

AN ABSTRACT OF THE THESIS OF

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Title: An Examination of the Relationship Between the  
Patterns of Subtle-Obvious Item Endorsement  
and Intelligence.

Abstract Approved: David A. Quigley

Wiener (1948) developed the Subtle-Obvious (S, O) subscales for five clinical scales in the Minnesota Multiphasic Personality Inventory (MMPI) (i.e., Depression, Hysteria, Psychopathic Deviate, Paranoia, and Mania) in order to detect test taking attitudes. The influence of intelligence on the S and O subscales was one of several results Wiener presented. His results showed that males with an IQ one standard deviation above the mean have approximately equal S and O scores.

The present study investigated the S-O scores of 55 males with an IQ above 110 who were convicted of driving under the influence and subsequently received a court-ordered substance abuse evaluation between 1990 and 1992 at a midwestern mental health center. As part of the substance abuse evaluation, the participants were administered the MMPI and the Shipley Institute of Living Scale IQ test. T-scores from the S scales and O scales, IQ, and pertinent demographic information were gathered from already established files.

A dependent t-test was performed between the subtle T-

score means and the obvious T-score means for each subscale. Supporting Wiener's result, the means for the Mania subscale were not significantly different, however, in contradiction to Wiener's results, the means for the remaining S-O subscales were significantly different. In fact, the O means were higher than the S means which was the pattern Wiener found in low intelligence individuals. Possible explanations and practical implications for the results are discussed.

AN EXAMINATION OF THE RELATIONSHIP BETWEEN THE PATTERNS OF  
SUBTLE-OBVIOUS ITEM ENDORSEMENT AND INTELLIGENCE

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A Thesis  
Presented to  
the Division of Psychology and Special Education  
EMPORIA STATE UNIVERSITY

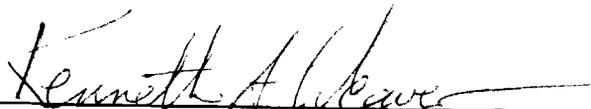
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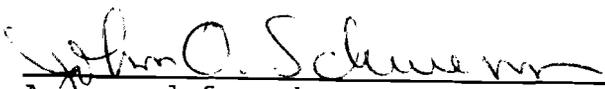
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by  
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July 1994

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## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS .....	iii
TABLE OF CONTENTS .....	iv
LIST OF TABLES .....	v
CHAPTER	
1. INTRODUCTION .....	1
Literature Review .....	1
2. METHOD .....	9
Subjects .....	9
Instruments .....	9
Procedure .....	9
3. RESULTS .....	11
4. DISCUSSION .....	14
REFERENCES .....	19

LIST OF TABLES

Table	Page
1. Summary Information for the Subtle-Obvious Subscales .....	13

## CHAPTER 1

## INTRODUCTION

Psychologists have been interested in the relationship between intelligence and personality characteristics for decades. Specifically, clinicians have wanted to use measures of intelligence as diagnostic tools for deviant behavior. The relevant research, however, does not support this use of intelligence tests. One of the more popular personality measures, the Minnesota Multiphasic Personality Inventory (MMPI) (Hathaway & McKinley, 1943), has been utilized in numerous research studies to investigate the relationship between personality and intelligence.

Review of the Literature

Brower (1947) administered the Wechsler-Bellevue Adult Intelligence Scale and the entire MMPI to undergraduate students attending New York University. He reported that only the Hypochondriasis ( $r = -.60$ ), Hysteria ( $r = -.65$ ), and Psychopathic Deviate ( $r = -.57$ ) scales correlated with total IQ. According to Brower, very intelligent, in contrast to moderately intelligent individuals, are less likely to display maladjusted symptoms. Using a different population from Brower, Winfield (1953) found only a small correlation ( $r = .28$ ) between the Masculinity-Femininity scale and IQ using caucasian males with neuropsychiatric disabilities at a Veterans Administration Hospital. He explained the difference between Brower's (1947) results and

his as stemming from the different samples.

Using the Otis Self-Administering Tests of Mental Ability, in place of the Wechsler-Bellevue, and the Hypochondriasis (Hs), Depression (D), Hysteria (Hy), Psychopathic Deviate (Pd), Masculinity-Femininity (Mf), Paranoia (Pa), Psychasthenia (Pt), Schizophrenia (Sc), and Hypomania (Ma) clinical scales from the MMPI, Wexner (1954) reported only a significant correlation ( $r = .33$ ) between the Otis and the Pa scale using undergraduate psychology students. Paranoia scores slightly increased with greater intelligence.

