing it for a secondary external gain or incentive.

Malingering patients feigning chronic pain and claiming cognitive disabilities and psychological problems cost a great deal of money and are responsible for significant loss of work time. Malingerers file disability claims totaling more than 20 billion dollars in 2011 (Chafetz & Underhill, 2013). There is a need for a more up to date study using the most current version of the WAIS-IV. The Digit-Span subtest was significantly changed and revised from the previous version in the WAIS-IV with a sequencing trial added.

The theoretical framework of this study was that of a CGV study. Known-groups comparison design which is stronger for external validity according to Liu et al. (2013). CVG is the frame work this study used.

The theory of inquiry into malingering using the CGV conceptual framework is one of a scientific statistical comparison for differences beyond a statistical probability of chance indicating possible malingering. Those with chronic pain complaints of an ambiguous nature related to neurologic injuries who are possibly malingering may also appear to have poor test taking effort (Greiffenstein & Baker, 2006). Classification accuracy for detection of negative response bias criterion is said to be best done by using multiple TOMMs rather than just one assessment instrument (Whitney, Shepard, & Davis, 2013). The most frequently utilized methodologies for malingering research, according to Jasinski, Berry, Shandera, and Clark (2011), include research using

simulation and known-group designs. Test taking effort is a factor in testing for malingering, according to O'Bryant, et al.(2007).

Chapter 3: Research Method

Introduction

The purpose of this study was to evaluate the potential of the Digit-Span and Block-Design subtests of the WAIS-IV for use as a TOMM and SVTs which detect malingering of cognitive pain-related disabilities. The lack of studies using the newest version of the WAIS-IV Digit-Span and Block-Design subtests for malingering represents a gap in the literature that deserved study. According to Whitney et al. (2013), the Digit-Span task in the WAIS-IV differs significantly from earlier versions with the addition of a sequencing component.

This study compares known-group participant conditions to see if there are differences in test scores. The specific comparison of interest was the simulated malingering (faking) group versus the honest group and the laboratory-induced pain group. In previous research with older versions of these tests (e.g. Etherton et al., 2005), the simulated malingering group performed significantly worse than both the honest group and the laboratory-induced pain group.

The Criterion Group Validation (CGV) known-groups were from study participants:

1. G1 (honest) consisted of those who were taking the subtests honestly.
2. G2 (faking) consisted of those who were asked to simulate discomfort and/or a pain-caused impairment that was tied to a secondary motivation of monetary compensation, a simulation of a person who is malingering.

3. G3 (pain) consisted of those who took the tests while experiencing laboratory-induced pain via the CP method

Research Design and Rationale

This study used a within-groups experimental design with the CGV method for a known-group study. The known-groups were to represent the three known-group conditions in the study. Participants were asked to participate in all three groups: G1, G2, and G3. Subtests administrations were counterbalanced with six orders of treatment, with three tests administered to each individual participant. At least two participants were in each of the CGV group conditions.

The administration of the CGV known-group conditions were in the following orders with three participants in each of the six orders:

1,2,3: Honest, Faking, Cold Pressor

1,3,2: Honest, Cold Pressor, Faking

2,3,1: Faking, Cold Pressor, Honest

2,1,3: Faking, Honest, Cold Pressor

3,1,2: Cold Pressor, Honest, Faking

3,2,1: Cold Pressor, Faking , Honest

The rationale for the methods of this study is that the theory of (CGV) has been used in the past for detection of malingering in earlier studies like the Etherton et al. (2005) study using the WAIS-III. Since portions of this study were a partial replication of that study, I chose to use the same (CVG) method as Etherton et al. (2005) in order to see

if the newer versions of the WAIS-IV subtests were still effective in testing for malingering.

Since persons taking the Block-Design subtest use their hands to manipulate the blocks (Wechsler, 2008), the right or left hand preference of the participants was ascertained and the non-preferred hand was submerged into the cold water for the CP pain group condition. If the participant used the non-preferred hand for the moving of the blocks in the Block-Design subtest it could have the possibility of negatively influencing the results by not being as coordinated at arranging the block designs as quickly as their preferred hand. The Block-Design subtest of the WAIS-IV is a timed test (Wechsler, 2008). Performance effort with a participant who has a right hand preference might be hindered if they were forced to use his/her left hand for the completion of the block designs.

Those in the pain group were tested while their hand was submerged in the cold water to simulate pain conditions in the participants. It was not anticipated that the pain group testing would take much longer than the control or faking groups. The pain group was instructed that if needed they could remove their hand from the cold water and start the testing again where they left off when they returned their hand to the cold water. This had the possibility of making their testing take a little more time but it was not anticipated to be a possible confound.

Eighteen participants were utilized for the study testing as a convenience sample of individuals. All eighteen participants were given all three conditions of the testing;

Honest, Faking, and CP Pain conditions, for both the Block-Design and Digit-Span subtests of the WAIS-IV. Testing was done at kitchen tables with the researcher facing the participants and testing administered according to the directions in the WAIS-IV administration and scoring manual.

The CP cold water and ice portion of the testing was done with a cooler containing the cold water placed on a chair beside the participants on the side where their non-preferred hand was so that in that portion of the testing it would be easy for them to submerge their hand in the cold water. All participants in the study were right handed so the cooler was always on their left side. Those that participated in this study all participated in all the three different groups of the study; Honest, Faking, and CP Pain groups. Participants were first read the information in the entrance interview and asked the entrance questions before beginning. They were asked if they had any questions before administration of the study subtests began.. The participants in the CP laboratory induced pain portion of the testing were monitored for excess pain by being asked to rate their pain on a Likert scale of 1 through 10 where one is no pain and ten is the most pain. This was kept track of by the researcher to keep the participants safe from excessive pain but not for any other reason.

The participants were told in the entrance interview that they could withdraw their hand from the cold water in the CP portion of the test for any at any time and that the testing could resume as soon as they were able to put their hand back in the cold water. The CP condition testing did take a minimal amount longer to administer due to stopping

to assess the level of pain and for the participants to withdraw their hand from the 50 to 55 degree water when they needed to. The temperature was maintained at the desired temperature by measuring how hot or cold the temperature was with a digital laser thermometer. If needed additional ice or water was added to the cooler used for testing to maintain the temperature at the desired temperature range. A small Igloo playmate cooler was used to hold the ice and water for the testing because of the convenience of its size for the participants to place their non-preferred hand in while taking the subtests in the CP condition of the testing.

