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# INCREMENTAL VALIDITY OF MMPI AND MMPI-2 CLINICAL SCALES IN DETECTING MALINGERING

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*The efficacy of the F scale and F-K index in detecting faking of a mental illness was investigated for both the MMPI and MMPI-2. A total of 72 undergraduate students completed the MMPI and 74 completed the MMPI-2 after receiving instructions to feign severe mental illness. Student responses were analyzed against MMPI (n = 180) and MMPI-2 (n=76) data obtained from psychiatric inpatients diagnosed with severe mental illnesses. Multiple regression analysis of the validity scales and F-K index indicate that the F scale is the best predictor of malingering both for the MMPI (r = .64) and MMPI-2 (r = .74) and the two samples combined (r = .71). The Si and D scales accounted for statistically significant, yet small, amounts of incremental validity. The presence of a "sawtooth" pattern did not add any incremental validity. Though an F scale cut-off score of T > 109 resulted in an 85.9% classification accuracy rate, it appears that categorizing scores into one of five ranges results in better classification accuracy than a single cut-off score.*

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There are many situations where it is advantageous for an individual to feign a psychological illness (to malingering). For example, a defendant in a criminal case might want to plead not guilty by reason of insanity (NGRI), an individual might want to appear to have psychological problems to be eligible for disability payments, and a convict might want to appear "insane" to be assigned a cell without a roommate.

Because of the many situations in which individuals are motivated to malingering, psychologists have devised several methods for detecting malingering. The most common are the clinical interview and psychometric assessment. Clinical interviews can be conducted so that an individual's answers can be compared to psychiatric norms, or nonverbal cues can be used to assess the honesty of a person's verbal answers (Resnick, 1984).

Arguably, the most effective method of detecting malingering is psychometric assessment. The most commonly used of these assessments are the original and revised versions of the Minnesota Multiphasic Personality Inventory (MMPI; MMPI-2). The MMPI is administered to an individual, and the test's validity scales are used to determine the probability that the person is malingering. These scales usually include the standard validity scales of L, F, and K as well as such specially developed scales as Gough's F-K index, Ds, Mp, subtle v obvious, Cof, and En. The Back Page Infrequency Scale (Fb), Variable Response Inconsistency Scale (VRIN), and True Response Inconsistency Scale (TRIN) are also used with the MMPI-2. An abundance of research investigating the ability of the MMPI and MMPI-2 to detect malingering can be summarized as follows:

1) Though there is some variability across studies, meta-analyses by Aamodt (1990) and Berry, Baer, and Harris (1991) indicate that the best predictor of malingering is the F scale.

2) As shown in Table 1, the method used to conduct the study greatly affects the ability of the MMPI validity scales to detect malingering. That is, the F scores of people asked to fake the MMPI are almost four standard deviations higher than normals whereas F scores of people known to be malingering are only 1.5 standard deviations higher than people known not to be malingering (Aamodt, 1990).

3) Though the optimal cutoff score for the F scale is often reported to be in the neighborhood of 28, the reason for the suspected malingering (e.g. NGRI v. personal injury claim) must be taken into consideration (Lees-Haley, 1989; 1992)

4) Research indicates that intelligent people with knowledge of the MMPI-2 are able to elevate scores on the clinical scales while keeping F scale scores at moderate levels (Pelfrey & Aamodt, 1996).

5) Research using the MMPI-2 indicates coaching malingerers about strategies to escape detection results in validity scores similar to those of actual schizophrenics (Rogers, Bagby, & Chakraborty, 1993).

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**Table 1: Effect Sizes (Cohen's D) of Various Research Designs**

Research Design	F	F-K
Known Groups	1.48	.54
Motivated Groups	.70	.72
Fake Bad v. Normal Population	4.40	4.40
Fake Bad v. Forensic Population	3.87	2.04

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Note: Effect sizes are from the Aamodt (1990) meta-analysis

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Though the use of the MMPI in detecting malingering has been heavily researched, there are still some areas needing further investigation. One such area involves the ability of the clinical scales to add incremental validity to the F scale. Though previous research has clearly established that the F scale by itself is superior to any other validity scale or clinical scale in detecting malingering, it is possible that malingerers might have elevations on some scales but not others. That is, a malingerer might think it is important to have hallucinations and ideas of persecution but not hyperactive or compulsive behaviors. Thus it is possible that certain clinical scales could add incremental validity to, rather than substitute for, F scale scores.