Administering four intellectual ability tests and the MMPI to 1630 subjects who were applying for the Israeli Police, Caspy, Reisler, and Mendelson's (1987) correlations ranged between  $-.43$  to  $.27$  for the MMPI clinical scales. Males tended to have higher correlations on the D and Ma scales whereas females displayed higher correlations on the Mf scale. Caspy, Reisler, and Mendelson speculated that the gender differences appeared because of the large number of male subjects ( $n = 1429$ ) as compared to female subjects ( $n = 201$ ) in the study.

Although a criminals' intelligence and aggressiveness are inversely related (Holland, Beckett, & Levi, 1981; Monahan, 1981), the relationship between personality characteristics, as measured by the MMPI, and intelligence has received little support. Comparing the MMPI and the

Wechsler Adult Intelligence Scale (WAIS) Digit Span subtest of prison inmates in a state penitentiary and psychiatric patients in a state hospital, Ruff, Templer, Ayers, and Barthlow (1977) found a significant correlation ( $r = -.57$ ) for the Ma scale for the former and a significant correlation ( $r = -.42$ ) for the Lie scale for the latter. Hall (1989) reported no significant correlations between the MMPI and the Wechsler Adult Intelligence Scale-Revised (WAIS-R) for male sexual offenders in a state hospital.

Psychiatric populations, which tend to have neurotic, psychotic, characterological, or organic disorders, primarily provide the samples employed by these studies. Using hospitalized psychiatric patients, Gaines and Morris (1978) found high elevations on the clinical and validity scales of the MMPI, except for Ma, were related to lower IQs. When Gaines and Morris examined the relationship between the 11 subtests on the WAIS and the MMPI scales, few relationships were found. Low scores on the Vocabulary subtest of the WAIS corresponded to high elevations on the Pd, Pa, Pt, Sc, and Ma scales. Correll (1985) discovered that the WAIS Block Design subtest significantly related to the D scale.

Employing psychiatric patients, Terry and Berg (1984) examined the relationship between the Pd scale, the Picture Arrangement subtest of the WAIS, and the Social Introversion (Si) scale. They found high relative to low Pd extroverts

tended to be more intelligent. Also, subjects who were highly introverted displayed lower intelligence than did low Pd introverts. Marlowe and Bedell (1982) failed to obtain a significant correlation between the Si scale and the Shipley-Hartford Abstract and Verbal measure of intellectual ability in a psychiatric population.

Watson, Davis, and McDermott (1976) used subjects who had either organic brain deficits or schizophrenia. They did not present the actual correlations, but reported that the majority of significant correlations for the schizophrenia groups were negative. A large number of significant correlations among the organic groups were obtained, but no direction for the groups prevailed. Using brain-damaged, schizophrenic, neurotic, and alcoholic patients, Holland and Watson's (1980) correlations on the WAIS subtests and the MMPI scales ranged between  $-.26$ .

In 1985, Gass and Russell used 31 male left hemisphere damaged patients to test verbal-intellectual impairment on emotional adjustment. The WAIS Verbal IQ score failed to correlate with the F, Si, Sc, and Pt scales, when educational influences were partitioned out. If a relationship between Verbal IQ and a MMPI profile exists, they concluded that its strength is marginal.

Gass and Russell (1987) used 50 male patients with right hemisphere damage to evaluate how performance-intelligence affects emotional adjustment. However,

correlations failed to reach statistical significance. "Clinicians should be somewhat reluctant to conceptualize symptoms such as depression, anxiety, and vague physical complaints as an emotional reaction to performance-intellectual deficits incurred as a result of brain damage because this 'reaction' appears to occur independently of the WAIS Performance scale IQ" (p. 488).

Intelligence and education have been found to influence the Mf scale of the MMPI (Graham, 1990). However, Sines (1977) found no correlation between the Mf scale and the WAIS using a sample of college students. Cernovsky (1985) reported a significant correlation between the Mf scale and the WAIS Vocabulary subtest ( $r = .41$ ) and a nonverbal reasoning instrument ( $r = .30$ ) on male substance abusers. Cernovsky concluded that higher scores on the Mf scale were associated with higher intelligence for male substance abusers. Cernovsky (1986) used female substance abusers and found lower Mf scores associated with higher IQ scores. This gender difference was appropriate because females tend to score lower on the Mf scale and males usually have elevated Mf scores.