The entrance interview questions were as follows: Are you taking any medications which may hinder your ability participate and to do your best? Are you experiencing any chronic pain? What is your age? Are you right or left handed?

After the testing, participants were asked the questions in the exit interview to see if they felt that they were able to participate to the best of their abilities and if they had any questions about the testing. There was not any remuneration for the testing and it was strictly voluntary for participation in the study. Exit interview questions were as follows: Were you able to participate to the best of your abilities? Do you have any questions?"

Study Variables

1. The dependent variables were the participants' group scores on the Digit-Span and Block-Design subtests of the WAIS- IV.

2. The independent variable was the testing condition: honest, laboratory-induced pain, or malingering.

3. Self-reported amount of pain from participants in the CP pain group was measured with a Likert scale from 1 to 10 with ten being the most extreme pain and one being the least amount of pain (qualitative dependent variable). This variable was used for identification of those who were overly sensitive to the induced pain. Their condition was monitored by the researcher so their safety could be ascertained and so that they could be removed from the study if they were having excessive pain from the cold pressor induced pain situation.

Research Questions and Hypotheses

RQ1: Quantitative: Will there be differences in scores among the three group conditions on the Digit-Span subtest?

*H*10There will be no difference in scores among the three group conditions on the Digit-Span subtest.

*H*1A: Group condition 1 participants will perform better than group condition 2 participants on the Digit-Span subtest.

*H*1B: Group condition 1 participants will perform better than group condition 3 participants on the Digit-Span subtest.

*H*1C: Group 2 will perform better than group condition 3 on the Digit-Span subtest.

*H*1D: Group 2 will perform better than group condition 1 on the Digit-Span subtest.

*H*1E: Group 3 will perform better than group condition 1 on the Digit-Span subtest

*H*1F: Group 3 will perform better than group condition 2 on the Digit-Span subtest

RQ2: Will there be differences among the three group conditions' participants on the Block-Design subtest?

*H*20There will be no difference in scores among the three group conditions on the Block-Design subtest

*H*2A: Group condition 1 participants will perform better than group condition 2 participants on the Block-Design subtest.

*H*2B: Group condition 1 participants will perform better than group condition 3 participants on the Block-Design subtest.

*H*2C: Group 2 will perform better than group condition 3 on the Block-Design subtest.

*H*2D: Group 2 will perform better than group condition 1 on the Block-Design subtest.

*H*2E: Group 3 will perform better than group condition 1 on the Block-Design subtest.

*H*2F: Group 3 will perform better than group condition 2 on the Block-Design subtest.

Methodology

Population

The population of interest was healthy individuals between the ages of 18 and 90 who were volunteers and were willing to participate in the study. A total of eighteen participants volunteered to participate. They were asked if they were willing to participate in all three conditions of the testing. All were willing and all 18 participated in all of the testing conditions. Criteria for participation were primarily age range and willingness to participate. No exclusions were made from the convenience sample of volunteers that were willing to participate.

b. Sampling

Sampling occurred by inviting individuals to participate in the study as described in section d below. The participants all participated in groups representing the three known-group conditions of this study. The sample consisted of both male and female participants of various ages within the sample groups who were volunteers. The testing took place on different days due to availability of participants and scheduling for researcher and participants. Information was taken about the ages and gender of the individuals, but the demographic of age and gender were not being measured as a part of this study and was only used in scoring to get a scaled score for comparison.

c. Sampling Procedures

The study was a partial replication of the Etherton et al. (2005) study which used an older version of the WAIS-III Intelligence Scales subtests. It used the Criterion Group Validation method of study. To be more comparable to the earlier study results, this study used the same methodology and sampling procedures as the earlier Etherton et al. (2005) study. The same Criterion Group Validation methodology was used to see if the newer WAIS-IV subtests were still a viable way to determine possible malingering.

Testing time and resource constraints were based on the availability of participants, researcher, and availability of cold water and ice for use in the CP pain group portion of the study. Testing materials such as the individual subtests of the WAIS-IV testing booklets and scoring materials were limited. This shortage of testing instruments was a constraint on time available for testing.

d. Procedures for Recruitment, Participation, and Data Collection

Participants were invited to participate and volunteer through researcher's word of mouth asking for volunteers from friends, associates, family, etc. Inclusion and exclusion criteria for the study consisted of those who were not experiencing chronic pain with exclusion done by a self-report of chronic pain in the study entrance interview. Those who were unable to perform to the best of their abilities were excluded from the study. Full disclosure of the different criterion groups' requirements during testing was made known to the participants before testing, and the option to opt out at any time from the testing was communicated as well. No medical condition information or medication information was asked for, only a self-report of the participant's belief that they might

have difficulty doing their best on the subtests because of their medications or physical condition.

Approval for this study was obtained from the Institutional Review Board (IRB) of Walden University with approval number 09-08-15-0060639 which expires September 7, 2016. Written informed consent (Appendix A) was received from all participants in the study informing them of their right to stop the participation in the study at any time and that the results of their subtest would remain in confidence and not connected with their name, but they were assigned a number identifier and their name was kept confidential. Some participants from the original version of the study were used in the revised version of the study but they were counterbalanced in the administration of their subtests, this done to balance the different orders of administration possible, 3 participants in each possible order of administration. The Original version of this study was a between-groups study. The IRB was petitioned to approve the final study as a within-groups study with a larger group size from the original study, with N=18 who participated in all three conditions of the final testing.

Upon arrival at the testing site, participants were informed that they would participating in all three testing conditions if they desired, one of which would involve mild-to-moderate clinically-induced pain by use of the CP method of submerging their non-preferred hand in cold water to simulate pain symptoms. All participants elected to participate in all three groups. The participants were informed that they could refuse to participate in the study if they did not wish to experience such a procedure. The

participants in the study read and signed an informed consent document (See Appendix A) which fully described the study and the three conditions of the study that they were participating in.

Each of the participants were personally interviewed before testing to see if he or she had issues such as chronic pain which might limit their ability to apply their best efforts to complete the required tests.

This current study, like the previous study done by Etherton (Etherton, 2005), used Criterion Group Validation "known-group" design (Greve & Bianchini, 2004). This study used Roger's (2008) criteria to determine an acceptable range of cutoff scores in those experiencing pain while undergoing the psychological evaluation.