The purpose of this present study is to:

- 1) Confirm that the F scale is a better predictor of malingering for both the MMPI and MMPI-2 than the F-K index;
- 2) Compare optimal F scale cut-off scores for both the MMPI and MMPI-2; and,
- 3) Determine the extent to which the clinical scales can add incremental validity to the F scale in determining malingering.

## **METHOD**

### **Subjects**

The MMPI was administered to 76 undergraduate students and the MMPI-2 to 74 students enrolled in introductory psychology courses at a medium-sized university. The mean age for the student sample was 23.5; 75% were female. Three state psychiatric hospitals provided data from 180 MMPI and 72 MMPI-2 profiles for psychiatric patients diagnosed with severe mental illnesses. The mean age for the forensic sample was 39.1; 38% were female. The student sample averaged 14.1 years of education compared to 11.6 years for the forensic sample.

### **Procedure**

In the student sample, participants were offered extra credit toward their course grade in exchange for their participation. Prior to completing the questionnaire, students were asked to play the role of a murderer trying to plead NGRI. They were read the following instructions:

*You have committed a murder and are in danger of receiving the death penalty if found guilty. Your only hope is to plead not-guilty-by-reason-of-insanity. For this strategy to work, you will need to fake a psychological test so that you appear "crazy." However, you need to be careful because the test contains scales to catch people who are faking.*

As an added incentive, students were offered triple the normal amount of extra credit if they were able to come across as being insane but did not get detected by the validity scales. In actuality, all subjects received the "triple credit" regardless of their performance.

The MMPI and MMPI-2 scores of the student sample were compared with the MMPI and MMPI-2 scores from a forensic sample. The data for the forensic sample were provided by three separate state psychiatric hospitals and included data for patients diagnosed with serious mental illnesses (substance abuse patients were not included).

## **RESULTS AND DISCUSSION**

### **Efficacy of the F Scale in Detecting Malingering**

Table 2 displays MMPI and MMPI-2 means for each condition. Table 3 displays the results of the correlations between the clinical and validity scales and the participants' classification as a malingerer (coded as a 2) or a psychiatric patient (coded as a 1). Because we had no control over the MMPI and MMPI-2 data given to us by the hospitals, as can be seen in Table 1, the clinical profiles for the psychiatric patients in the MMPI and MMPI-2 samples are different; a difference that was not expected nor desired. However, as shown in Table 3, despite these different profiles, the F scale was the best predictor for the MMPI, MMPI-2, and combined data sets with the F-K close behind. This finding is consistent with previous meta-analyses showing that the F scale is the single best predictor of malingering.

### **Incremental Validity of the Clinical Scales**

To determine if consideration of the clinical scales would significantly increase detection of malingering, the validity scales and clinical scales were subjected to a stepwise logistic regression using the STEPDISC procedure in the Statistical Analysis System (SAS). This analysis is essentially a stepwise multiple regression used when the dependent variable is dichotomous (patient, malingerer) rather than continuous (Wright, 1995). As shown in Table 4, for the MMPI and MMPI/MMPI-2 combined data sets, both the D and Si scales accounted for small, but statistically significant, amounts of variance above that accounted for by the F scale. No clinical scales added incremental validity for the MMPI-2. Taken together, these results suggest that there would be little, if any, practical significance in utilizing the clinical scales in addition to the F scale to detect malingering. Using a regression formula including the F, D, and Si scales resulted in a classification accuracy of 87.2% which is not significantly different from the 85.9%

accuracy rate that resulted from the use of the F scale alone.

**Table 2: Mean MMPI and MMPI-2 T Scores for Malingers and Psychiatric Patients**

Scale	MMPI Version					
	MMPI		MMPI-2		Combined	
	Malingers	Patients	Malingers	Patients	Malingers	Patients
L	48.31**	53.39	54.32	55.84	51.27	53.91
F	137.33**	74.48	154.73**	76.37	145.91**	74.88
K	46.29**	52.14	38.43**	47.01	42.41**	51.05
F-K*	23.05**	-1.52	25.67**	-0.01	23.95**	- 0.98
Hs	84.28**	73.46	72.15**	53.39	78.29**	69.22
D	64.49	66.27	69.17**	60.95	66.80**	65.15
Hy	64.17	62.57	63.09**	54.84	63.64**	60.94
Pd	87.57**	80.14	76.60**	54.33	82.16**	74.70
Mf	46.91**	58.01	39.16**	46.40	43.09**	55.56
Pa	90.30**	69.92	95.59**	67.45	92.91**	69.40
Pt	81.91**	77.77	74.89**	51.91	78.44**	72.31
Sc	108.09**	85.34	106.70**	62.87	107.40**	80.60
Ma	63.48	60.61	73.56**	52.40	68.45**	58.88
Si	67.69**	56.75	66.33**	56.65	67.02**	56.73

