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Physiological Response Associated With Select Rorschach Codes

Chad Ryan Sims
University of Tennessee, Knoxville

To the Graduate Council:

I am submitting herewith a thesis written by Chad Ryan Sims entitled "Physiological Response Associated With Select Rorschach Codes." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Leonard Handler, Major Professor

We have read this thesis and recommend its acceptance:

Derek Hopko, Lance Laurence

Accepted for the Council:
Dixie L. Thompson

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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PHYSIOLOGICAL RESPONSE ASSOCIATED WITH SELECT RORSCHACH CODES

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Chad Ryan Sims

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DEDICATION

This thesis is dedicated to my wife, April Sims, whose unwavering support made this milestone achievable. She continues to be my source of inspiration, and her belief in my ability to succeed made all the difference.

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ABSTRACT

The purpose of this study was to investigate the validity of Rorschach codes that have been theoretically and empirically linked to the experience of affect in the Comprehensive System (Exner, 2003) through the use of skin conductance and heart rate data. Twenty-four university undergraduates (18 females and 6 males) were administered the Rorschach while physiological data were recorded in an adjacent room. It was anticipated that responses yielding particular codes (*C*, *C'*, *m*, *T*, *V*, *Y*, minus form quality, or cognitive special scores) would evidence higher levels of affective arousal as compared to all other responses. Several within-subjects analyses failed to support this hypothesis. It was concluded that these codes might not be as useful as previously described in indicating the presence of affect, particularly from the standpoint of sequence analysis strategies.

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CHAPTER I

INTRODUCTION

Review of the Literature

With the development of Exner's Comprehensive System, a renewed interest in the use of the Rorschach as both a clinical and research instrument took hold (Anastasi & Urbina, 1997; Exner, 2003). Recent reviews in the literature demonstrate the widespread use of the Rorschach as an assessment tool, and the associated clinical and research interest that it generates. Viglione and Hilsenroth (2001) found it to be the second most frequently researched assessment instrument, and they cite evidence that 90% of a sample of clinical practitioners promote the notion that clinical psychology students should be competent in its use. Mihura and Weinle (2002), based on the results of a survey of 254 American Psychological Association graduate student affiliates, discovered that nearly 60% of students feel that they are likely to use the Rorschach in practice, while 13% claim that they are likely to use it in research. Of the students surveyed, 87% were offered an assessment course in their graduate program that included training in the use of the Rorschach, and 95% reported that Exner's Comprehensive System was the method of administration and scoring taught in their introductory course. Internship sites tend to provide further evidence of the importance of the Rorschach in contemporary clinical training; Clemence and Handler (2001), in their survey of 382 professional psychology internship settings across the United States and Canada, found that 69% of internship sites consider Rorschach administration a desirable skill. In light of these recent findings,

continued attempts to examine the reliability and validity of the Rorschach are of great importance.

Over the last few decades, some of the codes and indices crucial to Rorschach interpretation in the Comprehensive System have amassed evidence of their validity. Others, however, remain to be studied in more detail, and with varying populations. One interesting manner in which researchers have attempted to understand the implications of specific codes and test characteristics is through the use of psychophysiological methods. In particular, electrodermal response data have been used, typically as an indication of emotional response, to develop a greater understanding of Rorschach characteristics, though prior to the development of the now widely used Comprehensive System. Levy (1950) examined the differential pull of Rorschach cards, failing to support a hypothesis that the colored and heavily shaded cards would generate a greater skin conductance response (SCR) in examinees. Forrest and Dimond (1967), using pre-Comprehensive System determinant categories, found a significant increase in galvanic skin response (GSR) associated with the use of human figure, dehumanized figure, and humanized animal content, white space, inanimate movement (*m*), shading used to give a third dimension (*FK*), and shading used as surface texture (*cF*). These researchers anticipated a significant GSR increase associated with the use of shading used as diffusion (*KF*), but felt they were unable to obtain enough responses in this category to find the expected significance. Brodsky, Brewer, Vrana, and Wergin (1969), in examining the association between Rorschach response content and GSR, discovered higher levels of arousal for Human, Monster, and a combined Biology-Anatomy-Sex category of content across groups of non-patients, patients classified as neurotic, and patients diagnosed as