Three Known-Group Conditions of the Study

The G1 group who was instructed to complete the Digit-Span and Block-Design subtests to the best of their ability. The G2were asked to fake cognitive difficulties based on pain that was being feigned. The G3 CP group chosen to undergo laboratory-induced pain by submersing their hand in water that was 45°-55° degrees and were asked to keep their hand in the cold water immediately prior to and during the administration of the subtests. More specific description of this condition is presented in Appendix D.

The participants in the CP pain group were informed that they could remove their hand from the water if the pain and discomfort became too great. If they did, they were told to replace their hand in the water as they were able to do so if they wished to proceed with the testing. Participants in all groups were informed that they could withdraw at any

time for any reason. Like the Etherton et al. (2005) study, the participants in group 3 were asked to rate their pain levels on a Likert scale measuring pain intensity, with 1 (*no pain*), 2 to 3 (*mild pain*) , (*moderate pain)* 4 to 6, (*severe pain*) 7 to 9, and (*very severe pain*) a level 10 on the scale. The collection of this data was to have a safety check for the researcher to make sure the participants were not overly sensitive to or harmed by the cold pressor method of pain simulation. The temperature of the water was measured every 5 minutes or less with a digital infrared thermometer and the temperature maintained near 45°-55° F so as to simulate mild-to-moderate pain but not injure the participants through excessively cold exposure. Pain measures were measured at 1–2-minute intervals using a Likert type scale. Participants were given verbal and written instructions that they could stop participation at any time if desired. The testing was done while the participants submersed their hand in the cold water to simulate pain and discomfort conditions while being tested.

The results of the testing were analyzed using a repeated measures analysis of variance (ANOVA) and subsequent means testing using the Bonferroni test. All statistical tests were conducted at an alpha level of 0.05. It was assumed that the participants were participating to the best of their abilities. Pre and post test questions asked to see if the participants felt that they were doing their best but no way to prove other than a self-report was used.

The simulated malingering group, (G2), was the group instructed to fake pain-related memory impairment prior to the administration of the tests. They were asked to

read the same instructions as used in the Etherton et al. (2005) study of the Digit-Span and word memory subtest portions of their study using the earlier subtests of the WAIS-III. Those instructions are provided in Appendix E.

The key issue is primary or secondary gain in distinguishing if a person is malingering and their effort in taking the test to the best of their abilities. False positives for effort increase significantly as the number of indicators that are used is increased (Berthelson, Mulchan, Odland, Miller, & Mittenberg, 2013). This study was based on the results of three known-groups, and the participants were asked in the pre-and post-test interviews if they were able to take the tests to the best of their abilities. This confronting the participants with the importance of sufficient effort before and after the testing was intended to keep the validity of the testing performance of the participants valid (Suchy, Chelune, Franchow, & Thorgusen, 2012).

This study was a purely quantitative study. The study used statistical analysis of the results of the scaled scores to identify possible malingering scores in differences within/between the three known-groups' scaled scores. The role of the researcher in the data collection procedure was that of an administrator and data analyzer. The testing was done by the researcher. The initial objective of the study was to test scaled group scores for suspected malingering in those who were in the group intentionally feigning cognitive disability to get secondary gain against the scaled scores of the other two known-groups. This faking group was feigning cognitive disabilities but trying not to fake too badly so as to be detected and lose their secondary gain. The scaled scores of those in the faking

group were compared with the normal group and the CP group for any differences. The information added to the results from earlier studies (Etherton et al., 2005) where they used an earlier version of the same intelligence scale (the Digit-Span and Word Memory subtests of the WAIS III). This study added the Block-Design subtest as an additional TOMM to test for visual-spatial abilities. Visual-spatial abilities in the Block-Design subtest use a number of different cognitive abilities to re-create what is seen visually with the blocks.

Participants were given both an entrance and exit interview to ascertain information about chronic pain conditions as well as their ability to perform well on the tests, as effort is a variable that would affect testing outcome (Suchy et al., 2012). Similarly, the use of medications may affect performance on the tests.so participants were asked if they were taking any medications that they thought would make it so that they would not be able to participate to the best of their abilities. The informed consent document is included in Appendix A.

Threats to Validity

a. Test taking effort

Test taking effort on the part of the participants affects their performance. Test taking effort is a factor in testing for malingering. According to O'Bryant, Engel, Kleiner, Vasterling, and Black (2007, p.511), "the identification of insufficient effort is critical to neuropsychological evaluation." If there is insufficient effort, there is a higher possibility of getting a false positive for a malingering individual due to lower than

chance scores from not putting enough effort into the testing. This is why a questionnaire both pre- and post-testing about completing the tests to the best of the participant's abilities is important to screen for insufficient effort on the part of the study participants.

b. Coaching of participants

The coaching or manipulation of participants could possibly influence their test validity. The researcher both administered the tests and the researcher scored the results to minimize the chances of coaching or manipulation by others.

c. Pre-existing health or pain related conditions of participants

Chronic pain conditions could skew the results and decrease the validity of the testing, so those with chronic pain issues were to be screened from the study. The presence of pathology in participants can be a threat to validity, and this study assumed an absence of pathology to malinger in the participants.

Criterion group validation (CVG) measures each participant's status with regards to absence or presence of pathology. Criterion group validation looks for a true positive or a false positive for pathology of malingering. According to Frederick (2000), the probability that a participant will earn a positive score in the absence of pathology is the "false positive rate". Researchers attempt to establish cutoff scores that clearly reveal true positive scores and minimize false-positive scores according to Frederick (2000).

For the known-group Criterion group validation of this study, those who were actually experiencing cold pressor induced pain and the group taking the subtests

honestly were expected to be those with a false-positive score, and those purposely faking to have cognitive difficulties were those with a true-positive score for malingering.

For the validity of this study, it required a confidence in the lack of pathology in the participants for malingering for the different known-groups to be valid.

Where the research was conducted

The research was conducted in Mesa, Arizona near and in the researcher's residence.

Summary

This quantitative study was to evaluate the potential of the Block-Design and Digit-Span subtests of the WAIS-IV to detect malingering. The study was approved by the Institutional Review Board (IRB) of Walden University to do a within-subjects design, where all participants participated in all three group conditions of the study. This differed from the originally proposed study which was a between groups design, so additional approval of the IRB was sought and received. Both the study type and number of participants for statistical power were changed and approved by the IRB. Participants in condition one were instructed to perform the tests to the best of their abilities. Participants in condition two were instructed to fake pain-related cognitive impairment (). Participants in condition three took the tests while experiencing laboratory-induced pain via the cold pressor method.