When the MMPI was developed, validity scales (e.g., L, F, and K) were created to determine an individual's test taking attitude for the entire instrument. Wiener (1948), who developed the subtle and obvious (S, O) keys for the MMPI, believed that being able to detect test taking

attitude on individual clinical scales would be more useful and yield more information than the overall validity scales. Thus, Wiener and his associates developed the S and O keys for the D, Hy, Pd, Pa, and Ma clinical scales of the MMPI. Wiener also intended the scales to differentiate between normal and abnormal populations. He felt that seriously disturbed individuals would be more open about their symptoms and thus choose obvious responses. Subtle responses would be needed to distinguish between maladjusted and a normal population.

The influence of intelligence on the S and O keys was just one of several results Wiener (1948) presented. Wiener's results showed that highly intelligent individuals would have approximately equal S and O scores while lower intelligence individuals would have higher O scores than both S and O scores for the high intelligent individuals. Wiener presented mean scores but failed to explain the specific statistical techniques he used to arrive at these conclusions. Using the Unit Scales of Aptitudes or the Otis Self-Administering Tests of Mental Ability and the number of years of education to measure intelligence, 40 subjects comprised the high intelligence group, defined as an IQ above 115 ( $SD = 1.00$ ), and the low intelligence group, described as one standard deviation below the mean, consisted of 29 subjects. He suggested that continued investigation into the S and O keys be carried out.

A few studies investigating the relationship between intelligence and the S and O keys have been completed since Wiener's research. Using undergraduate college American College Test (ACT) scores, Burkhart, Gynther, and Christian (1978) found no significant correlation between ACT and item endorsement under a fake-good or standard instructional group. However, in the fake-bad instructional group, higher intelligence individuals endorsed more obvious items than less intelligent individuals.

In 1983, Dubinsky administered the MMPI to 171 undergraduate students in order to investigate the relationship between S and O items and ability on the verbal section of the Scholastic Aptitude Test (SAT). The results demonstrated that higher ability subjects endorsed more S items than lower ability subjects with this being more significant for females than males. Higher ability female subjects endorsed significantly fewer O items than lower ability female subjects. No significant relationship existed between male ability and O item endorsement.

Administering the Shipley Institute of Living Scale to 161 psychiatric patients, Fowler (1984) found that S item endorsement increased with increasing intelligence. Hawbaker (1991) used individuals who were convicted of driving under the influence of alcohol to investigate the relationship between the Shipley Institute of Living Scale and the S and O item endorsement on the Pd subscale. She

established three groups based on S and O endorsement pattern (e.g., equal S-O, high S, and high O) and then compared the groups IQ scores. A one-way analysis of variance failed to reveal a significant difference between the groups IQ scores.

Research on Wiener's (1948) S and O keys has supported only his original result that low intelligence subjects would have higher O item endorsement; the equal S and O item endorsement result among high intelligence subjects has not been supported. Continued research needs to be done on high intelligence groups because a direct replication of Wiener's work has not been completed. Therefore, taking high intelligence subjects and comparing each subscale's S and O scores would test Wiener's results. It is hypothesized that the S and O range would be similar, consequently, accepting the null hypothesis. The results of the present study will help clarify the relationship between high intelligence and S-O item endorsement patterns.

## CHAPTER 2

### METHOD

#### Subjects

The subjects consisted of 55 males 18 years of age and older, similar to Wiener's (1948) research. However, Wiener employed a normal population in his study, while this study used individuals who were convicted of driving under the influence (DUI) and subsequently received a court-ordered substance abuse evaluation between 1990 and 1992 at a mental health center in a small midwestern town. Permission to gather pertinent demographic information and scores from already established subject's files was granted by the mental health center.

#### Instruments

The Shipley Institute of Living Scale (Shipley, 1939) was utilized to assess intelligence. The Depression (D), Hysteria (Hy), Psychopathic Deviate (Pd), Paranoia (Pa), and Mania (Ma) Subtle-Obvious (S, O) subscales of the Minnesota Multiphasic Personality Inventory (MMPI) were employed. Each subscale produced a subtle T-score and an obvious T-score. The scores from the subscales were acquired from The Marks Adult MMPI Report, a computer generated interpretation of the MMPI.

