RESPONSE LATENCIES AND FAKING ON THE MMPI-2: IMPLICATIONS FOR ELEVATED VERSUS NONELEVATED PROFILES

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CHAPTER 1

INTRODUCTION

Researchers and clinicians in the field of psychology have been constructing, investigating, and utilizing self-report measures of personality and psychopathology since the 1920's. Benefits of individually administered personality inventories include accessing important therapeutic information quickly and inexpensively. Self-report inventories are also widely used for personnel selection and for the assessment of individuals' qualifications to receive disability benefits. Because of the importance of obtaining valid information from the assessment process, several validity indices have been developed and included in many of the questionnaires to control for the effects of individuals' efforts to distort their test results. Some of these indices are targeted at detecting exaggerated profiles, where the individual deliberately attempts to over-report psychopathology. Other indices are developed to detect under-reporting. Yet others detect random responding, or the tendency to respond in a socially appropriate manner.

The usefulness of an inventory often depends on its resistance or ability to detect faking. However, few tests have been successful in resisting attempts at faking, or flawlessly detecting faking, when it occurs. One reason for this apparent limitation may be that researchers in the area of personality assessment have concentrated on developing a theoretical faking-resistant inventories and have ignored the process of how individuals fake. Further, if the faking process itself is understood, and differences between the response styles of individuals with intent to deceive and those that respond honestly are detectable, universal faking indicators may be identified (Holden, Kroner, Fekken, and Popham, 1992). One response process variable that is currently under investigation by several researchers is the response latency difference between honest responders and responders who are instructed to fake (e.g., Holden et al., 1992).

A subject's response latency on an inventory item is the time that elapses between the presentation of a stimulus and the response to that item. A computer is utilized to keep track of the elapsed time. The computer administration of personality inventories has become increasingly viable and popular (Space, 1981). Even though computerized versus conventional administration has not been found to be universally equivalent (Honaker, 1987), computer administration is becoming quite common. In addition to being more appealing to test-takers because of the increased speed of completing a questionnaire, response latency recording is possible with the aid of the computer (Butcher, Keller, & Bacon, 1985; Space, 1981).

Investigators have only recently begun to explore the link between faking and response latencies on personality inventories. Evidence is accumulating showing that respondents behave differently when they fake their responses versus when they take the test honestly (as detected by their latencies). Existing response process theories (e.g., Rogers, 1977; Kuncel, 1973; Kuiper, 1981) are being applied by some investigators (Hsu, Santelli, & Hsu, 1989) and elaborated on by others (Holden, et al., 1992) to explain these differences. Further research is needed to fully understand how individuals' attempts to distort their responses affect their response latencies.

The present study will investigate the relationship between response latencies and personality inventory responding. Response process theories will be examined to better understand how individuals behave on self-report instruments. Further, how may their behaviors change due to motivational factors (e.g., motivation to fake bad or fake good)?

The Model

As discussed above, a new model of faking (Holden et al., 1992) has been proposed that predicts response latency differences based on the congruence between an item and an individual's schema. Evidence is accumulating supporting its theoretical implications (Holden & Kroner, 1992; Holden et al., 1992; Brunetti, 1994). However, thorough investigation is needed to further assess the universality and generality of this model, and to gain further knowledge of its applicability to various settings and with various populations. Particularly, the response latency expectations in a normal population are most probably different from those found in psychologically disturbed populations. The possible pattern and response latency differences thus call for further exploration and clarification.

Statement Of The Problem

Researchers in the area of assessment want to construct better, more reliable self-report inventories, or find ways to make the existing inventories even more reliable. In this particular domain, we can draw on the wealth of research that has already been conducted by cognitive psychologists to understand the mechanism of human responding, and apply those concepts to gain an understanding of the process of faking. However, this understanding is only beginning to take form and research in this area is in its infancy. The few studies published have both suffered from (e.g., Hsu et al., 1989) and focused on reducing (e.g., Holden, & Kroner, 1992) methodological problems typical of the explorations in any new area. For example, when making inferences about the psychological meaning of response latency differences, eliminating psychologically unrelated explanations, like the length of the item and item ambiguity, is extremely important (Rogers, 1977; Dunn, et al., 1972).

Whether to utilize a single versus a double standardization procedure constitutes an important methodological consideration. Holden and his colleagues at the Queen's University have consistently used a double standardization procedure to control for both item characteristics (e.g.,item length and ambiguity) and subject characteristics (e.g., reading speed). When item latencies are standardized, first, in relation to a norm group's latencies (i.e., to control for item characteristics), and second, for each subject's latencies on each item (i.e., subject characteristics), the resulting z-score transformation yields a mean latency of 0 and a standard deviation of 1 for each subject and for the items across all groups. Only within-inventory shifts, where one subscale takes longer to respond to relative to another, can be identified. The goals of the studies conducted by Holden and his colleagues have been to investigate relative latency differences between high scale-scoring subjects and low scale-scoring subjects (e.g.,Popham and Holden, 1990) and relative latency differences between subjects instructed to fake-bad, fake-good, or answer honestly.

On the other hand, Brunetti (1994) utilized a single standardization procedure (i.e., only item characteristics were statistically controlled for). A double standardization procedure was not used because absolute latency differences across the 370 items for the three instructional groups were of experimental interest.

As mentioned above, when statistically adjusting for subject characteristics, individual differences can not easily be identified. Only relative scale differences are subject to recognition. In the present study, identification of individual response latency differences is vital when seeking to answer the experimental questions posed (see below). Thus, a single standardization procedure was utilized to yield absolute as well as relative response latency differences.

Another methodological issue that has been allotted considerable attention is the concept of item ambiguity. Cairns and Hsu (1980) found that when ambiguity was eliminated by providing a biasing context for lexically ambiguous items, latency delays disappeared. The ambiguity of an inventory item was found to increase response latencies in a study of "difficult" and "standard" items on the MMPI (Hanley, 1962). Even though the degree of difficulty of responding to a given item may vary from individual to individual, ambiguity regarding the underlying meaning of an item can be reduced by making the item content-relevant (e.g., Turner & Fiske, 1968; Goldberg, 1963).

Also, whether the respondent is rejecting or accepting an item should be considered when grouping response latencies for analysis. Investigators have found that the decision to endorse or reject an item is closely related to the schema the subject is operating from (Popham & Holden, 1990, Holden et al., 1992).

Statement of Hypotheses

This research project explored the link between response latencies and faking from the perspective and framework of schema theory. Latencies for individuals with scale-elevations (i.e., T > 64) were compared to latencies for individuals with no scale elevations on the MMPI-2. Specifically, how these groups' latencies differed under honest, fake-bad, and fake-good instructions were explored. It was hypothesized that (a) individuals with MMPI-2 scale elevations would endorse items more quickly and reject items more slowly when taking the test honestly compared to individuals with no scale elevations. It was expected that the effect would be seen on the F scale, clinical scales 1-4, 6-9, and the obvious subscales. (Hypothesized differences on scales 5 and 0 were not made due to the conventional practice of excluding these scales as measures of psychopathology). The opposite pattern was expected for the L and K scales. It was also hypothesized that (b) latency differences would be found on basic scales as well as subtle/obvious subscales between individuals without and those with MMPI-2 scale elevations under faking conditions (i.e., the groups would differ in their attempts to dissimulate as manifested by their latencies). Furthermore, it was hypothesized that (c) individuals with MMPI-2 scale elevations would endorse items more quickly and reject items more slowly on the specific scales that were elevated as compared to their latencies on those scales without elevations after taking the test honestly. This hypothesis pertains only to scales 1-4, 6-9, and the obvious subscales.

Hypothesis b is stated in non-directional terms because of the limited data available. It was uncertain how the response latencies of subjects with elevations would be affected by instructions to fake when they presumably already have a psychopathology self-schema. Hypotheses a and c do not include subtle subscales when making directional predictions. It was unclear how ambiguous items affect latencies. Therefore, even though specific hypotheses are not stated for the subtle items, the exploration of their latency effects are an important aspect of this study. Because the between-group differences are of main experimental interest, no within-group hypotheses were postulated.

Before running the main analyses discussed above, preliminary analyses were run to determine how the instructions as well as group differences affected the

MMPI-2 basic _T_-scores. The _T_-score hypotheses were as follows: 1) subjects in the elevated group were expected to produce higher _T_-scores than the subjects in the nonelevated group on MMPI-2 _F_ scale, and clinical scales 1-4 and 6-9 in the honest condition, 2) between-group _T_-score differences were also expected for basic scales in the fake-good and fake-bad conditions. However, the directionality of these differences was not hypothesized because so little is known about how group membership influences faking, and 3) subjects in both the elevated and the nonelevated groups were expected to produce lower _T_-scores when faking good and higher _T_-scores when faking bad as compared to their honest responding on the _F_ scale, and clinical scales 1-4 and 6-9. The opposite pattern was expected for the _L_ scale, where subjects in both the elevated and the nonelevated groups were expected to produce higher _L_ scale _T_-scores when faking good as compared to the honest condition.

CHAPTER II

REVIEW OF THE LITERATURE

Stage Models

Psycholinguists and researchers investigating cognitive operations have proposed several stage models of human reaction time. These models have focused on isolating individual steps in the response process, thus opening the way for further examination of independent stages (Spoehr & Lehmkuhle, 1982). Understanding human information-processing when investigating response latencies in any area is of utmost importance. Particularly, making inferences due to motivational factors is possible only as long as extraneous factors are controlled. The stage models provide an opportunity for researchers to identify the different components and factors that come into play when responding to personality inventory items.

Donders' (1868) Subtraction Model

Because of the speed of human information processing, and because individual stages often cannot be performed in isolation, Donders (1868, [1969]) proposed the Subtraction method to estimate the amount of time necessary to execute a given stage. In this procedure, the subject performs the task twice, once including the target stage and once excluding the stage. The researcher then subtracts one from the other to compute reaction time. For example, when estimating the time it takes to eat the main course during a meal, record the time it takes to eat the meal with and without the main course. Then subtract response latency of the exclusive meal (i.e., without the main course) from the inclusive meal (i.e., with the main course) to obtain main course reaction time.

Sternberg's (1969) Additive Stage Model

One of the difficulties with Donders' model is that he did not account for the influence that adding one stage has on the reaction time (RT) of the other stages. Returning to the meal example, eating a main course is definitely going to influence the amount of dessert one eats; thus, reaction times for each stage are interdependent and unstable. Sternberg (1969) expanded on Donders' model by identifying the non-interactive stages in a response process when the stages are held constant. Reaction times are analyzed by the cumulative adding of additional items to the stage in question. This procedure is called the Additive Stage method. Experiments utilizing a binary-classification task illustrated his ideas. He had subjects engage in numerical comparisons subsequent to memorizing sets of digits. A positive response is made by the subject if the test digit is a member of the previously presented set of digits (i.e., the subject is able to correctly remember a digit when subsequently presented in a set of digits). Sternberg found that adding items to the set had a stable incremental (i.e., linear) effect on RT regardless of the size of the set.