Based on previous research participants in G2 should have demonstrated impaired performance compared to the other two conditions, and they did. The research study was

a partial replication and expansion of a study done by who used the WAIS-III for their study. This study used the revised versions of the WAIS-IV Digit-Span with its sequencing component added and the Block-Design not previously used. It expands upon the previous research by adding additional tests for malingering. Specifically, it used the Block-Design subtest of the WAIS-IV.

Chapter 4: Results

Introduction

The purpose of the study was to evaluate the efficacy of the Digit-Span subtest and the Block-Design subtest of the WAIS-IV (Wechsler, 2008) for use as a TOMM. The study partially replicated an earlier study done by Etherton et al. (2005) who used an earlier version the WAIS- III Digit-Span subtest alone in their effort to identify a TOMM. The current study also used the Digit-Span subtest of the WAIS-IV with its new sequencing component not available in the WAIS-III Digit-Span test. It also added the Block-Design subtest with blocks that are manipulated to represent what is seen by the participants. The Block-Design evaluates more of the visual-spatial functions in processing visual memory and logical reasoning abilities. For simplicity and clarity, the following terminology was used for the research questions and hypotheses:

G1: (those taking the subtests honestly).

G2: (those simulating malingering).

G3: (those experiencing pain and discomfort through the CP technique).

Chapter 4 presents a description of each of the three groups of the study, the research questions and hypotheses, the results of the study testing, the procedures used to test participants in tables that represent the data from the study statistics, and a brief description of each table and what it represents.

Research Questions and Hypotheses

RQ1: Quantitative: Will there be differences in scores among the three group conditions on the Digit-Span subtest?

*H*10There will be no difference in scores among the three group conditions on the Digit-Span subtest.

*H*1A: Group condition 1 participants will perform better than group condition 2 participants on the Digit-Span subtest.

*H*1B: Group condition 1 participants will perform better than group condition 3 participants on the Digit-Span subtest.

*H*1C: Group 2 will perform better than group condition 3 on the Digit-Span subtest.

*H*1D: Group 2 will perform better than group condition 1 on the Digit-Span subtest.

*H*1E: Group 3 will perform better than group condition 1 on the Digit-Span subtest

*H*1F: Group 3 will perform better than group condition 2 on the Digit-Span subtest

RQ2: Will there be differences among the three group conditions' participants on the Block-Design subtest?

*H*20There will be no difference in scores among the three group conditions on the Block-Design subtest

*H*2A: Group condition 1 participants will perform better than group condition 2 participants on the Block-Design subtest.

*H*2B: Group condition 1 participants will perform better than group condition 3 participants on the Block-Design subtest.

*H*2C: Group 2 will perform better than group condition 3 on the Block-Design subtest.

*H*2D: Group 2 will perform better than group condition 1 on the Block-Design subtest.

*H*2E: Group 3 will perform better than group condition 1 on the Block-Design subtest.

*H*2F: Group 3 will perform better than group condition 2 on the Block-Design subtest.

Data Collection

Recruitment and data collection began March 18, 2016—the day after IRB approval was obtained—and continued until March 29, 2016. I recruited participants in person and over the telephone. Some responded via text messaging to set up appointments to do the testing within their personal schedules. The response rate was better for female participants than males. The male participants were all tested in the evening except for one who had a day off from work.

Out of more than 50 asked to participate 18 were willing to participate in the study. The researcher's committee member in the Oral Defense for the proposal of the

study suggested the use of the same individuals in all three group conditions of the study. A within-subjects design and the suggestion of using them for all three conditions was used for the current study for the three group conditions. The sample was a convenience sample of those who were willing to participate. Possible effects of repetition for the participants were minimal as the conditions of the testing were different for each group condition, and different subtests were counterbalanced and given alternatively.

The sample was not representative of the population at large due to fewer male participants. Future research should try to have a more representative more balanced sample. Both male and female participants were equally sought after and both couples and individuals were asked to participate, but more of the wives of the couples asked were available. Perhaps there were more female participants due to the fact that most of the testing was done during daytime work hours while most husbands were at work..

The sample was a convenience volunteer sample. A total of 18 participants were recruited (13 females, 5 males). The female participants of the study were from the age of 18 through 66, and all were in good health with no chronic pain issues, and all were right handed. The male participants were from age 18 through 52 and all were in good health with no chronic pain issues, and all were right handed.

With *N*=18 participants, the total number of scores across groups was 54, *N*=18 participants, times 3 groups, which equals 54 scores).for each subtest The sample of participants was representative of those who were willing and able to participate in the three different groups. No particular group was sought out more than any other. The tests

were administered in a counterbalanced order to each participant for a total of three tests for each condition, Block-Design and Digit-Span, for a total of 6 tests per participant three for Block-Design, and three for Digit-Span. The testing was done indoors rather than in the trailer mentioned in chapter three due to the hot weather and rain conditions from the local monsoon season weather patterns. All testing was done within a 3-mile radius of the principal researcher's residence in Mesa, Arizona. The testing instrument subtests, Block-Design and Digit-Span, were all administered according to the WAIS-IV administration and scoring manual instructions. The test administrator sat on one side of the table facing the participants, and the tests were administered within a 30–45-minute time frame. Each subtest took from 10 to 15 minutes to administer. There were no adverse events during testing.

Results

Results of the three groups on their tests were scored with the scoring guidelines found in the WAIS-IV administration and scoring manual. Scoring was done by converting the participants' raw scores into scaled scores. Conversion was based on the age of the participants and their gender, comparing their raw scores to the norms and conversion tables in Appendix A of the WAIS-IV scoring manual.

Assumptions for inferential statistics used were based on the partial replication of the Etherton et al. (2005) study where they used ANOVA analysis of variance to determine if there was a statistical difference between the subjects in their study groups. The Bonferroni pairwise comparison test was suggested by the dissertation committee as

a statistical measure for this study to further determine if there was a statistical significance between group scores. The group size determined by the type of study (Within Subjects/Groups) with the Q-Data program to find the correct size group for the desired effect size for the statistical desired power to be at an alpha level of .05.

The scaled scores of the participants on both the Block-Design and Digit-Span subtests were then entered into the SPSS program, version 21, for each of the different groups of the study for ANOVA comparisons of group scores. Repeated measures ANOVAs were applied to the scaled scores using an alpha level of .05. Significant overall tests were further examined using Bonferroni pairwise comparisons to counteract for multiple comparisons of groups used in the study simultaneously to infer an outcome of whether there was a group showing that they were faking with any statistical significance. The significance level in table three was 1.0 for Digit-Span and in table six for the Block-Design test a significance level of .201.