#### Procedure

Individuals were administered the MMPI and the Shipley in a group testing environment at a mental health center

after being referred for a substance abuse evaluation following a DUI conviction. These tests were standard for a substance abuse evaluation at this mental health center. The needed information was gathered from 55 previously established files between 1990 and 1992. More recent data was not available because the mental health center discontinued giving the entire MMPI and the Shipley during 1992.

In order to get an adequate sample of high intelligence individuals, the subject needed to have a Shipley IQ score above 110 to qualify for this study. The IQ score was collected for those who met this criteria. A S T-score and an O T-score for each of the five S-O subscales were gathered. Age and education level were recorded to compare the level of education with Wiener's subjects.

## CHAPTER 3

## RESULTS

The purpose of this study was to compare the T-scores from the Subtle-Obvious subscales (Depression, Hysteria, Psychopathic Deviate, Paranoia, and Mania) using above average intelligent individuals as subjects. The 55 male participants, who had a mean age of 28.73 (SD = 10.08), were convicted of driving under the influence and subsequently received a court-ordered substance abuse evaluation. The sample contained a mean IQ of 113.29 (SD = 3.17) with a mean educational level of 13.80 years (SD = 1.98).

Mean T-scores for each S-O subscale were calculated. The mean for the Depression S scale was 46.98 (SD = 7.85) with the Depression O scale having a mean of 59.44 (SD = 9.04). The Hysteria S scale obtained a mean of 45.04 (SD = 9.31) and the mean for the Hysteria O scale was 63.11 (SD = 8.87). The obtained mean on the Psychopathic Deviate S scale was 48.42 (SD = 7.95). The Psychopathic Deviate O scale received a mean of 61.20 (SD = 10.45). The mean for the Paranoid S scale was 48.51 (SD = 7.47) and the Paranoid O scale obtained a mean of 62.51 (SD = 8.53). The Mania S-O means were extremely similar. The mean for the Mania S scale was 50.85 (SD = 8.23) and the Mania O scale had a mean of 50.36 (SD = 10.47). The S and O T-score means are displayed in Table 1.

A dependent t-test performed between the S and O means

for each subscale revealed mixed results. The  $t$ -test for the Depression subscale indicated a significant effect,  $t(54) = 7.40, p < .001$ . A significant effect was obtained for the Hysteria subscale,  $t(54) = 8.85, p < .001$ . The Psychopathic Deviate subscale also had a significant  $t$ -test,  $t(54) = 6.70, p < .001$ . The Paranoid subscale received a significant effect,  $t(54) = 8.56, p < .001$ . The  $t$ -test that was performed on the Mania subscale failed to reach significance,  $t(54) = .33, p < .743$ . The results of the  $t$ -tests are revealed in Table 1.

Table 1

Summary Information for the Subtle-Obvious Subscales

Subtle-Obvious Subscale	Mean T-Score	Standard Deviation	<u>t</u>	<u>p</u>
<u>Depression</u>				
Subtle	46.98	7.85	7.40	.001
Obvious	59.44	9.04		
<u>Hysteria</u>				
Subtle	45.04	9.31	8.85	.001
Obvious	63.11	8.87		
<u>Psychopathic Deviate</u>				
Subtle	48.42	7.95	6.70	.001
Obvious	61.20	10.45		
<u>Paranoia</u>				
Subtle	48.51	7.47	8.56	.001
Obvious	62.51	8.53		
<u>Mania</u>				
Subtle	50.85	8.32	.33	.743
Obvious	50.36	10.47		

## CHAPTER 4

## DISCUSSION

Using offenders convicted driving under the influence (DUI), the results of the current study supported and contradicted Wiener's (1948) results. His results indicated that high intelligence individuals obtained similar scores on the Subtle-Obvious subscales. Supporting Wiener, the dependent  $t$ -test revealed that the Mania subscale means for the current study were not significantly different. The means from the remaining S-O subscales were significantly different, which contradicted Wiener's results. In fact, the O means for the participants were higher than the S means on the D, Hy, Pd, and Pa subscales. Wiener's research demonstrated that low, in contrast to high, intelligent individuals would have elevated O scores. The present findings also contradicted Dubinsky (1983) and Fowler (1984), who found that as IQ increased, so did subtle item endorsement.