Rogers' (1974a) Three-Stage Model

Extending the Additive Stage model to explain the process of responding to personality items, Rogers (1974a) postulated the presence of three stages: 1) Stimulus Encoding (Item length), 2) Stimulus Comprehension (Item ambiguity), and 3) Binary Decision (Item controversiality). Thirty university student volunteers responded to 200 personality items of varying length, ambiguity, and controversiality. Ambiguity was assessed along a 5-point rating scale and items were classified as either high (i.e., with a 2.52 average rating) or low (i.e., with a 1.88 average rating) in ambiguity. Further, an item was deemed controversial if the proportion of "true" responses to the item was around 0.5. For each subject, the mean RT for items of varying length, controversiality, and ambiguity was subjected to analyses of variance with repeated measures on each variable (e.i., three ANOVA's analyzed the relationships between, and main effects of, the three proposed stages). The results showed that the three stages are additive with respect to reaction time, with no interaction effects and consistent main effects.

Conclusion

Moving from the Additive Stage model developed to explain human reaction times to the model proposed by Rogers specifically addressing the process of inventory item responding has made it possible to examine each factor that influences item response latencies in isolation. These factors (i.e., item length, item ambiguity, item controversiality) will be discussed below, starting with item controversiality, the component influenced by motivation.

The Binary Decision Stage

Rogers (1974b) extended his work by focusing on the Binary Decision stage (item controversiality). This stage is of major interest for personality assessment, because factors leading to individual differences (e.g., intent to deceive, response styles, and response sets) as well as item position play a much stronger role at this stage than the other stages.

Rogers (1974b) separated the Binary Decision stage into two component stages, the Self-Referent Decision (SRD) and the Response Selection. The subjects in his study were 24 introductory psychology students. Classifying controversiality as either high or low, Rogers found that the number of response alternatives (2 or 5) did not interact with controversiality. He therefore concluded that the proposed substages (i.e., the SRD and the Response Selection) were independent of each other. Only the SRD is influenced by item controversiality.

The Self-Referent Decision

This is the stage where an individual compares the item at hand to information stored in memory. When the decision involves the self (i.e., when the person has to decide whether or not the item applies to him/herself), reaction times are manifestations of the controversiality of the item (i.e., the congruence between the person and the item; Rogers, 1974b). Motivational factors, such as the intent to deceive, influence and may alter the process of responding at this stage.

The Response Selection

This stage is influenced by the response format of the inventory (e.g., true-false, likert-type scale), and occurs subsequent to decision-making. For example, when a respondent decides that an item is representative of him/herself, the true or mostly true response option will be selected. Even though between-inventory variations may occur (i.e., reaction time difference between a test with few response options versus one with many), within-inventory variability is minimal and reaction time remains stable.

Conclusion

Because the response selection stage of a given inventory has a constant effect on reaction time, only the SRD and item controversiality will be subjected to further examination. Kuiper (1981) proposed that the SRD is a process by which a schema about the "self" has been activated. This leads to an exploration of schema theory, a theory that has received a lot of attention and recognition in personality research.

Schema Theory

Responding to personality inventories involves accessing information in memory referred to as the "self-schema" (Kuiper, 1981). Biederman (1981) defined a schema as "an overall representation [in memory] that serves to integrate all the separate aspects of the [construct]" (p. 169). Self-schema or schemata is defined by Markus (1977) as the "cognitive generalizations about the self, derived from past experiences, that organize and guide the processing of self-related information" (p. 63).

Self-schema and SRD

Rogers (1977) proposed that when making self-referent decisions, an elaborate memory structure is activated, referred to by Markus (1977) as a self-schema. He investigated the effectiveness of accessing this memory structure. Subjects were presented with either first- or third-person items and instructed to reference the "self" or given no instructions. On a subsequent recognition task, subjects who completed the first-person questionnaire and were instructed to make a self-referenced decision, made the least number of recognition errors compared to subjects who answered a third-person questionnaire and were given no instructions to access the "self." The investigator, in a related experiment, also found that individuals automatically reference their self-schema when responding to first-person personality items. He further concluded that accessing a self-schema appears to involve deeper and more elaborate processing.

Self-Schema and response latencies

Because individuals process information differently when they access a self-schema compared to when they do not, several investigators have explored the link between schema theory and its effect on latencies. Rogers, Kuiper and Kirker (1977) found that subjects who engaged in self-referenced tasks took longer to respond than subjects who completed a semantic task that involved more shallow levels of processing. Subjects in their study rated 40 adjectives in one of four experimental tasks. Each task forced varying degrees of encoding (i.e., structural, phonemic, semantic, and self-referenced). In addition to producing longer latencies, the adjectives in the self-referenced task were recalled better.

However, Markus (1977) found accessing a self-schema facilitated the endorsement of schema-relevant items. He grouped subjects based on how "independent" or "dependent" they rated themselves and subsequently presented lists of trait adjectives associated with independence and dependence. The subjects were significantly quicker in responding to items that were consistent with their self-schema than items that were not. For example, both "dependents" and "independents" rated themselves as independent, ambitious, and individualistic. However, it took the "dependents" significantly longer to respond to these adjectives.

Conclusion

Whether accessing a self-schema facilitates or prolongs the process of responding is at this point inconclusive (Rogers, 1974b; Markus, 1977). However, response latencies during the SRD are doubtlessly influenced by having subjects access a self-schema. Another factor that has an effect on response latencies at this stage is the congruence between a subject's schema and the item at hand (i.e., item controversiality). This discussion will now focus on how both subject position (i.e., the test-taker's personal view of the item content) and item position (i.e., how controversial the item content is to the subject), as well as ambiguity as an item property, influence responding.

More on Controversiality, and Ambiguity

Returning to Rogers' (1974a) three-stage model, the second stage he found to be additive with respect to reaction time is the comprehensiveness or ambiguity of inventory items. The more ambiguous a test item is, the longer the response latency. Further, when the longer latency is attributable to test characteristics, individual variations are concealed. Thus, if inferences are to be made about individual or group differences, the influence of item ambiguity on latencies needs to be addressed.

Even though Rogers (1974a) found item controversiality and item ambiguity to be additive with respect to reaction time, few investigators have separated subject traits (e.g., motivation, or degree of psychological disturbance) and subject position from item characteristics when examining item ambiguity. Following a general discussion of subject versus item position, ambiguity and test stability, an argument will be made for how item position influences latencies at the Binary Decision stage (Rogers, 1974b), whereas ambiguity is an extraneous factor at this stage.

Item position versus subject position

Kuiper (1981) investigated reaction time during a self-referenced task and found that adjectives that were judged as extremely like or extremely unlike the self were responded to much quicker than adjectives that were only moderately descriptive. Thus, both the characteristics of the subject and the position of the item exert influence upon latencies.

Kuncel (1973) scaled both subjects and items along the same dimension and proposed that the closer the item is to the respondents' threshold, the longer the response latency. The subjects identified their item position prior to answering personality inventory items. The threshold was defined as the point where the respondent is equally likely to respond false as s/he is to respond true. She gave the following example of her model:

> Consider a subject who is asked to respond to a series of items concerning the age at which citizens should be permitted to vote-"at 10?""at 11?" up to "at 29?" "at 30?" For items dealing with ages from 10 to 15 and from 25 to 30, the answers for the typical subject are quite clear, and the reasoning is virtually spontaneous. Around ages 18 to 21, however, he has to weigh carefully a number of factors, such as the importance of the vote and the average maturity level of each age group. The "nearer" the items are to the subject's approximate position on the issue, the harder it is for him to make a

> decision, [and] the more carefully he must weigh the alternatives. (pp.545-546)

The investigator also found that as the subjects approached their threshold, inappropriate response strategies (e.g., random responding) were applied.

Stability

Turner and Fiske (1968) also found that test respondents frequently engage in inappropriate response processes, and that homogeneity of items, as it relates to the construct validity of the test, is an important aspect of assuring item and test quality. Fiske's (1968) model of inventory responding is similar to Kuncel's theory in that he argued that the stability of a response is related to the absolute distance between the item point and the person point. He argued that a response tends to be more stable when it is made by a person whose point is more distant from the item point. When a person encounters an item, the interactive process depends upon both the item and the person.

Goldberg (1963) proposed that the stability of any item depends upon both the narrowness of the position of the item and the extremeness of the item on an attribute continuum. Instability exists when the perceived position of the item varies from subject to subject. He also argued there is more hesitation in answering and less test-retest stability when the item is considered ambiguous.

Conclusion

The purpose of the above discussion was twofold. First, it introduced item position as an important aspect of making self-referenced decisions, thus expanding the self-schema framework. Second, it explored both item controversiality and item ambiguity as factors that influence the process of responding. Implications for response latency research are that instability due to item controversiality affects latencies at the Binary Decision stage, whereas instability due to item ambiguity has an effect on latencies at the Stimulus Comprehension stage (Rogers, 1974b).

Research on stability at the Binary Decision stage has shown that there is a point where responding is unstable (i.e., when both the person and the item are close to a threshold; Turner, & Fiske, 1968). A major factor that influences latencies at this stage is the traits and characteristics the test-taker references when deciding on the congruence between the item and the schema.

At the Stimulus Comprehension stage, the stability of a response is influenced by item ambiguity. In contrast to controversiality, which involves subject and item position, item ambiguity refers to the meaning of the item itself. Response latencies attributable to this stage are independent of those that accrue at the Binary Decision stage (Rogers, 1974b). Further, this is where the subject is attempting to gain an understanding of the item s/he is responding to without necessarily accessing information about the self. Ambiguity can be reduced by utilizing and developing content-relevant tests (Turner & Fiske, 1968), which in turn may improve the predictive power of latencies.

Item Length

The first stage in Rogers' (1974b) model addresses item length. Dunn, Lushene and O'Neil, Jr. (1972) found that item length alone accounted for 47% to 58% of the response latency variance on the MMPI. In order to control for this effect, statistical methods have been applied. When investigating the ability of response latency differences to assess psychopathology, Holden, Fekken and Cotton (1991) came up with a standardization procedure to statistically control for item length, as well as item ambiguity, order of presentation, vocabulary level, gender, and reading speed. This procedure will be discussed later.

Conclusions

The above review of information-processing literature pertaining to reaction time has provided a frame-work for further exploration (i.e., schema-theory), as well as brought to awareness several issues (e.g., item ambiguity, item length) one needs to control for when researching response latencies. Keeping this information in mind, a review of the literature that seeks to predict individual response latency differences follows.