Table 1 presents descriptive statistics for the Block-Design subtest. A repeated measure ANOVA revealed a significant effect for treatment (see Table 4) with a Cohen's d: 1.498 between G1 and G2 this was based on the average SD from two means. Cohen's *d*: -1.982 between G2 and G3, this was also based on the average SD from two means.

Subsequent pairwise comparisons using the Bonferroni correction revealed that participants in Group 2 scored significantly lower than participants in both Group 1 and Group 3 (see Table 3).

The answer to RQ1 was yes. There were treatment effects on the Block-Design subtest. Specifically, participants in the faking group performed poorer than those taking the test normally or those taking the test while experiencing laboratory-induced pain and discomfort. There was no difference between those taking the test normally and those taking the test while experiencing laboratory-induced pain and discomfort.

Table 4 presents descriptive statistics for the Digit-Span Subtest. Repeated measures ANOVA revealed a significant effect for treatment (see Table 5). Subsequent pairwise comparisons using the Bonferroni correction revealed that participants in Group 2 scored significantly lower than participants in both Group 1 and Group 3 (see Table 6). Between group 1 and group 2 The Cohen's *d*: 2.975, this was based on the average SD from the two means. Between groups 2 and 3 the Cohen's *d:* -2.8254 this was also based on the average SD from the two means

The answer to RQ 2 was yes. There were treatment effects on the Digit-Span subtest. Specifically, participants in the faking group performed poorer than those taking the test normally or those taking the test while experiencing laboratory-induced pain and discomfort. There was no difference within/between those taking the test normally and those taking the test while experiencing laboratory-induced pain and discomfort.

Summary

The answer to RQ1 is accepted; there was a statistically significant difference among the treatment conditions for the Digit Span Subtest.

Table 1

Descriptive Statistics for Digit-Span Subtest

	Participants	Mean scores	Standard deviation	Minimum score	Maximum score
Group 1 Digit-Span	*N* = 18	10.667	2.67711	6.00	15.00
Group 2 Digit-Span	*N* = 18	3.833	1.91767	1.00	8.00
Group 3 Digit-Span	*N* = 18	10.778	2.99955	6.00	16.00

In Table 1; Groups 1(Honest control group condition) and 3 (Cold Pressor Pain Group Condition) were less than one mean score points apart while the mean score of group 2 (Faking Group Condition) was nearly 7 points below the other two scores. Standard deviation also shows a similar difference as well as minimum scores and maximum scores.

Table 2

Overall ANOVA for Digit-Span Subtest: Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		*Type III sum of squares*	*df*	*Mean square*	*F*	*Sig*
Treatment	Sphericity Assumed	326.926	2	163.463	38.845	.000
	Greenhouse-Geisser	326.926	1.749	186.909	38.845	.000
	Huynh-Feldt	326.926	1.933	169.105	38.845	.000
	Lower-bound	326.926	1.000	326.926	38.845	.000
Error(treatment)	Sphericity Assumed	143.074	34	4.208		
	Greenhouse-Geisser	143.074	29.735	4.812		
	Huynh-Feldt	143.074	32.866	4.353		
	Lower-bound	143.074	17.000	8.416		

Table 3

Pairwise Comparisons for Digit-Span Subtest

Measure: MEASURE_1

(I) Treatment	(J) Treatment	*Mean difference* (I-J)	*Std. error*	*Sig.*	95% *Confidence Interval for Difference*	
					Lower bound	Upper bound
1	2	6.833*	.584	.000	5.282	8.385
	3	-.111	.449	1.000	-1.304	1.082
2	1	-6.833*	.584	.000	-8.385	-5.282
	3	-6.944*	.688	.000	-8.772	-5.117
3	1	.111	.449	1.000	-1.082	1.304
	2	6.944*	.688	.000	5.117	8.772

Pairwise comparison done in Table 3 shows that the mean difference in Group 2 (Faking group condition) is significant at the 0.005 level

Thus, the null hypothesis is rejected. Specifically, Group 2 performed worse that both Group 1 and Group 3. This provides support for alternative hypotheses 1a and 1b. There was no difference between the performance of Group 1 and Group 3.

The answer to RQ2 is accepted; there was a statistically significant difference among the treatment conditions for the Block Design Subtest.

Table 4

Descriptive Statistics for Block-Design Subtest

	Participants	*Mean scores*	*Standard deviation*	*Minimum score*	*Maximum score*
Group 1 Block-Design	*N* = 18	11.6667	3.44708	6.00	18.00
Group 2 Block-Design	*N* = 18	7.0556	2.71103	1.00	13.00
Group 3 Block-Design	*N* = 18	12.7222	3.00599	7.00	19.00

In Table 4; G1and G3were only one to two means score points apart while the mean score of G2 was nearly six points below the other two scores. Standard deviation also shows a similar difference as well as minimum scores and maximum scores.

Table 5

Overall ANOVA for Block-Design Subtest: Tests of Within-Subjects Effects
Measure: MEASURE_1

Source		*Type III sum of squares*	*df*	*Mean Square*	*F*	*Sig*
Treatment	Sphericity Assumed	569.593	2	284.796	93.339	.000
	Greenhouse-Geisser	569.593	1.647	345.823	93.339	.000
	Huynh-Feldt	569.593	1.801	316.305	93.339	.000
	Lower-bound	569.593	1.000	569.593	93.339	.000
Error(treatment)	Sphericity Assumed	103.741	34	3.051		
	Greenhouse-Geisser	103.741	28.00	3.705		
	Huynh-Feldt	103.741	30.613	3.389		
	Lower-bound	103.741	17.000	6.102		

There are differences in Table 5 between the Type III Sum of Squares in both the Treatment and Error (treatment). There are also differences in the Mean Square and the degree of freedom (df).

Table 6

Pairwise comparisons for Block-Design Subtest
Measure: MEASURE_1

(I) treatment	(J) treatment	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	4.611*	.750	.000	2.619	6.603
	3	-1.056	.539	.201	-2.487	.376
2	1	-4.611*	.750	.000	-6.603	-2.619
	3	-5.667*	.741	.000	-7.634	-3.699
3	1	1.056	.539	.201	-.376	2.487
	2	5.667*	.741	.000	3.699	7.634

* The mean difference is significant at the 0.005 level.

b. Adjustment for multiple comparisons: Bonferroni.