One statistical explanation for the results is related to the power of the study. Power is the probability that the null hypothesis will be rejected when it is false (Cohen, 1969). Therefore, included in the make up of power is Type II error, which is accepting the null hypothesis when it is false. Since the present study wanted to accept the null hypothesis, the power of the study needed to be addressed. In order to determine power, effect sizes, the

degree to which the groups differ, were calculated. The effect sizes for the present study were between .01 to .31 which according to Cohen is small. Small effect sizes are interpreted as the difference between two groups being minimal. Thus, having a small effect reduced the power of the study. An additional influence that may have lowered the power of the present study was alpha level. A high alpha level decreases the power of a study and decreases the probability of falsely rejecting the null hypothesis. Finally, another influence on power is sample size. Generally, when sample size is large, power is not an issue. In the current study, there were 55 subjects.

The calculated power values for the present study were between .01 to .46 which means there was the possibility of committing a Type II error on the Mania subscale. However, this was unlikely because the means were very similar. Increasing the power of the present study required increasing sample size or effect size or decreasing alpha level.

Another reason the present study contradicted previous research may be due to the nature of the sample. In each of the previous research, the population samples differed. Clearly, college students, psychiatric inpatients, normal males from Minnesota, and DUI offenders possess characteristics that are different from each other. The fact the participants in the current study were court

ordered to receive a substance abuse evaluation, may have influenced these individuals to answer the MMPI only in order to complete the necessary requirements of a DUI arrest in a timely manner.

The offenders could have endorsed obvious items because they thought their therapist expected them to admit to these problems and a failure to do so would lead to lengthy therapy. Significantly higher scores on the obvious subscales versus the subtle subscales tend to indicate a faking-bad posture or an exaggeration of psychological problems. This would suggest the participants may have been faking bad on the Depression, Hysteria, Psychopathic Deviate, and Paranoia subscales, since the obvious scores obtained for these subscales were significantly higher than the subtle scores on the same subscales.

When Burkhart, Gynther, and Christian (1978) had individuals fake-bad on the MMPI, higher intelligence individuals endorsed more obvious items than less intelligence individuals. The current study did not have the participants intentionally fake bad, but it did obtain similar results as Burkhart et al. A possible explanation for this is the nature of the circumstances. It is probable that the offenders felt they were suppose to endorse obvious items because they were receiving an evaluation at a mental health center. Further investigation between the discrepancies in the current study and Burkhart, Gynther,

and Christian (1978) is needed.

Individuals who abuse substances tend to have manic qualities (e.g., impulsiveness, excessive energy, and sociability). These individuals usually have elevated scores on the MMPI Mania clinical scale. It may be possible that above average intelligence individuals, who were convicted of a DUI offense, were able to distinguish between the subtle and obvious pathological items on the Mania scale, thus, achieving an equal S score and O score.

All participants included in the present study had an IQ above 110. The sample pool did not contain enough male subjects with an IQ above 115, which would have matched Wiener's criteria. The mean IQ for the current study was only 113.29. This may account for the discrepancies in the results.

The instrument used to measure intelligence may have led to other results. The Shipley Institute of Living Scale IQ used in this study primarily assesses an individual's verbal abilities, therefore, the subjects were not assessed in terms of motor performance, mathematical, and abstract reasoning abilities, which also comprise intelligence. It is possible that intelligence was not completely measured due to the limitations of the Shipley. While the IQ of Wiener's (1948) subjects was measured with the Unit Scales of Aptitudes or the Otis Self-Administering Tests of Mental Ability, the shortcomings may not have influenced the

results because the S and O scores were similar on the Mania subscale.

For those clinicians who use the MMPI's Subtle-Obvious scales, it would not be prudent for them to predict the S-O item endorsement pattern based on a client's intelligence. The clinician should also be cautious in predicting a clients' intelligence levels based on their S-O pattern. The present study has not supported the use of the S-O scales and intelligence in these manners. The clinician also should be aware that depressed or manic individuals tend to self-medicate themselves with alcohol, which usually leads to substance dependence.

Further research on the relationship between intelligence and subtle-obvious item endorsement would be valuable. For instance, examining a population similar to Wiener's normal male sample with an IQ one standard deviation above the mean would be advantageous. Also, using the Wechsler Adult Intelligence Scale-Revised would be beneficial, because it produces a more complete assessment of intelligence. Further investigation into the gender differences Dubinsky (1983) discovered needs to be completed. In addition to these suggestions, it would be valuable to use the MMPI-2 when investigating Wiener's results. The MMPI-2 employed a nationally representative sample when its norms were developed and developed new T-score transformations. The MMPI, which was used in the

current study, was based on an sample from Minnesota that was not representative of the national population at the time.

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