Prediction Models

Under Standard Instructions

Response latency research has recently been extended to the field of assessment (e.g., Popham & Holden, 1990; Fekken & Holden, 1992). Response latencies are believed to be the behavioral manifestations of the response process (Rogers, 1971). Therefore, investigating individual differences in response latencies as possible predictors of personality dimensions were the focus of Popham and Holden's (1990) study. Subject position (high versus low) on the MMPI content-based scales (Costa, Zonderman, Williams, & McCrae, 1985), as well as the traditional clinical scales, were compared to scale-specific response latencies for psychopathologically endorsed and rejected items. Each subject's position was based on the total scale score. Compared to subjects scoring low on a scale, subjects scoring high on a given scale were found (a) to produce shorter response latencies when endorsing items on that scale, and (b) to produce longer response latencies when rejecting items on the same scale. The investigators concluded that these findings supported a self-schema model of responding to personality inventory items in that incoming information is compared to a relevant self-schema. The schema-relevant items are quickly endorsed, and slowly rejected. This was found to be true for the content-based scales only (Costa et al., 1985). The traditional, clinical scales did not correlate with response latencies in a similar pattern. The clinical scales on the MMPI consist of both subtle (content-irrelevant) and obvious (content-relevant) items. Inappropriate response strategies (Kuncel, 1973) may have been used when answering the more ambiguous subtle items. This lends support to Turner and Fiske's (1968) argument that homogeneity of items to test construct (e.g., psychopathology) is important to consider when response latencies are measured.

Another important question raised by the Popham and Holden (1990) study is the possible ability to predict a person's relative standing on a given dimension by his or her response latencies on that dimension. Holden, Fekken, and Cotton (1991) set out to examine the relationship between response latencies and scale scores on the Basic Personality Inventory (BPI; Jackson, 1986) utilizing both college student and psychiatric patients as subjects. They found that subjects who scored high on the dimension measured by a given scale obtained significantly shorter response latencies on items for that scale as compared to subjects with no elevations. Their findings generalized across different scales and factors, and again indicate that the presence of a self-schema facilitates processing.

Fekken and Holden (1992) continued to investigate the relationship between response latencies, personality inventory responding and schema theory. They proposed that when individuals respond to personality tests, their response pattern is a manifestation of internal traits. The objective of their study was to show that, in spite of theoretical differences, personality traits and self-schema can be combined into a single framework. The traditional theoretical differences consist of traits being scaled along a dimension (degree of presence), while a self-schema is conceptualized dichotomously (either/or). During the first part of their study, utilizing 105 university students as subjects, they demonstrated that positions on various dimensions of psychopathology (i.e., high versus medium versus low scores on the BPI scales) determined scale-specific response latencies. High-scoring subjects endorsed items significantly more quickly on that scale, while rejecting items significantly more slowly when compared to low-scoring subjects. During the second part of their study, utilizing 55 undergraduates as subjects, the subjects' self-schema was determined by self-ratings on pairs of adjectives related to each of the content dimensions on the Personality Research Form (PRF; Jackson, 1984). A significant relationship was found between adjective self-ratings and scores on the corresponding PRF scale, thus supporting their proposition that the presence of a trait as measured by an inventory also signals the presence of a self-schema.

Summary

The development of schema-related theories (Markus, 1977; Rogers, 1971) and postulates concerning person versus item position in regard to stability (Fiske, 1968) and reaction time (Kuiper, 1981) have led to new discoveries in the area of personality assessment. Researchers are now applying a theoretical framework to explain the process individuals engage in when responding to personality inventory items. The individual compares personality items to his/her self-schema. If a given item is schema-congruent, rejecting the item becomes a slower process than accepting the item. Additionally, if the person feels strongly that something is true or false as related to the "self" (person position) and the item at hand either strongly describes or does not describe the person (item position), then the response latency for endorsing the item is shorter than when the two positions are less extreme (i.e., closer to the threshold). Several investigators have also applied response latency theories to explain the process of faking (Hsu et al., 1989; Holden & Kroner, 1992; Holden et al., 1992; Brunetti, 1994).

Under Faking Instructions

Hsu et al. (1989) investigated the faking-detection ability of reaction times to the MMPI. Undergraduates were assigned to groups with different instructional sets (honest, fake-good, and fake-bad). Raw item response latencies were computed for the Obvious and Subtle subscales (Christian, Burkhart, & Gynther, 1978) and averaged. The endorsement pattern was not grouped for analysis. The investigators found that subjects who were instructed to fake (both fake-good and fake-bad) consistently produced shorter response latencies than subjects who were given standard instructions. Even though the investigators concluded that their findings seemed consistent with several response process theories (i.e., Goldberg, 1963; Kuncel, 1973; Rogers, 1971; Rogers et al., 1977; Nowakowska, 1970), no attempts were made to control for item ambiguity, item length, and other confounding variables. Holden et al. (1992) strongly criticized investigators for using raw response latencies, and for not analyzing the pattern of endorsement.

Holden et al. (1992) elaborated their self-schema model for responding to personality inventory items to explain the process by which individuals fake. The model postulates that when subjects are instructed to fake, they adopt a "faking" schema that influences their responses as well as their speed of responding. The adopted-schema works like a self-schema, in that schema-relevant items are quickly endorsed, and slowly rejected. Using university students as their subjects, results showed an interaction effect between faking and endorsement, thus supporting their adopted-schema model. The effect was found using the MMPI clinical and validity scale items as well as the items on the BPI. These results contradict Popham and Holden's (1990) study that failed to find an association between MMPI clinical scale items and response latencies. The investigators used a double-standardization procedure (Holden, Fekken, & Cotton, 1991) to statistically control for item length, item ambiguity, order of presentation, vocabulary level, gender, and reading speed. This z-score standardization procedure involves the adjustment of latency means and standard deviations across MMPI items for each subject, and within each MMPI item in the standard condition. Standardization across items for each subject corrects for confounding individual differences such as reading speed, while within-item standardization corrects for confounding stimulus characteristics such as item length.

Holden and Kroner (1992) utilized maximum security prison inmates during their investigation of how well response latencies can differentiate among inmates who are instructed to dissimulate. They also compared the relative efficacy of differential response latencies to other faking indices. Eighty-seven subjects voluntarily completed the BPI under fake-good, fake-bad, and honest conditions. The investigators found that differential response latencies can significantly discriminate between subjects who were given faking versus standard instructions. The results yielded an overall classification hit rate of 59.77%. Inmates who were faking good took longer to endorse psychopathological items as compared to inmates who were not faking good. Also, inmates who were faking bad took longer to reject psychopathological items than inmates in the other conditions. Further, subjects in both faking conditions took longer to reject items as compared to subjects in the honest condition. When looking at the correct classification rate of differential response latencies compared to other indices utilized on the BPI (i.e., the BPI denial scale, the BPI self-depreciation scale, the Marlowe-Crowne Social Desirability Scale; Crowne & Marlowe, 1960, the Edwards Social Desirability scale; Edwards, 1957) all scales were about equally successful (i.e., classification hit rates between 55.17% and 65.96%). Combining the four indices yielded a rate of 83.91%. Adding the differential response latency measure to these scales did not, however, yield statistical significance. The investigators utilized the z-score standardization procedure discussed above before analyzing their results.

Brunetti (1994) had introductory psychology students respond to a computerized version of the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) under fake-good, fake-bad, and standard instructions. The MMPI-2 was deemed more appropriate than the MMPI, because of the general expectation that the revised and renormed version of this instrument will replace the old version. The focus of Brunetti's study was to examine the theories which relate faking and reaction time, and he proposed that more research is needed to establish what theory best fits the empirical findings. Similar to Holden et al. (1992), Brunetti found several methodological difficulties with the few empirical studies (e.g., Hsu et al., 1989) that have been published linking response latency differences to instructional sets (i.e., faking). In accordance with the groupings of Holden and his colleagues, Brunetti looked at the endorsement pattern of responding (i.e., the subject endorses an item when the "true" or "false" responding is scored for psychopathology, and rejects an item when the "true" or "false" responding is not scored for psychopathology). He also statistically controlled for item characteristics (e.g., item length) on the MMPI-2. However, a double standardization procedure was not used. Individual subject characteristics were controlled through random assignment of subjects to groups. The author further assumed homogeneity of reading speed in his college sample. In accordance with Hsu et al. (1989), Brunetti grouped latencies using subtle and obvious item distinctions. However, he used Wiener and Harmon's (1946) subtle and obvious ratings, not the less commonly used ratings of Christian, Burkhart and Gynther (1978) used by Hsu et al. (1989).

The results showed that for subjects faking bad, it took significantly less time to accept items from scales composed of many psychopathological items than it took to reject those items. Fake-bad subjects also spent more time accepting items that were positive or psychopathology-unrelated (i.e., L-scale items), with the opposite pattern being true for the honest and fake-good responders. These findings strongly support the previously discussed facilitory effects of accessing a self-schema as proposed by Markus (1977) and are in direct contradiction to the theoretical positions of Rogers (e.g., Rogers, Kuiper, & Kirker, 1977), who postulated that items which are representative of an individual would take longer to process. The subtle/obvious analysis revealed significant differences for the rejected items only. The fake-bad subjects took significantly longer to reject obvious items than the subtle items, with the opposite pattern being true for the fake-good group. These results also fit within the schema theory framework of Markus (1977). Because the subtle items are more socially desirable (Christian et al., 1978), the subjects faking bad are more hesitant in endorsing these items, while the subjects faking-good are more willing to endorse these items.

Summary

Similar to the studies investigating latency differences under standard instructions, the four empirical studies (Hsu et al., 1989; Holden et al., 1992, Holden & Kroner, 1992; Brunetti, 1994) investigating latency differences under faking instructions have all attempted to explain their results within a theoretical framework. The schema theory (Markus, 1977) appears to best fit the empirical data; subjects who are instructed to fake adopt a faking schema that serves as a reference for making decisions (Holden et al., 1992). Nevertheless, the faking detection ability of latencies does not seem to add any unique information over and above that already accounted for by various faking detection indices (Holden & Kroner, 1992). However, latency expectations for various populations need to be established before long or short latencies can be said to represent an abnormal indication of dissimulation. For example, a depressed individual who already has a "depressed" self-schema is expected to respond quicker than non-depressed individuals to items dealing with depression and may take longer before rejecting an item dealing with depression. The same individual may also have a harder time than non-depressed individuals in adopting a fake-good schema when responding to items drawing on depression. The studies conducted so far have not investigated the influence of pre-existing personality characteristics or psychopathology on adopting a schema. The moderate classification hit rate found in the Holden and Kroner (1992) study may therefore be due to having obtained inadequate and limited information about the sample at hand.