Thus, the null hypothesis is rejected. Specifically, G2 performed worse than both G1 and G3. This provides support for alternative hypotheses *H*1A and *H*1B they are both accepted. There was no difference between the performance of G1 and G3.

Pairwise comparison done in Table 6 shows that the mean difference in G2 (Faking group condition) is significant at the 0.005 level.

The results of both the Digit-Span subtest results and the Block-Design subtest are similar. G2 was significant at the 0.005 level in both subtests scores

About Cohen' d: A commonly used interpretation is to refer to effect sizes as small (d = 0.2), medium (d = 0.5), and large (d = 0.8) based on benchmarks suggested by

Cohen (1988). The results of this study effect size was more than 2.0 in both Digit-Span and Block-Design groups results signifying a large effect size in the study data between the group conditions of honest and CP groups and the faking malingering groups.

This study was a partial replication study of the study done by Etherton et al. (2005) where they used an earlier version of the WAIS-III Digit-Span subtest. This study showed that the Digit-Span subtest of the WAIS-IV remains a viable test of mental malingering and it adds the similar results of the Block-Design subtest of the WAIS-IV as well as the revised version of the Digit-Span subtest with its addition of a sequencing component

Chapter 5:

Introduction

The purpose of this study was to detect malingerers using the Digit-Span and Block-Design subtests of the WAIS-IV adult intelligence scales.

APA requires that the most current tests available be used. This constitutes an ethical standard according to Ethical code of conduct, APA Ethical Principles of Psychologists and Code of Conduct section 2.07 (DSM,2013). WAIS-IV, the test used in this study, is the most current version

The theoretical framework of this study was that of a (CGV) within group study. Known-group comparison design is stronger for external validity according to Liu et al. (2013). The addition of the Block-Design subtest in this study was done to test for better external validity by comparing its results with the Digit-Span.

The study was a within-group known-group design with a control group doing the tests normally and honestly, a faking group, and a cold pressor pain group. The CP group G3 experienced laboratory-induced pain symptoms while trying to take the tests honestly by immersing their hands in 45- to 55-degree water while taking the subtests. This CP method of pain induction is a standard technique of inducing pain (Grasley, 1989; Peckerman et al. 1991; Rainville et al., 1992).

The nature of the study was experimental and quantitative. Use of the SPSS program was done to compute means and conduct ANOVA testing for comparison of the means of the scaled scores. The key findings of the study are that there were statistical

differences in the mean scaled scores of the groups. The faking group was consistently lower in score than the control and CP pain groups.

The study was a partial replication of the Etherton et al. (2005) study which used an older version of the WAIS-III intelligence scales subtests. It used the same Criterion Group Validation method of study. CGV is a method of finding positive and false positive rates for tests and diagnostic scores (Greve & Bianchini, 2004; Frederick 2000; Roscoe, 1975). It requires that the researcher have confidence about the presence or absence of pathology in every participant used in the study indicating poorer performance on the subtests.

Since this study was for the detection of malingering, the known-groups in this study were presumed to be absent pathology of malingering. Study participants were a convenience sample who were asked to participate and were willing to take part in the study. Results of this study were similar to the Etherton et al. (2005) study where the data provides sufficient evidence to conclude that the test instruments were viable for use as TOMMs like the earlier study. The unique contribution of the present study was using the most recent version of the WAIS and including the Block-Design subtest along with the Digit-Span subtest thus filling a gap in the literature on TOMMS.

Interpretation of the Findings

The study was a partial replication study of the study done by Etherton et al. (2005) where they used an earlier version of the WAIS-III Digit-Span subtest. This study showed that the Digit-Span subtest of the WAIS-IV remains a viable TOMM even with the added sequencing portion of the subtest. This is an important finding because the APA Code of Ethics requires that the most current versions of instruments be used (APA, 2002; section 2.07)

The present study also added knowledge to the discipline in adding the Block-Design subtest as an additional measure for the detection of malingering. The results of the Block-Design test were similar to the results of the Digit-Span subtest and adds another TOMM for use to detect those faking cognitive difficulties based on pain symptoms. The faking group performed significantly poorer than both of the other two CGV known-groups, (normal and pain induced). Thus, the present study replicated the results of the Etherton et al. (2005) study and showed that the Digit-Span adding Block-Design subtests are both effective means to detect possible malingering. This new finding of the value of the Block-Design subtest adds another tool in efforts to detect malingering.

Limitations of the Study

The limitations were as anticipated. Limitations of the study were test taking effort which could not be measured other than through use of a self-report question asked in both entrance and exit interviews. Test taking effort is a factor in testing for

malingering. According to O'Bryant et al. (2007, p. 511), “The identification of insufficient effort is critical to neuropsychological evaluation. The test of mental malingering is the most commonly used symptom validity test among forensic neuropsychologists consisting of two learning trials followed by a 15-minute delayed retention trial.” Combinations of performance validity measures (PVM) according to Meyers et al. (2014) can show a high reliability for invalidating individual testing measures that alone would be insufficient.

The participants’ health and level of cognitive abilities could not be measured except through self-report. Confronting the participants with the importance of sufficient effort before and after the testing was intended to keep the validity of the testing performance of the participants valid (Suchy et al. 2012).

In both the entrance and exit interview, the participants were asked if they felt there would be any reason they could not participate to the best of their abilities. Participating in the testing honestly was stressed, except for those who were faking to have cognitive abilities and purposely trying to malinger

No new issues arose in execution of the study. Because there were more female than male participants, the population at large may not have been represented. However, no previous research could be found that there are gender differences in these sorts of tests for malingering.

Recommendations

Recommendations for further research based on this study would be to replicate the study with more participants and more male participants to increase the generalizability and validity. Of the study participants, there did not appear to be much difference between male and female participants' scores. Both males and females in the CP condition who were experiencing induced mild to moderate pain, stated that the pain of having their hand submersed in the cold water seemed to lessen as they became acclimated to the cold water. In fact, when comparing individual participant's personal scores, some even did better at the testing in the CP condition of the testing which was interesting, as the expectation was that the CP group who were really having pain induced would score lower than the group taking the test honestly.

Also, a more gender-balanced sample would permit an examination of possible gender differences. Some participants seemed to become more comfortable over time in the CP cold pressor group condition with their hand in the cold water and some did just the opposite. It would be interesting to study if there was some gender-based pain tolerance or sensitivity to the cold pain condition.