\* Means for F-K are raw scores rather than T Scores

\*\*Mean differences between malingers and patients is significant at the .001 level or higher

**Table 3: Correlation's Between MMPI and MMPI-2 Scores and Malingering**

Scale	MMPI	MMPI-2 Combined	
	(n=304)	(n=135)	(n=439)
L	-.19*	-.05	-.10
F	.64**	.74**	.71**
K	-.22**	-.36**	-.34**
F-K	.62**	.70**	.67**
Hs	.31**	.45**	.24**
D	-.05	.28*	.05
Hy	.05	.28*	.09
Pd	.19*	.56*	.18**
Mf	-.29**	-.26*	-.35**
Pa	.48**	.59**	.55**
Pt	.17*	.52**	.18**
Sc	.52**	.69**	.54**
Ma	.09	.52**	.28**
Si	.35**	.43**	.38**

Note: Malingers were coded as 2 and psychiatric patients as 1, thus positive correlations indicate higher MMPI and MMPI-2 scores are more associated with malingers than patients

**Table 4: Incremental Validity of the MMPI and MMPI-2 Clinical Scales in Detecting Malingering**

MMPI Version	Scale	r <sup>2</sup>	R <sup>2</sup>	p <
MMPI	F	.414	.414	.0001
	D	.041	.455	.0004
	Si	.038	.493	.0007
MMPI-2	F	.551	.551	.0001
MMPI & MMPI-2	F	.501	.501	.0001
	D	.029	.530	.0003
	Si	.029	.559	.0003

Though entering individual clinical scales into a regression did not greatly increase accuracy in detecting malingering, it is possible that a pattern of scores would be useful. Such a pattern suggested in the literature is the "sawtooth pattern" in which there is an elevation on certain even-numbered clinical scales (2-D, 4-Pd, 6-Pa, and 8-Sc) but not certain odd-numbered scales (1-Hs, 3-Hy, 5-Mf, 7-Pt, and 9-Ma).

To test this possibility, two clinical psychology graduate students (Teresa VanNostrand and Misti Jones) were given the clinical scale scores in our data set, asked to plot the scores, and indicate the presence (coded 1) or absence (coded 0) of a sawtooth pattern. This rating was then entered into a stepwise logistic regression with the F scale. The results of this analysis indicated that although the sawtooth pattern correlated significantly with malingering ( $r = .22$ ), it was not as strong of a predictor as the F nor did it add statistically significant incremental validity to the F scale.

#### **Setting Cut-Off Scores for the F Scale**

Previous research has attempted to find one cut-off score that maximally differentiates between malingerers and people with severe psychological disorders. For our data set, such a cut-off score of  $F > 109$  would result in 85.9% of our participants being accurately classified. However, as shown in Table 5, our data suggest that setting several ranges of scores rather than one cut-off score might be optimal. As can be seen in Table 5, there are two ranges of scores ( $T < 60$  and  $T > 140$ ) in which we are very confident about the extent to which a person is malingering, two others in which we are relatively confident ( $T$  scores between 61-87 and  $T$  scores between 88 and 109), and one range ( $T$  scores between 110 and 139) in which the F score provides no utility in detecting malingering.

These findings are important because they suggest that although the F scale is very useful in detecting malingering for the 47% of our sample scoring less than 110 or greater than 140, we need to find other means of detecting malingering for the 13% whose F scores fall within the 110-130 range and perhaps the 40% whose F scores fall within the 88-109 range. Such means might include other clinical tests or greater reliance on the clinical interview. Though it is clear from the abundance of research that the F scale is the single best predictor of malingering, further research is warranted to find alternative predictors for the F score ranges that appear to be invalid.

Table 5: Classification Accuracy Using the F Scale

MMPI Version	Sample		Accuracy
	Patients	Malingers	
<b>MMPI</b>			
0 - 60	88	1	98.9%
61 - 87	87	12	87.9%
88 - 109	28	7	80.0%
110 - 139	19	20	51.3%
140 +	6	36	85.7%
<b>MMPI-2</b>			
0 - 60	23	1	95.8%
61 - 87	16	5	76.2%
88 - 109	14	5	73.7%
110 - 139	8	12	60.0%
140 +	0	50	100.0%
<b>MMPI &amp; MMPI-2</b>			
0 - 60	110	2	98.2%
61 - 87	102	17	85.6%
88 - 109	42	11	79.2%
110 - 139	25	30	54.5%
140 +	6	87	93.5%

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