CHAPTER III

METHOD

Subjects

Subjects were 48 undergraduate introductory psychology students (30 females, 18 males) from a state university in the Southwest United States. Two subjects were dropped from the study due to response latency exclusion criteria; they responded faster than .05s to more than 50 items on any given MMPI - 2 administration (more details about the exclusion criteria are provided below). Participants were screened for psychopathology. All students scoring in the elevated range (i.e., _T_-score >62) and an equal number of students scoring in the normal range on a screening instrument (i.e., The Brief Symptom Inventory; Derogatis, 1993) were contacted by an experimenter and asked to complete three MMPI-2 questionnaires. Volunteer student recruiting was continued until an equal number of subjects scored in both the elevated (_T_-score >64 on at least one of the clinical scales 1-4 and 6-9 only) and normal ranges on the MMPI-2, thus making up the two experimental conditions. Only MMPI-2 elevation, not BSI elevations, were considered pertinent when making decisions about group membership. A proportional number of males and females (62.5% female, 37.5% male) were included in each group. The subjects received one extra credit point per hour of participation.

Instruments and Apparatus

The Inventory

One measure of personality and psychopathology that has been easy to computerize due to its format and limited response options (Butcher, Keller, & Bacon, 1985) is the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & Kinley, 1967). It is the most widely used personality questionnaire today (Murphy & Davidshofer, 1991). The MMPI has a number of validity indices associated with it to detect faked profiles (e.g., *L*, *F*, and *K*).

Several studies have utilized the MMPI as their instrument of choice when studying response latencies (Hsu, et al., 1989; Holden et al., 1992; Dunn et al., 1972; Popham & Holden, 1990). As discussed above, the MMPI was recently revised and renormed (MMPI-2; Butcher et al., 1989). Because the MMPI-2 is expected to replace the original inventory, the revised version was utilized in this research project.

The short form of the MMPI-2 (i.e., the first 370 items) was administered, precluding the scoring of the content-based scales (Costa et al., 1985). However, comparisons was made between the obvious and subtle subscales on the inventory, thus addressing the question of how content-relevant versus content-irrelevant items influences response latencies.

The Brief Symptom Inventory

The Brief Symptom Inventory (BSI; Derogatis, 1993), a 53-item self-report inventory, is essentially the brief form of the Symptom Distress Checklist (SCL-90; Derogatis, 1977). Similar to the SCL-90, it is conceived as measuring 9 primary symptom dimensions (i.e., Somatization (SOM), Obsessive-Compulsive (O-C), Interpersonal Sensitivity (I-S), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY)). The BSI also measures three global indices of distress: 1) the General Severity Index (GSI), 2) the Positive Symptom Distress Index (PSDI), and 3) the Positive Symptom Total (PST). The normative samples include 1,002 adult psychiatric outpatients, 423 adult psychiatric inpatients, and 974 adult non-patients. Internal consistency and test-retest reliability (i.e., Cronbach's coefficient alpha ranging from .68 to .90), as well as the validity of the BSI (i.e., high correlations with the SCL-90 and the MMPI), appear adequate (Derogatis, & Melisaratos, 1983). A *T*-score of 63 and above on the GSI was considered elevated.

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2)

The Minnesota Multiphasic Personality Inventory - 2 (MMPI-2; Butcher, et al., 1989) was used when measuring item response latencies. T-scores and response latencies for the three validity scales (L, F, K) and the ten clinical scales (Hs, D, Hy, Pd, Mf, Pa, Pt, Sc, Ma, Si) were computed. The Wiener and Harmon (1946) subtle and obvious subscales on the D, Hy, Pd, Pa, and Ma scales were also calculated. Only the first 370 items of the MMPI-2 are needed to score the above scales.

The MMPI-2 items are protected by copyright laws and were presented with permission by the University of Minnesota. Items were displayed on a 9-inch green screen monitor controlled by an IBM-compatible computer and BASIC program. The computer also recorded true/false responses and gathered response latencies. Subjects were familiarized with the computer, and a sample item was presented. They were told to press "1" for "true" or "mostly true" responses and "2" for "false" or "mostly false" responses. They were then required to respond to the sample item: "I like to walk my dog." Then the test items were administered. A second BASIC program computed z-scores for each of the 370 items by subtracting the item's mean latency, obtained from responses to items when subjects were instructed to respond honestly, and dividing the result by the corresponding standard deviation. The same procedure was utilized for all the items in this study. The program further adjusted for outliers by converting latencies less than 1s to 1s. Latencies greater than 20s were reduced to 20s. The number of adjusted low scores and number of adjusted high scores were computed for each subject. According to Brunetti (1994), cutting scores below 1s and above 20s affect one percent of the total latency scores. The program also calculated validity, clinical, and subtle-obvious T-scores and mean z-scores for each scale. In addition, mean response latency z-scores were calculated for accepted items, rejected items, and total (accepted plus rejected) items on each of the validity, clinical, and subtle-obvious scales.

Procedure

All subjects took the MMPI-2 individually. Each subject took the test three times: with standard instructions, with fake-good instructions, and with fake-bad instructions. Even though taking the test more than once will drastically affect latencies for subsequently administered tests, the within-subject design was a more efficient way to utilize available subjects. Order effects were controlled for by completely counter-balancing the order of administration (i.e., each of the six possible combinations of instructional sets was equally represented for elevated and non-elevated groups).

Complete confidentiality was assured by keeping the identity of the subjects separate from their MMPI-2 responses. Each subject was assigned a number to be entered into the computer. The information linking this number to a name was safely locked away while the experiment ran, and destroyed upon completion of data collection.

Upon arrival, subjects read and signed an informed consent statement (see Appendix D). Inventory items were presented individually on the computer monitor and subjects were told to press the space bar after responding to each item, thus advancing them to the next item. Only "true" and "false" answers were permitted ("1" = "true," "2" = "false") due to the recording of response latencies. Brunetti (1994) concluded that because no comparisons were made to paper-and-pencil administered inventories, omission of the "cannot say" response, and subjects' ability to review their responses, was not problematic.

Due to the possibility that some subjects may not take the test in a serious fashion or may for one reason or another experience time pressure, the following exclusion criteria were applied to all subjects during all three conditions; if a subject responded too quickly to 50 or more items in any one condition, s/he was excluded from the study (the number was decided upon after perusal of the T-scores of "too quick" test-takers revealed an apparent randomness of responding). Any item's response latency of less than

.05s was deemed "too quickly" (the BASIC program discussed above automatically tabulates this number).

Subjects received instructional sets congruent with the group and order of condition to which they had been assigned. The instructional sets were identical to those used by Brunetti (1994) and were presented to the subjects on the computer screen prior to each inventory administration. When taking the test honestly, subjects received the following instructions:

> I am interested in the characteristics of the student body at this college and I want you to take a personality test for me. Because I am interested in group characteristics I do not want you to enter your name with your responses. Do, however, accurately record your gender. In short, I want you to take this test in an honest but anonymous fashion. (p. 41).

When faking bad, subjects received these instructions:

> I want you to imagine a situation in which you are being cast in an adversary relationship against a psychologist. More specifically, imagine a situation in which it would be to your advantage to appear as if you were mentally disturbed. Examples of such a situation could

> be: applying for rehabilitation services, trying to qualify for disability benefits, or trying to beat a legal charge on grounds of insanity. In short, I want you to take this test and deliberately fake bad, so that your deception could not be detected by a professional psychologist. (p. 42)

When faking good, subjects received these instructions:

> I want you to imagine a situation in which you are being cast in an adversary relationship against a psychologist. More specifically, imagine a situation in which it would be to your advantage to appear as if you were completely normal and sane. Examples of such a situation could be: trying to secure an early release from prison, trying to secure a release from a mental hospital, or applying for a good job. In short, I want you to take this test and deliberately fake good, so that your deception could not be detected by a professional psychologist. (p. 43)

Subsequent to the completion of the MMPI-2, all subjects were debriefed on the nature and objectives of the study. All subjects were further told that if they found any of the items on the MMPI-2 to be upsetting and/or if they felt they had some personal problems they would like to discuss with someone, there are facilities on campus that provide psychological services. Written information about agencies on campus and in the community were provided to all subjects.

CHAPTER IV

RESULTS

MMPI-2 T-score Findings

To test hypotheses 1, 2, and 3 predicting *T*-score differences between groups and within conditions, an overall multivariate analysis of variance (MANOVA) was run. Independent variables were group (elevated versus nonelevated) and condition (honest, fake-good, fake-bad). *T*-scores on the 13 basic scales served as dependent measures. Using the Wilk's Lambda criterion, results revealed a significant overall group effect, $F(13,34) = 2.68$, $p < .01$, a significant condition effect, $F(26,160) = 46.80$, $p < .0001$, and a group by condition interaction effect, $F(26,160) = 2.64$, $p < .0001$. Univariate analyses were performed, and error terms (pooled error terms were used when paired samples' *t*-tests were to be performed) from these analyses were used in subsequent *t*-tests. Hypothesis 1 predicted differences between the elevated and nonelevated groups in the honest condition on 8 clinical scales as well as the *F* scale. Student's *t*-tests (one-tailed for scales *F*, 1-4, and 6-9, and two-tailed for scales *L*, *K*, 5, and 0) showed that subjects in the elevated group scored significantly higher than subjects in the nonelevated group on all MMPI-2 basic scales but L, K, and Mf when taking the test honestly. Further, subjects in the elevated group scored significantly lower than subjects in the nonelevated group on the K scale when taking the test honestly.

Hypothesis 2 predicted differences between the elevated and the nonelevated groups in the fake-good and fake-bad conditions. The results of two-tailed *t*-tests revealed only two significant differences for the fake-bad condition. Subjects in the nonelevated group had higher *T*-scores than subjects in the elevated group on the Pa as well as the Si scales. Detailed information about means and differences among means are provided in Table 1.

Table 1

Mean K-corrected T-scores by Group and Condition

		Condition		
Dep.Var.	Group	Honest	F-G	F-B
L	Elevated	44.92[a]	74.21[b]	50.00[a]
	Nonelevated	46.38[a]	78.88[b]	45.25[a]
F	Elevated	63.88[1a]	48.46[b]	117.00[c]
	Nonelevated	49.00[2a]	46.42[a]	120.00[b]
K	Elevated	41.38[1a]	57.63[b]	37.33[a]
	Nonelevated	47.58[2a]	62.21[b]	32.92[c]
Hs	Elevated	55.88[1a]	50.33[a]	85.46[b]
	Nonelevated	45.50[2a]	48.21[a]	90.08[b]

Table 1 /contd.