Most of the women participants were more comfortable in the cold water with very few exceptions. Those with the water at or around 50°seemed to experience more effects from the cold water, and with just a small increase in temperature, others were able to proceed with testing without removing their hand from the water. The water was

kept between 45 and 55 ° in temperature and checked often with the digital infrared thermometer to make sure it stayed within that range. Coldest temperature was measured at 48 degrees for one of the male participants, and he said it was a very good simulation of a person with pain issues. One possible drawback in the Block-Design portion of the test was noticed and commented on by participants in that it was harder for them in the CP group to manipulate the blocks because in the other two conditions they were able to use both hands to manipulate the blocks but in the CP group they were only able to use their preferred hand to manipulate the blocks to replicate the pictures in the test booklet of the Block-Design. For future research, participants in the honest and faking conditions should be restricted to using only one hand to manipulate the blocks as is the case for those in the CP condition.

Perhaps other tests could be combined in future research to reinforce the significance of this study such as the Wechsler Memory Scales, or the MMPI-2. The validity scales of the MMPI-2, specifically the F-scale score, can discriminate between those who are malingering and those who are not.

Implications

The potential positive social change contribution of this study is that it updates and expands the range of options that can be used for testing for mental malingering. Better testing has the potential to reduce costs from those malingering which are estimated at 20.02 billion dollars for adult disability claimants alone in 2011, according to Chafetz and Underhill (2013).

Additional information from the use of the Block-Design subtest adds more information about cognitive abilities and visual-spatial abilities to use in addition to older measures of the WAIS-III Digit-Span subtests used in the past to help detect malingering. This study adds to the discipline by use of the most current WAIS-IV Digit-Span subtest with its added sequencing component that was unavailable for the previous study (Etherton et al., 2005) done with the earlier version of the test.

Finally the addition of the Block-Design subtest to test for visual-spatial abilities as a TOMM adds to the discipline another test.

On an individual level, the implications and impact of this testing are similar to the implications for the family, organizations, and societal implications in that finding fast, cost effective, and reliable ways to detect those who are faking cognitive disability for secondary gain has an effect on insurance rates and costs to individuals, family and society.

The raw data will be stored securely in the researchers safe and in digital form encrypted and password protected on digital storage media. Each participant was assigned a number to identify them and their names are to be kept in the researchers safe and digital media storage encrypted and password protected on the consent form they signed to participate in the study. This done to keep the participants names confidential from all but the researcher and his dissertation chair.

Conclusion

Malingering is a burden on us all through the costs to society of those faking disability to achieve monetary gain. Chafetz and Underhill (2013) stated that the figure is 20.02 billion dollars for adult disability claimants in 2011. Tests like the Digit-Span and the Block-Design subtest of the WAIS-IV provide fast, cost-effective and reliable ways to help detect possible malingerers and potentially reduce societal costs.

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APPENDIX A

APPENDIX A: Normal Control (Group 1) Instructions

This group took the Digit-Span and the Block-Design subtests of the WAIS-IV intelligence scales (Wechsler, 2008) in a honest fashion to the best of their abilities. The participants could withdraw from the study at any time for any reason. There was no remuneration for participation in the study. The results of the study made available to the participants upon their request when available.

The confidentiality of participants was maintained by assigning the participants a number rather than using their names to be identified in the study. Participants were asked to participate in the three groups of the study, which includes:

1. The normal control group who took Digit-Span and Block-Design subtest in an honest manner to the best of their abilities.
2. The malingering faking group who took the Digit-Span and Block-Design subtest while being asked to fake cognitive difficulties allegedly caused by pain, with the following explanation:

   Faking group explanation," Imagine that you have been in an accident and suffered an injury to your neck and shoulder. Initially you experience pain in that arm and hand, but now you're completely healed and experiencing no problems. Nevertheless, you have filed a lawsuit and you stand to gain a very large settlement if you are disabled. In your lawsuit, you are claiming that your pain has affected your ability to think, especially your memory. Because of the memory problems you have developed, you cannot do college-

level work, and now your future employment opportunities are limited. You have been sent to a psychologist to evaluate your claim of memory problems and are now about to take a memory test for that purpose. Your task is to perform on that test as if your memory was impaired because of severe, persistent, chronic pain, however, you must fake your memory impairment in a way that is believable because if you are caught, your lawsuit will be thrown out of court and you will get nothing" (Etherton et al., 2005, p. 378-379).

3. The cold pressor pain group who took Digit-Span and Block-Design subtest in an honest manner to the best of their abilities while being subject to having their forearm submerged in cold water to induce mild to moderate pain and discomfort.

Before and after the testing, participants were asked if there was any reason they were not able to take the test to the best of their ability. The participants were not asked any health related question only if they believe there was anything that would impede their ability to participate and do their best.

Appendix B:

Malingering/Faking (Group 2) instruction

1. Malingering/faking group were asked to fake cognitive difficulties caused by pain with the following explanation: ” Imagine that you have been in an accident and suffered an injury to your neck and shoulder. Initially you experience pain in that arm and hand, but now you're completely healed and experiencing no problems. Nevertheless, you have filed a lawsuit and you stand to gain a very large settlement if you are disabled. In your lawsuit, you are claiming that your pain has affected your ability to think, especially your memory. Because of the memory problems you have developed, you cannot do college-level work, and now your future employment opportunities are limited. You have been sent to a psychologist to evaluate your claim of memory problems and are now about to take a memory test for that purpose. Your task is to perform on that test as if your memory was impaired because of severe, persistent, chronic pain, however, you must fake your memory impairment in a way that is believable because if you are caught, your lawsuit will be thrown out of court and you will get nothing” (Etherton et al., 2005, p. 378-379).

The participants could withdraw from the study at any time for any reason. There was no remuneration for participation in the study. The results of the study made available to the participants upon their request when available.

The confidentiality of participants was maintained by assigning the participants a number rather than using their names on data forms. Participants were asked to participate in the three groups of the study which included:

1. The normal control group who took Digit-Span and Block-Design subtest in an honest manner to the best of their abilities.

2. The malingering faking group who took the Digit-Span and Block-Design subtest while being asked to fake cognitive difficulties allegedly caused by pain, the following explanation:

"Imagine that you have been in an accident and suffered an injury to your neck and shoulder. Initially you experience pain in that arm and hand, but now you're completely healed and experiencing no problems. Nevertheless, you have filed a lawsuit and you stand to gain a very large settlement if you are disabled. In your lawsuit, you are claiming that your pain has affected your ability to think, especially your memory. Because of the memory problems you have developed, you cannot do college-level work, and now your future employment opportunities are limited. You have been sent to a psychologist to evaluate your claim of memory problems and are now about to take a memory test for that purpose. Your task is to perform on that test as if your memory was impaired because of severe, persistent, chronic pain, however, you must fake your memory impairment in a way that is believable because if you are caught, your lawsuit will be thrown out of court and you will get nothing" (Etherton et al., 2005, p. 378-379).