Dep.Var.	Group	Condition: Honest	F-G	F-B
D	Elevated	52.71^{1a}	46.50^{b}	82.04^{c}
	Nonelevated	43.58^{2a}	43.42^{a}	86.29^{b}
Hy	Elevated	51.63^{1a}	47.88^{a}	78.67^{b}
	Nonelevated	43.38^{2a}	49.29^{a}	80.79^{b}
Pd	Elevated	56.67^{1a}	47.83^{b}	87.71^{c}
	Nonelevated	44.96^{2a}	45.21^{a}	92.75^{b}
Mf	Elevated	55.92^{a}	55.67^{a}	69.96^{b}
	Nonelevated	51.71^{a}	56.58^{b}	70.21^{c}
Pa	Elevated	52.83^{1a}	49.79^{a}	109.75^{1b}
	Nonelevated	45.92^{2a}	49.58^{a}	116.33^{2b}
Pt	Elevated	59.04^{1a}	48.46^{b}	89.04^{c}
	Nonelevated	46.13^{2a}	46.42^{a}	93.04^{b}
Sc	Elevated	64.33^{1a}	51.13^{b}	114.29^{c}
	Nonelevated	43.79^{2a}	47.79^{a}	119.29^{b}
Ma	Elevated	67.67^{1a}	52.42^{b}	85.71^{c}
	Nonelevated	49.75^{2a}	50.71^{a}	84.83^{b}
Si	Elevated	49.83^{1a}	40.71^{b}	68.83^{1c}
	Nonelevated	44.42^{2a}	38.08^{b}	75.73^{2c}

Note. Different numbers on the same vertical line denote significant differences between the elevated and the nonelevated group using Student's *t*-statistic (*df* = 138, *p* <.05). Different letters on the same horizontal line denote significant differences between conditions using Student's *t*-statistic (*df* = 92, *p* < .02).

To test hypothesis 3, Student's *t*-tests were performed on within-group *T*-score differences for both the elevated and the nonelevated groups. Subjects in both groups were expected to produce lower T-scores when faking good and higher T-scores when faking bad on the F scale and clinical scale 1-4 and 6-9, with the opposite pattern expected for the L scale. One-tailed t-tests were performed on all predicted differences, whereas two-tailed t-tests were utilized when testing differences on scales K, Mf, and Si. Because comparisons were made among three means (i.e., honest, fake-good, and fake-bad), the family-wise error rate was controlled (i.e., .05 was divided by 3). For the elevated group, subjects scored higher when faking bad than when they took the test honestly or faked good on all basic scales but L and K. On scales L and K, subjects scored higher when faking good as compared to both the honest and the fake-bad condition. Significant differences between the honest and the fake-good conditions were also found on several clinical scales, including D, Pd, Pt, Sc, Ma, and Si. On all of these scales, subjects scored higher when responding honestly than when faking good (see Table 1).

For the nonelevated group, Student's t-tests revealed subjects scored higher when they were faking bad than when taking the test honestly or faking good on all basic scales but L and K. Further, the nonelevated subjects scored higher when faking good than when taking the test honestly or faking bad on both the L and the K scales (these results closely mirror the results for the elevated group). Other differences between the honest and the fake-good conditions for the nonelevated group were that subjects scored higher when faking good than when responding honestly on the Mf scale with the opposite found for the Si scale (see Table 1). No other clinical scale differences were found.

MMPI-2 Response Latency Findings

Subsequent to the analyses of T-scores, the main analyses exploring response latency differences were undertaken (hypotheses a and b). First, latencies for accepted items on the MMPI-2 basic scales were investigated, followed by investigation of rejected items' response latencies, and total items' response latencies. Thus, three overall MANOVA's were run. Independent variables were group (elevated/nonelevated) and condition (honest/fake-good/ fake-bad). For the first MANOVA, the dependent variables were accepted items' latencies for the 13 basic scales. Using Wilk's Lambda criterion, this 2 (group) X 3 (condition) MANOVA revealed a significant overall effect for condition only, $F(26,160) = 2.88$, $p < .0002$. The second MANOVA utilized the rejected items' latencies for the 13 basic scales as dependent variables, revealing an overall condition effect only, $F(26,160) = 4.05$, $p < .0001$. Finally, an overall condition effect was also found for the 13 basic scales' total latencies ($F(26,160) = 3.62$, $p < .0001$).

Thus, all three of the overall MANOVA latency analyses revealed condition main effects only. Several other studies have documented the response latency effects of instructing subjects to fake (e.g., Brunetti, 1994). Further, between-group differences were of major interest in this study, and no hypotheses were proposed as to what the within-group differences might be. Thus, pairwise comparisons using the Neuman-Keuls' procedure were used if a significant condition effect was also found in the subsequent univariate analysis. Results from these analyses will be presented after those involving hypothesized differences.

The first major question of this study relates to hypotheses a and b. Briefly restated, do individuals with elevated scores respond differently than individuals with no MMPI-2 scale elevations in terms of their latencies when answering personality inventory items? Student's _t_-tests were performed for each condition (i.e., honest, fake-good, and fake-bad; error terms were drawn from univariate analyses). In order to control for the family-wise error rate when making comparisons between groups at each level of instruction, the significance level was set at .02 (i.e., .05 was divided by 3), thus treating the different types of latencies (i.e., accepted, rejected, and total) as a family. When testing for response latency differences between subjects with elevated MMPI-2 scores and subjects with no elevations on clinical scales in the honest condition (hypothesis a), student's t-tests (one-tailed for all scales but Mf and Si) revealed no significant differences for accepted items. For the fake-good condition, t-tests (two-tailed) indicated subjects in the elevated group responded significantly slower than subjects in the nonelevated group when accepting items on the D scale (see Table 2). No significant differences were found for accepted items in the fake-bad condition.

Table 2

Mean Response Latency Z-scores for Accepted Items by Group and Condition

		Condition		
Dep. Var.	Group	Honest	F-G	F-B
L	Elevated	.13	.16	.78
	Nonelevated	.25	-.04	.78
F	Elevated	.34	.61	.39
	Nonelevated	.29	.07	-.15
K	Elevated	.08	.02	.08
	Nonelevated	-.10	-.29	-.18
Hs	Elevated	.16	.02	.32
	Nonelevated	.00	-.26	-.19
D	Elevated	.11	.15[1]	.16
	Nonelevated	-.10	-.31[2]	-.19
Hy	Elevated	.11	.12	.20
	Nonelevated	-.03	-.23	-.20

Table 2 /contd.

Dep. Var.	Group	Condition: Honest	F-G	F-B
Pd	Elevated	.05	.25	.00
	Nonelevated	-.03	.01	-.18
Mf	Elevated	.08	.14	.28
	Nonelevated	-.02	-.22	-.19
Pa	Elevated	.11	.18	.08
	Nonelevated	.02	-.27	-.26
Pt	Elevated	.13	.24	.08
	Nonelevated	-.06	.06	-.34
Sc	Elevated	.18	.18	.13
	Nonelevated	.10	-.16	-.25
Ma	Elevated	.05	-.02	.05
	Nonelevated	-.07	-.16	-.37
Si	Elevated	.10	.18	.11
	Nonelevated	-.03	-.17	-.20

Note. Different numbers on the same vertical line denote significant differences using Student's _t_-statistic for differences among means (_df_ = 138, _p_ < .02).

The next series of student's _t_-tests for differences among means involved the rejected items. No significant between-group differences were found in either the honest or the fake-good conditions. For the fake-bad condition, subjects in the elevated groups rejected items significantly more slowly than subjects in the nonelevated group on scales *F*, *K*, *D*, *Pa*, and *Sc* (see Table 3).

Table 3

Mean Response Latency Z-scores for Rejected Items by Group and Condition

		Condition		
Dep. Var.	Group	Honest	F-G	F-B
L	Elevated	.05	.45	.40
	Nonelevated	-.04	.23	-.11
F	Elevated	.08	.11	.45[1]
	Nonelevated	-.15	-.21	-.01[2]
K	Elevated	.06	.22	.08[1]
	Nonelevated	-.02	-.16	-.37[2]
Hs	Elevated	.13	.00	.23
	Nonelevated	-.13	-.32	-.10
D	Elevated	.12	.00	.19[1]
	Nonelevated	-.12	-.27	-.28[2]
Hy	Elevated	.08	.03	.18
	Nonelevated	-.11	-.29	-.17
Pd	Elevated	.04	.01	.15
	Nonelevated	-.07	-.16	.00
Mf	Elevated	.03	.20	.29
	Nonelevated	-.04	-.19	-.14
Pa	Elevated	.08	.09	.19[1]
	Nonelevated	-.11	-.18	-.30[2]
Pt	Elevated	.08	-.02	.05
	Nonelevated	-.13	-.34	.08

Table 3 /contd.

Dep. Var.	Group	Condition: Honest	F-G	F-B
Sc	Elevated	.10	-.03	.33[1]
	Nonelevated	-.15	-.30	-.20[2]
Ma	Elevated	.09	-.01	.09
	Nonelevated	-.08	-.29	-.18
Si	Elevated	.06	.06	.11
	Nonelevated	-.09	-.25	-.21

Note. Different numbers on the same vertical line denote significant differences using Student's *t*-statistic for differences among means ($df = 138$, $p < .02$).

For total latencies, two-tailed *t*-tests revealed no significant between-group differences in either the honest or the fake-good conditions. When subjects were instructed to fake-bad, subjects in the elevated group responded slower than subjects in the nonelevated group to items on scales *F*, *K*, and *Hs* (see Table 4).

In order to test the importance of face validity of items in response latency research, the MMPI-2 subtle and obvious subscale latency scores were included as part of the main analyses (hypotheses a, b, and c). Six additional MANOVA's were performed using the Wilk's Lambda criterion. The dependent variables were subtle and obvious subscales'

Table 4

Mean Response Latency Z-scores for Total Items by Group and Condition

Dep. Var.	Group	Condition: Honest	F-G	F-B
L	Elevated	.03	.38	.44
	Nonelevated	-.03	.05	.02
F	Elevated	.10	.14	.36[1]
	Nonelevated	-.12	-.21	-.13[2]
K	Elevated	.06	.08	.09[1]
	Nonelevated	-.07	-.25	-.33[2]
Hs	Elevated	.12	.00	.25[1]
	Nonelevated	-.12	-.35	-.19[2]
D	Elevated	.10	.05	.18
	Nonelevated	-.11	-.28	-.23
Hy	Elevated	.08	.05	.19
	Nonelevated	-.09	-.28	-.20
Pd	Elevated	.04	.07	.05
	Nonelevated	-.05	-.11	-.15
Mf	Elevated	.05	.19	.28
	Nonelevated	-.05	-.22	-.16
Pa	Elevated	.09	.12	.11
	Nonelevated	-.09	-.20	-.27
Pt	Elevated	.08	.00	.08
	Nonelevated	-.10	-.31	-.30
Sc	Elevated	.12	.00	.15
	Nonelevated	-.13	-.29	-.23
Ma	Elevated	.05	-.02	.05
	Nonelevated	-.07	-.25	-.31

Table 4 /contd.

Dep. Var.	Group	Condition Honest	F-G	F-B
Si	Elevated	.07	.10	.09
	Nonelevated	-.06	-.23	-.21

Note. Different numbers on the same vertical line denote significant differences using Student's t-statistic for differences among means (df = 138, $p < .02$).

accepted, rejected, and total latencies. For the obvious subscale, accepted latencies, the 2 (group) X 3 (instructional condition) design revealed a significant interaction effect, $F(10,176) = 2.06$, $p < .03$. Using the accepted latencies on the subtle subscales as the dependent measures, a significant main effect for condition, $F(10,176) = 2.20$, $p < .02$ was found. For the rejected latencies on the obvious subscales, no overall effects were detected. Using the rejected latencies on the subtle subscales, however, an overall condition effect was found, $F(10,176) = 2.06$, $p < .03$. An overall condition effect was also found for obvious subscale total latencies, $F(10,176) = 1.93$, $p < .04$. No significant, overall effects were found for subtle subscale total latencies.

To test for hypothesized between-group differences, Student's t-tests using the .02 level (.05/3) of significance were performed. When accepting items in the honest condition, no significant differences were found between subjects in the elevated versus those in the nonelevated groups on either subtle (two-tailed) or obvious (one-tailed) subscales. Means are reported in Appendix A.

Elevated subjects were slower to accept psychopathology-related items when faking good than nonelevated subjects on the D and Pa obvious subscales. Mean z-scores for the elevated and the non-elevated groups on the D scale were .20 and -.36, respectively. On the Pa scale, the mean z-scores were .38 for the elevated group and -.26 for the non-elevated group. No other significant differences were found for subtle or obvious scale accepted items.

For subscale rejected latencies in the fake-bad condition, subjects in the elevated group (mean z-score = .39) responded more slowly than subjects in the nonelevated group (mean z-score = -.13) on the D obvious subscale. For further perusal of these means, see Appendix B. No other significant differences were found for subtle or obvious scale rejected items. For total subscale latencies, only the fake-bad condition revealed significant group differences. Subjects in the elevated group responded more slowly than subjects in the nonelevated group to items on the D and Hy obvious subscales. For the D subscale, mean z-scores were .19 and -.21 for elevated and non-elevated groups, respectively. For the Hy subscale, mean z-scores were .26 and -.19 for the elevated and non-elevated groups, respectively. vMean z-scores are also presented in Appendix C.

The third major hypothesis (hypothesis c) in this study sought to explore the response latency differences between scales that were elevated and those that were not for the elevated group. The expectations were that, when responding honestly, subjects in the elevated group would accept items more quickly and reject items more slowly on those MMPI-2 scales which are elevated compared to those scales which are not. Student's t-tests were performed to test for differences among the means (i.e., elevated scale latencies versus nonelevated scale latencies). Latencies for clinical scales 1-4 and 6-9, subtle subscales, and obvious subscales were analyzed separately. Latency analyses were performed for accepted and rejected items (one-tailed for clinical scales and obvious subscales, two-tailed for subtle subscales and total items. Of the nine t-tests performed, none was significant (see Table 5).

Analyses of responses to accepted versus rejected items were performed to determine whether each group followed the expected pattern of endorsement. Due to their psychopathology self-schema, the elevated group was expected (hypothesis a) to endorse psychopathology-related items more quickly, and reject psychopathology- related items more slowly as compared to normals. Endorsement pattern differences in the faking conditions were also of experimental interest (hypothesis b). The independent

Table 5

Mean Z-Scores for Scales by Elevations in the Elevated Group

		Endorsement		
Group	Scales	Accepted	Rejected	Total
Elevated	Clinical Scales	.07	.08	.05
Nonelevated		.12	.09	.09
Elevated	Obvious Scales	.10	.16	.11
Nonelevated		.16	.10	.11
Elevated	Subtle Scales	-.10	.11	-.04
Nonelevated		.07	.05	.04

Note. *N* and *df* varied for each analyses (*n* varied from 11 to 24).

variables were group (i.e., elevated and nonelevated), and condition (honest, fake-good, and fake-bad). Student's *t*-tests, all two-tailed due to nondirectional and/or nonspecific hypotheses, were performed to test for latency difference between accepted and rejected items on each basic scale (dependent variables). Significance levels were set at .01. Because only two types of latencies, accepted and rejected, were included in this comparison, .01 was decided upon as a more conservative alternative to .05. No significant differences were found between accepted and rejected basic scale latencies for the elevated group in the honest condition. For the nonelevated group in the honest condition, significant differences were found between basic scale accepted and rejected latencies on scales F and Sc. Subjects accepted psychopathology-related items more slowly than the items they rejected on both of these scales (see Table 6).

Table 6

Mean Basic Scale Z-scores by Endorsement in the Honest Condition

		Endorsement		
Group	Scale	Accepted	Rejected	Difference
Elevated	L	.13	.05	.08
	F	.34	.08	.25
	K	.08	.06	.01
	Hs	.16	.13	.03
	D	.11	.12	.00
	Hy	.11	.08	.03
	Pd	.05	.04	.01

Table 6 /contd.

Group	Scale	Endorsement Accepted	Endorsement Rejected	Endorsement Difference
	Mf	.08	.03	.05
	Pa	.11	.08	.03
	Pt	.13	.08	.05
	Sc	.18	.10	.08
	Ma	.05	.09	-.05
	Si	.10	.06	.04
Nonelevated	L	.25	-.04	.30
	F	.29	-.15	.43*
	K	-.10	-.02	-.08
	Hs	.00	-.13	.13
	D	-.10	-.12	.03
	Hy	-.03	-.11	.08
	Pd	-.03	-.07	.04
	Mf	-.02	-.04	.02
	Pa	.02	-.11	.13
	Pt	-.06	-.13	.07
	Sc	.10	-.15	.25*
	Ma	-.07	-.08	.01
	Si	-.03	-.09	.06*

*$p < .01$, $df = 92$

In the fake-good condition, subjects with elevations accepted *Pt* scale items significantly more slowly than those items they rejected. For subjects in the nonelevated group, a similar pattern was found between accepted and rejected items on scales *Pd*, *Pt*, and *Ma* (i.e., items were significantly more slowly accepted than rejected; see Table 7).

Table 7

Mean Basic Scale Z-scores by Endorsement in the Fake-Good Condition

		Endorsement		
Group	Scale	Accepted	Rejected	Difference
Elevated	*L*	.16	.45	-.29
	F	.61	.11	.50
	K	.02	.22	-.20
	Hs	.02	.00	-.01
	D	.15	.00	.15
	Hy	.12	.03	.08
	Pd	.25	.01	.23
	Mf	.14	.20	-.06
	Pa	.18	.09	.08
	Pt	.24	-.02	.26*
	Sc	.18	-.03	.20

Table 7 /contd.

Group	Scale	Endorsement Accepted	Rejected	Difference
	Ma	-.02	-.01	-.01
	Si	.18	.06	.12
Nonelevated	*L*	-.04	.23	-.27
	F	.07	-.21	.28
	K	-.29	-.16	-.13
	Hs	-.26	-.32	.05
	D	-.31	-.27	-.04
	Hy	-.23	-.29	.07
	Pd	.01	-.16	.17
	Mf	-.22	-.19	-.03
	Pa	-.27	-.18	-.09
	Pt	.06	-.34	.40*
	Sc	-.16	-.30	.14
	Ma	-.16	-.29	.13*
	Si	-.17	-.25	.08*

$p < .01$, $df = 92$.

No significant differences were found between accepted and rejected items for the elevated group in the fake-bad condition. Subjects in the nonelevated group rejected items more quickly and accepted items more slowly when faking bad on basic MMPI-2 scale L. The opposite endorsement pattern was found for scales Pd, Pt, and Ma (i.e., subjects were quicker to accept and slower to reject psychopathology-related items when faking bad; see Table 8).

Table 8

Mean Basic Scale Z-scores by Endorsement in the Fake-Bad Condition

		Endorsement		
Group	Scale	Accepted	Rejected	Difference
Elevated	L	.78	.40	.38
	F	.39	.45	-.06
	K	.08	.08	-.01
	Hs	.32	.23	.08
	D	.16	.19	-.03
	Hy	.20	.18	.02
	Pd	.00	.15	-.15
	Mf	.28	.29	-.01
	Pa	.08	.19	-.11
	Pt	.08	.05	.02
	Sc	.13	.33	-.20
	Ma	.05	.09	-.04
	Si	.11	.11	.00

Table 8 /contd.

Group	Scale	Endorsement Accepted	Rejected	Difference
Nonelevated	L	.78	-.11	.89*
	F	-.15	-.01	-.14
	K	-.18	-.37	.19
	Hs	-.19	-.10	-.08
	D	-.19	-.28	.09
	Hy	-.20	-.17	-.03
	Pd	-.18	.00	-.18*
	Mf	-.19	-.14	-.05
	Pa	-.26	-.30	.03
	Pt	-.34	.08	-.42*
	Sc	-.25	-.20	-.06
	Ma	-.37	-.18	-.20*
	Si	-.20	-.21	.00*

$p < .01$, $df = 92$.

This final section of results will address within-group differences. Post-hoc tests were only performed if the overall MANOVA and the subsequent univariate analysis suggested a condition effect or a condition by group interaction. When condition effects only were present, group means (i.e., elevated and nonelevated) were combined and analyzed. Pairwise comparisons using the Neuman-Keuls' procedure then compared mean differences among the three conditions (i.e., honest, fake-good, and fake-bad). As reported previously, overall condition effects were found only for basic scale accepted, rejected and total latencies, for obvious subscale total latencies, and for subtle subscale accepted and rejected latencies. Univariate tests revealed significant condition effects for all the scales in question. Neuman-Keuls' tests revealed significant results for accepted latencies on 1) the L scale (subjects accepted items more slowly when faking bad, mean z-score = .78, than when responding either honestly, mean z-score = .19, or faking good, mean z-score = .06), 2) the Pd scale (subjects accepted items more quickly when faking bad, mean z-score = -.09, than when faking good, mean z-score = .13), 3) the Pt scale (subjects accepted items more quickly when faking bad, mean z-score = -.13, than when faking good, mean z-score = .15), and 4) the Pa subtle subscale (subjects accepted items more quickly when faking bad, mean z-score = -.30, than when either faking good, mean z-score = -.06, or responding honestly, mean z-score = .04). The following significant differences were found for the rejected latency within-group tests: 1) subjects rejected items more slowly on the F scale when faking bad, mean z-score = .22, than when faking good, mean z-score = -.05, or when taking the test honestly, mean z-score = -.03, and 2) subjects rejected items more slowly when faking bad, mean *z*-score = .08, than when faking good, mean *z*-score = -.07, on the *Pd* scale (*df* = 92 for all the tests discussed above).