3. The cold pressor pain group who take Digit-Span and Block-Design subtest in an honest normal manner to the best of their abilities while being subject to having their forearm submerged in cold water to induce mild to moderate pain and discomfort.

Before and after the testing, participants were asked if there was any reason they were not able to take the test to the best of their ability

Appendix C: Cold Pressor (Group 3) Instructions

This group will take the Digit-Span and the Block-Design subtests of the WAIS-IV intelligence scales (Wechsler, 2008) in a normal, honest fashion to the best of their abilities while being subjected to having their forearm submerged in cold water to induce mild to moderate pain and discomfort. The participants can withdraw from the study at any time for any reason. There is no remuneration for participation in the study. The results of the study will be made available to the participants upon their request when available. Participants in the cold pressor group complete the subtests in the context of cold-induced pain via the cold-pressor task.).

Immediately prior to administration of the subtests, participants are directed to place their hand or forearm into a container of cold water and asked to keep it in place during administration of the subtests. They are informed that they can remove their hand from the water if the CP induced pain becomes too great. Participants are asked to return their hand to the water as soon as they are able to do so. A 10-point numerical pain rating scale is used to record pain intensity. Such scales are commonly used in both clinical and research applications (Gracely, 1989; Peckerman et al., 1991). The scale and associated verbal descriptors (Mild Pain (1–3), Moderate Pain (4–6), Severe Pain (7–9), Very Severe Pain (10)) are presented prior to initiating the cold-pressor and remain visible throughout the procedure. Pain ratings are recorded at approximately one-minute intervals throughout administration of the subtests. Water temperature readings are recorded at approximately 5-min intervals. Data on the frequency and duration of hand

removal from the water are not recorded. Participants are free to withdraw from the study for any reason at any time if desired. The confidentiality of participants is to be maintained through the use of assigning the participants a number rather than using their names. Participants participate in the three groups of the study which includes:

1. The normal control group who take Digit-Span and Block-Design subtest in an honest manner to the best of their abilities.

2. The malingering faking group who take the Digit-Span and Block-Design subtest while being asked to fake cognitive difficulties allegedly caused by pain, the following explanation: Faking group explanation," Imagine that you have been in an accident and suffered an injury to your neck and shoulder. Initially you experience pain in that arm and hand, but now you're completely healed and experiencing no problems. Nevertheless, you have filed a lawsuit and you stand to gain a very large settlement if you are disabled. In your lawsuit, you are claiming that your pain has affected your ability to think, especially your memory. Because of the memory problems you have developed, you cannot do college-level work, and now your future employment opportunities are limited. You have been sent to a psychologist to evaluate your claim of memory problems and are now about to take a memory test for that purpose. Your task is to perform on that test as if your memory was impaired because of severe, persistent, chronic pain. However, you must fake your memory impairment in a way that is believable because if you are caught, your lawsuit will be thrown out of court and you will get nothing" (Etherton et al., 2005, p. 378-379).

3. The cold pressor pain group who take Digit-Span and Block-Design subtest in an honest normal manner to the best of their abilities while being subject to having their forearm submerged in cold water to induce mild to moderate pain and discomfort.

Before and after the testing, participants were asked if there was any reason they were not able to take the test to the best of their ability. The participants were not asked any health related question only if they believe there was anything that would impede their ability to participate and do their best.

Appendix D: Entrance Interview and Exit Interview

Using the WAIS IV to detect malingerers

Thomas Bybee, PhD clinical psychology student (researcher)

Dr. David Yells (Dissertation chairperson)

Walden University

Welcome and thank you for your participation in this dissertation study. This study is entitled “Using the WAIS IV to detect malingerers."

Malingering is a serious problem where people try to fake cognitive difficulties to get secondary monetary gain, or to be let out of work, or out of military service. Your participation in this study may help in the detection of those who are malingering and costing all of those of us who pay for insurance and have higher premiums due to those who are faking (malingering) to get monetary gain from insurers who are forced to increase their insurance rates due to the fraud caused by malingerers.

The study consists of three groups used for comparison for differences which might possibly indicate that a person is malingering. One group is asked to take the tests honestly in a normal fashion. The second group is asked to fake cognitive difficulties taking the same tests (malinger), and the third group is asked to take the tests honestly while experiencing mild to moderate laboratory induced pain while submersing their hand or forearm in cold water to simulate pain symptoms. Each participant is asked to

participate in all three groups. These three groups will be compared and the scores of the individuals in each of the groups for statistical differences which may indicate purposely faking.

This is a voluntary study and there is no compensation involved. Your participation in this study is greatly appreciated by the principal researcher, Thomas Bybee, who is a PhD clinical psychology student at Walden University doing his dissertation study.

Subtests from the WAIS-IV scales were used in this study including the digit span and the block design subtests from the WAIS-IV fourth edition. Each of these subtests should take no longer than about 5 min to administer. Possibly a little longer for those who will be submersing their hand or forearm in cold water (cold pressor group) because they will also be asked how much discomfort they are feeling on a scale of 1 to 10 with one being little to none and 10 being extreme, so that the researcher can ascertain the safety of the individuals participating in that portion of the testing so they can be asked to stop participating if it is a risk to them due to too much pain. Individuals are free to withdraw from any of the testing situations at any time for any reason with no penalty.

The study intends to keep the participant identity confidential by assigning a number rather than using the participant's name. At the end of this study if you desire a copy of the results of the study will be sent to you. The only reason personal information would be kept is so that the results of the study may be sent to you if requested.

There are a few questions that we need to ask before we begin:

Do you believe that there will be any reasons why you would not be able to participate to the best of your abilities in this testing?

Are you taking any medications which may hinder your ability participate and to do your best?

What is your age?

Are you right or left handed?

Because of the cold pressor group (group submerging their hand or forearm into cold water) the researcher also needs to know which is your best hand, (right or left handed) because one of the subtests, (the block design subtest) requires you to use your hand to manually manipulate blocks to replicate designs which you are shown. And if you're up to perform this task in the best of your abilities it makes sense to use your best hand. Do you have any questions?

"Exit interview:

Were you able to participate to the best of your abilities?

Do you have any questions?"