One group by condition interaction was found during the overall latency analysis; obvious subscale accepted latencies revealed a significant interaction effect. Thus, condition effects were separately analyzed for each group. None of the univariate tests was significant for the elevated group. For the nonelevated group, subsequent to running the univariate tests, post-hoc pairwise comparisons revealed that subjects accepted items more slowly when responding honestly, mean *z*-score = .23, than when faking good, mean *z*-score = -.26, or when faking bad, mean *z*-score = -.19, on the *Pa* obvious subscale (*df* = 92).

CHAPTER V

DISCUSSION

Discussion of T-score Findings

Before discussing the latency findings of this study, MMPI-2 basic *T*-score results will be briefly addressed. The first between-group effects that were expected were found (hypothesis 1); subjects in the elevated group produced higher *T*-scores than subjects in the nonelevated group on the MMPI-2 *F* scale, and clinical scales 1-4 and 6-9. Even though no group differences were found between the elevated and nonelevated groups in the fake-good condition, the groups differed on scales *Pa* and *Si* when faking bad (i.e., nonelevated subjects scored higher on both scales). Thus, hypothesis 2 was only partially supported. These weaker between-group results for the faking conditions are not surprising in that so few studies have been conducted comparing the *T*-scores of subjects with scale elevations and subjects with no scale elevations under faking instructions. Thus, it appears that both groups produce similar *T*-scores when faking, at least when faking good.

In regard to condition effects (hypothesis 3), the following predictions were supported: subjects in both the elevated and the nonelevated groups produced higher *L*-scale scores when faking good as compared to their honest responding. Further, subjects in the elevated group behaved according to expectations and produced lower *T*-scores when faking good compared to their honest responding on the *F* scale, and clinical scales *D*, *Pd*, *Pt*, *Sc*, *Ma*. However, no hypothesized clinical scale differences were detected for the nonelevated group when comparing mean *T*-scores for the honest and the fake-good conditions. This lack of clinical scale condition effect when comparing honest responding to faking good for the nonelevated subjects is not surprising. Several researchers have discussed what is called the "floor-effect" that normals experience when they are instructed to fake good (Brunetti, 1994; Peterson et al., 1989). These researchers have found that honestly responding college students endorse so few psychopathology-related items that, when asked to fake good, these profiles are very similar to their honest profiles.

When faking bad, both elevated and nonelevated subjects, as hypothesized, produced higher *T*-scores as compared to their honest responding on the *F* scale, clinical scales 1-4, and 6-9.

Overall, the three instructional sets presented to subjects each appeared effective. Subjects in both the elevated and the nonelevated groups behaved according to expectations when responding honestly, when faking good, and when faking bad.

Discussion of Response Latency Findings

Results of the response latency analyses of this study showed that subjects with elevated MMPI - 2 profiles do not respond differently than subjects with normal profiles when responding honestly. Accepted, rejected, or total latency differences were not found between the elevated and the nonelevated groups on any of the MMPI-2 basic or subtle/obvious scales when the test was taken honestly. Thus, it appears that subjects in the elevated versus the nonelevated groups do not statistically differ from each other in terms of reaction times when taking the MMPI - 2 with standard instructions.

Results further revealed that, as hypothesized, subjects with elevated MMPI - 2 profiles respond differently than subjects with normal profiles when instructed to fake. Response latency differences between the groups were found for the faking conditions. For basic scale accepted latencies, one fake-good difference was found (i.e., on scale D). For basic scale rejected latencies, five fake-bad differences were found (i.e., on scales F, K, D, Pa, and Sc). For basic scale total latencies, three fake-bad differences were found (i.e., on scale F, K, and Hs). Subjects in the elevated group responded more slowly than subjects in the nonelevated group to items on all the scales where significant differences were found, regardless of whether they were accepting or rejecting items. Actually, this tendency to respond slower was apparent for almost all scales in all conditions (including the honest condition). However, significance levels were only reached in the instances mentioned above. Keeping the discussion to significant results only, it appears that a psychopathology self-schema slows down the process of responding when adopting a faking schema. Because most of the between-group differences were found in the fake-bad condition, this slowing process appears particularly true when elevated subjects adopt a faking psychopathology schema in which they must exaggerate their problems.

The elevated subjects' pattern of responding more slowly to all items regardless of whether items are rejected or accepted is in direct contradiction to recent theoretical postulates and empirical evidence (e.g., Holden et al., 1992; Brunetti, 1994). These researchers found that when subjects are instructed to fake, they adopt a faking schema that is similar to a self-schema. In terms of response latencies, subjects proceed to endorse schema-relevant items more quickly and reject schema-relevant items more slowly both when faking and when responding honestly (i.e., subjects make a shift in schema when faking but the endorsement process remains the same). However, none of the previous empirical studies on inventory response latencies included clinical populations. Thus, current findings indicate that individuals with some psychopathology may behave more according to the theory of Rogers (1977), who maintains that accessing a schema prolongs the process of responding.

Further evidence that subjects with scale elevations do not follow the same endorsement pattern as normals comes from the analysis for the elevated subjects in the honest condition (hypothesis a). The expectation was that subjects preselected for psychopathology were to accept psychopathology-related items more quickly, and reject psychopathology-related items more slowly on scales that were elevated versus those that were not (Holden et al., 1992). Thus, an important part of the main analysis of this study compared latencies for elevated scales to those with no elevations (accepted, rejected, and total latencies were compared separately). No significant differences were revealed, suggesting latencies for elevated and nonelevated scales were essentially the same. Elevated subjects thus appear to respond with comparable speed to all inventory items when taking the test honestly.

In order to obtain information about possible pattern differences between the elevated and nonelevated groups, basic scale accepted and rejected latencies were compared for each group. Only one significant difference was found for the elevated group (i.e., for the Pt scale in the fake-good condition). Again, this suggests that subjects in the elevated group respond with similar speed to accepted as well as rejected items. However, several significant differences were found for the nonelevated group (i.e., for the _F_ and _Sc_ scales in the honest condition, for the _Pd_, _Pt_, and _Ma_ scales in the fake-good condition, and for the _L_, _Pd_, _Pt_, and _Ma_ scales in the fake-bad conditions). All significant differences followed the expected endorsement pattern found in previous response latency research (e.g., Holden & Popham, 1990; Holden et al., 1992; Brunetti, 1994). In the honest condition, accepting items on the _F_ and _Sc_ scales took significantly longer than rejecting items. In the fake-good condition, accepting items on the _Pd_, _Pt_, and _Ma_ scales also took significantly longer than rejecting items. In the fake-bad condition, accepting items took significantly longer on the _L_ scale, but significantly shorter on the _Pd_, _Pt_, and _Ma_ scales as compared to the rejected items. Thus, it appears that even though normals endorse items according to previously established expectations, both in honest and faking conditions, subjects with elevations do not respond according to this pattern.

Turning to address the issue of face-validity of items when doing response latency research, current results revealed that the full scales, with both subtle and obvious items, are as good at predicting scale differences as either the obvious subscales or the subtle subscales. The subtle/obvious subscale response latency between-group analysis yielded five significant findings for the obvious subscales in the fake-good and the fake-bad conditions as compared to nine significant findings for the full scales.

Finally, the within-group differences found in this study were for the most part consistent with previous response latency findings (e.g., Holden & Popham, 1990; Holden et al., 1992; Brunetti, 1994) in terms of expected speed of endorsement. For example, subjects accepted L scale items more slowly when faking bad than when responding honestly or faking good. However, the sheer number of findings were few. The reason for this lack of significant results is uncertain. It is possible that results were influenced by having combined the elevated and nonelevated groups before analyzing the condition effects.

Conclusions

In conclusion, subjects with scale elevations appear to approach inventory item responding differently than normals in terms of their response latencies. At least when faking bad, they respond more slowly than normals regardless of whether they accept or reject items. Their process of responding does not appear to be affected by scale elevations, whether they decide to accept or reject an item, or whether the item is scored for psychopathology. For example, elevated subjects rejected K scale as well as Sc scale items more slowly than nonelevated subjects when faking bad. Thus, after adjusting for item length, all items are answered with comparable speed. The subtlety of an item does not seem to interfere with this process, either. The response process of elevated subjects thus appear consistent with Rogers' (1977) hypothesis stating that performing self-referenced tasks slows down the process of responding (schemas are elaborate and involve deeper processing).

The normal subjects in this study responded according to previously established latency expectations. They accepted items more quickly and rejected items more slowly on psychopathology- related scales when faking bad, with the opposite pattern found when faking good or responding honestly. Thus, the response process of nonelevated subjects appear consistent with Holden et al.'s (1992) position that individuals follow the pattern described above when accessing a self-schema or adopting a faking schema, depending on the instructions.

Why individuals with elevations differ from normals in terms of the response latency process they utilize is at this point uncertain and purely speculative. Perhaps variables related to experiencing psychological difficulties (e.g., psychomotor retardation due to depression, anxiety, thought disturbances, etc.) slows down the process of responding. However, this does not explain why the pattern is different, only why latencies are slower. Further, responding was primarily found to be slower in the fake-bad condition. Perhaps being told to fake-bad triggers thoughts or feeling of their own difficulties, and they start to access their psychopathology self-schema. Attempting to differentiate between the self and the adopted identity may require some additional efforts forcing expenditure of time. Turning to the apparent between-group process differences, the answers may be found by exploring what constitutes a self-schema and what does not. The self-schema may need to be something one identifies with strongly in order to have what Rogers (1977) called an elaborate framework. Individuals may utilize one pattern when a schema is sketchy and switch to a different pattern when a schema is more elaborate.

When comparing latency differences to T-score differences, results from this study presented an interesting picture. When responding honestly, T-scores predicted group membership quite successfully, whereas no between-group response latency differences were detected. However, for the fake-bad condition, response latencies appeared a better predictor of group membership than T-scores. For future reference, one may thus be able to distinguish between a mentally healthy person who is faking bad and a disturbed person who is faking bad by looking at the speed and pattern of responding. Even more salient, one may also be able to distinguish between a severely disturbed person who is responding honestly and a disturbed person who is faking bad. This would be important information, particularly for clinicians working in settings were over-reporting is a common phenomena. In certain setting, for example, in VA populations, one can often observe a "ceiling effect" when administering the MMPI-2 (i.e., an

MMPI-2 profile where most of the psychopathology scales, including the F scale, are in the elevated ranges). In these settings, response latencies may eventually aid in the process of distinguishing over-reporters from acutely disturbed individuals.

Recommendations for Future Research

There are certain limitations to this study that could be improved in future research. First, a true clinical population was not utilized. Instead, college students were screened for psychopathology and then included as subjects in the elevated group only if their MMPI-2 scores were in the elevated ranges on any of the 8 clinical scales. The differences between college students with elevations versus those with no elevations are probably less than the differences found between normal and mental health populations. Further, the T-score differences between some of the subjects categorized as elevated and their nonelevated counterparts were only a point or two. A subject with a scaled T-score of 64 would be classified as nonelevated while another subject with a scaled T-score of 65 would be classified as elevated. Thus, the two groups may be more homogenous on a mental health-illness dimension than preferred. In future studies, the utilization of true clinical populations, or extreme groups, should assure more between-group variability.

Another limitation to this study pertains to the possible confounding factor of fatigue for all participants. Even though the order of presentation was rigidly controlled, subjects were still required to take the MMPI-2 three times. Further, the absolute latencies in this study are only generalizable to other college populations who have taken the MMPI-2 three times in a row. In future studies, MMPI-2 administrations should be limited to no more than two, and ideally just one per subject.

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APPENDIXES

APPENDIX A

MEAN SUBTLE/OBVIOUS RESPONSE LATENCY Z-SCORES FOR ACCEPTED ITEMS BY GROUP AND CONDITION

Appendix A

Mean Subtle/Obvious Response Latency Z-scores for Accepted Items by Group and Condition

		Condition		
Dep. Var.	Group	Honest	F-G	F-B
D-Obvious	Elevated	.23	.20[1]	.15
	Nonelevated	.01	-.36[2]	-.21
Hy-Obvious	Elevated	.20	.45	.28
	Nonelevated	.10	.03	-.22
Pd-Obvious	Elevated	.09	.45	.05
	Nonelevated	.00	-.04	-.23
Pa-Obvious	Elevated	.02	.38[1]	.19
	Nonelevated	.23	-.26[2]	-.19
Ma-Obvious	Elevated	.10	-.06	.08
	Nonelevated	-.08	-.12	-.35
D-Subtle	Elevated	.10	.15	.15
	Nonelevated	-.12	-.32	-.06
Hy-Subtle	Elevated .	.06	.03	.14
	Nonelevated	-.05	-.22	-.15
Pd-Subtle	Elevated	.00	.12	.08
	Nonelevated	-.03	-.18	-.33
Pa-Subtle	Elevated	.13	.15	-.17
	Nonelevated	-.06	-.27	-.43
Ma-Subtle	Elevated	.00	.02	.02
	Nonelevated	-.06	-.18	-.39

Note. Different numbers on the same vertical line denote significant differences using Student's *t*-statistic for differences among means ($df = 138$, $p < .02$).

APPENDIX B

MEAN SUBTLE/OBVIOUS RESPONSE LATENCY Z-SCORES FOR REJECTED ITEMS BY GROUP AND CONDITION

Appendix B

Mean Subtle/Obvious Response Latency Z-scores for Rejected Items by Group and Condition

		Condition		
Dep. Var.	Group	Honest	F-G	F-B
D-Obvious	Elevated	.12	-.06	.39[1]
	Nonelevated	-.15	-.26	-.13[2]
Hy-Obvious	Elevated	.10	.00	.29
	Nonelevated	-.13	-.33	.05
Pd-Obvious	Elevated	.03	.00	.42
	Nonelevated	-.08	-.30	.00
Pa-Obvious	Elevated	.13	.14	.17
	Nonelevated	-.15	-.13	-.03
Ma-Obvious	Elevated	.14	.03	.02
	Nonelevated	-.10	-.33	.01
D-Subtle	Elevated	.13	.30	.10
	Nonelevated	-.01	-.20	-.37
Hy-Subtle	Elevated	.04	.11	.13
	Nonelevated	-.02	-.20	-.23
Pd-Subtle	Elevated	.07	.09	.16
	Nonelevated	-.12	-.15	-.14
Pa-Subtle	Elevated	.03	.02	.05
	Nonelevated	-.08	-.29	-.35
Ma-Subtle	Elevated	.10	-.08	.13
	Nonelevated	-.04	-.24	-.25

Note. Different numbers on the same vertical line denote significant differences using Student's *t*-statistic for differences among means ($df = 138$, $p < .02$).

APPENDIX C

MEAN SUBTLE/OBVIOUS RESPONSE LATENCY Z-SCORES FOR TOTAL ITEMS BY GROUP AND CONDITION

Appendix C

Mean Subtle/Obvious Response Latency Z-scores for Total Items by Group and Condition

		Condition		
Dep. Var.	Group	Honest	F-G	F-B
D-Obvious	Elevated	.12	-.03	.19[1]
	Nonelevated	-.13	-.26	-.21[2]
Hy-Obvious	Elevated	.10	.02	.26[1]
	Nonelevated	-.11	-.31	-.19[2]
Pd-Obvious	Elevated	.05	.05	.15
	Nonelevated	-.08	-.28	-.22
Pa-Obvious	Elevated	.10	.18	.22
	Nonelevated	-.11	-.14	-.18
Ma-Obvious	Elevated	.09	-.01	.04
	Nonelevated	-.10	-.29	-.30
D-Subtle	Elevated	.06	.18	.15
	Nonelevated	-.06	-.28	-.31
Hy-Subtle	Elevated	.03	.08	.11
	Nonelevated	-.05	-.22	-.20
Pd-Subtle	Elevated	.04	.12	.13
	Nonelevated	-.06	-.16	-.24
Pa-Subtle	Elevated	.06	.05	-.02
	Nonelevated	-.07	-.28	-.38
Ma-Subtle	Elevated	.03	-.03	.08
	Nonelevated	-.05	-.20	-.32

Note. Different numbers on the same vertical line denote significant differences using Student's *t*-statistic for differences among means ($df = 138$, $p < .02$).

APPENDIX D

INFORMED CONSENT STATEMENT

INFORMED CONSENT STATEMENT

Project Title: *Schema theory and faking on the Minnesota Multiphasic Personality Inventory-2*

Experimenters: Anne B. Scott, M. S. & Robert S. Schlottmann, Ph.D.

I, (print name)________________________________ hereby authorize and direct Anne B. Scott, M.S., and Robert S. Schlottmann, Ph.D., or assistants of their choosing, to perform the procedures listed here.

A. Purpose: This study is designed to investigate different styles of responding on the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). The MMPI-2 is a widely used, standardized personality test. The format of the MMPI-2 consists of several hundred true/false items, some of which may be personal in nature.

B. Procedures: You will be asked to do the following:

1. Read a set of instructions on using the computer and responding to the MMPI-2.
2. Answer items on a short form of the MMPI-2 twice.
3. Participate in a debriefing session at the end of the experiment. Your questions will be addressed at this time. Please note that no information gained from the MMPI-2 will be made available to you.

C. Duration of Participation: Your participation will take from 2-3 hours.

D. Confidentiality: Computer files of this experiment's data will be numerically coded. Your name will not be affixed to any of the MMPI-2 materials. Thus, your anonymity will be assured.

E. Risks: The risks in this study are minimal and do not exceed those ordinarily encountered in daily life. Some people may find specific items on the MMPI-2 personal and/or intrusive, but they are part of routine psychological evaluation and testing.

F. Benefits: Through your participation in this study you will be exposed to scientific psychological research. This may help you in understanding the procedures and methods of psychology. In addition, the results of this andsubsequent related studies may aid psychologists in understanding responses on the MMPI-2. You will also be awarded extra credit points for your participation.

G. Compensation: You will be awarded 1 extra credit point in your PSYCH 1113 (Introductory Psychology) class for each hour or fraction of an hour you choose to participate in this experiment (Max=2); there are other ways that you can get extra credit in your class. You can be involved in other experiments and/or complete projects (e.g., book reports) which your instructor will explain.

I have been fully informed about the procedures listed here.

I am aware of what I will be asked to do and of the risks and benefits in this study. I also understand the following statements:

I certify that I am at least 18 years of age.

My participation today is part of an investigation called *Schema Theory and Faking on the Minnesota Multiphasic Personality Inventory-2*.

The purpose of this study is to investigate different styles of responding on the MMPI-2.

I understand that my participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation at any time without penalty.

I understand that the research is being conducted by Anne B. Scott, M.S., under the supervision of Robert S. Schlottmann, Ph.D., in association with the Oklahoma State University Department of Psychology.

I understand that I may contact either Anne B. Scott, M.S., at 405/744-6027, Robert S. Schlottmann, Ph.D., at 405/744-6567, or Ms. Jennifer Moore at the Oklahoma State University Research Services, 005 Life Sciences East, Stillwater, OK 74078; 405/744-5700 if I wish further information regarding this research.

I have read and fully understand the information contained in this form as presented to me. I sign it freely and voluntarily.

______________________ ________

Signature of Subject Date

I certify that I have personally explained all areas of this form prior to the subject signing it.

______________________ ________

Signature of Researcher Date

APPENDIX E

INSTITUTIONAL REVIEW BOARD

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 10-05-94 **IRB#:** AS-95-013

Proposal Title: SCHEMA THEORY, RESPONSE LATENCY DIFFERENCES, AND FAKING ON THE MMPI-2

Principal Investigator(s): Robert S. Schlottmann, Anne B. Scott

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Revisions received and approved.

Signature: ______________________ Date: November 7, 1994
Chair of Institutional Review Board

2

VITA

Anne Britt Scott

Candidate for the Degree of

Doctor of Philosophy

Dissertation: RESPONSE LATENCIES AND FAKING ON THE MMPI-2: IMPLICATIONS FOR ELEVATED VERSUS NONELEVATED PROFILES

Major Field: Psychology

Bibliography:

Personal Data: Born in Solleftea, Sweden, December 2, 1965, the daughter of Ivar and Margit Rossavik.

Education: Graduated from Persbraten High School, Oslo, Norway, in 1985; received the Bachelor of Arts degree in Psychology from the University of Oklahoma, Norman, Oklahoma, in 1990; received the Master of Science degree in Psychology at Oklahoma State University in July, 1992; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in December, 1996.

Professional Experience: St. Luke's Hospital, St. Louis, Missouri, July 1996 to present; Veterans Administration Medical Center, St. Louis, Missouri, September 1995 to August 1996; Veterans Administration Medical Center, Oklahoma City, Oklahoma, September 1994 to May 1995; Psychological Services Center, Oklahoma State University, Stillwater, Oklahoma, August 1992 to June 1994.

Professional Memberships: American Psychological Association (Student Affiliate); Society of Personality Assessment (Student Affiliate); Southwestern Psychological Association (Student Affiliate).