schizophrenic. Broekmann (1970) presented data demonstrating that individuals with a high *SumC* tend to have a strong cardiovascular reaction to color stimuli in the Rorschach, while those with a high F quotient tend to have strong GSRs when giving form responses. Vine (1970), in a study similar to the present one, examined the relationship between certain scoring categories in a combined Beck-Klopfer scoring system and measures of autonomic activity. He failed to find a significant difference in GSR, EMG, and heart rate levels between a category of responses that included color and shading determinants (color, vista, shading, and texture), and all other responses. Dale (1985) provided evidence that skin conductance responses seen in the administration of the Rorschach are more related to the evocation of anxiety than to a simple orienting response. The purpose of the present study is to utilize such physiological data to test the validity of common scoring codes used in Exner's Comprehensive System. Such an analysis appears to have been neglected in the literature despite the widespread use of this scoring system.

The use of physiological data to measure the affective value of stimuli has been supported in the literature. Although some have challenged the use of measures such as skin conductance and heart rate on the grounds that these indices cannot discriminate between varying affect constructs, others have recognized that this does not refute the idea that such measures are related to the intensity of emotional thoughts or experiences in general (Andreassi, 2000; Blascovich, 2000; Pinel, 1990). The usefulness of physiological measures, however, certainly varies; for example, heart rate may not be as reliable an indicator of certain affective experiences, such as anxiety (Fowles, 1986, 2000). The validity and meaning of several determinants, a particular form quality, and a

set of special scores seen in Rorschach protocols scored using the Comprehensive System would seem to be testable through an analysis of physiological data. The codes of interest in this study include texture (*T*), vista (*V*), achromatic color (*C'*), diffuse shading (*Y*), chromatic color (*C*), inanimate movement (*m*), minus form quality, deviant verbalization (*DV*), deviant response (*DR*), incongruous combination (*INCOM*), fabulized combination (*FABCOM*), contamination (*CONTAM*), and inappropriate logic (*ALOG*). These codes in particular, based on theoretical views and empirical evidence, have been linked to affect.

Briefly, the Rorschach determinants included in this study indicate the following: texture responses are considered to reflect a need for emotional and/or physical closeness to others; diffuse shading is commonly thought of as an indication of helplessness, hopelessness, and withdrawal accompanied by anxiety; vista is thought to reflect a tendency to experience negative affect associated with self-examination; achromatic color is considered to indicate irritating, internalized affect; chromatic color is thought of as relating to emotional lability and responsivity; and inanimate movement is considered to reflect a sense of threat, worrisome thoughts, tension, and consequent helplessness (Exner, 2003; Lerner, 1998; Weiner, 2003). Minus form quality is assigned when a response "violates the properties of the stimulus field" (Exner, 2003, p. 378). Weiner (2003) has called this type of response a "failure in adaptive functioning" (p. 188), and discusses several sources of distress that may be implicated in this breakdown of functioning. The six special scores included in this study each reflect the presence of some measure of cognitive disruption. As Weiner (2003) has noted, these codes may be useful in a sequence analysis of a test-taker's protocol as an indication of poor response

quality, which reflects troubling concerns and associated anxiety. It would seem, at least on occasion, that each of these variables might reasonably be hypothesized to reflect fluctuations in affective arousal. What follows is a relatively brief review of the literature concerning the meaning of each of these codes, along with a discussion of relevant research.

Shading and Inanimate Movement:

As much of the research concerning the shading-related and inanimate movement determinants has been conducted together, research focusing on these determinants will be examined together in this section. Exner (2003) notes the commonalities between the texture, vista, achromatic color, and diffuse shading variables (historically grouped together with the symbol *Sh*, denoting the use of the shading aspect of the blot), namely that all of them relate to irritating or impinging emotional experiences, yet he is clear that there is an important difference as well. While the diffuse shading variable tends to reflect situational experiences and is quite unstable, the others are more stable and trait-like; however, Exner states that texture and vista may occasionally be reflective of phenomena that are more situational and state-like. As well, in discussing achromatic color responses, he states that, "like *FM* it seems to have some trait like stability, but is also influenced by state conditions" (p. 250). A brief explanation of the meaning of each of these determinants as set forth in Exner's Comprehensive System for the Rorschach will be presented followed by a closer examination of other studies relevant to the hypotheses of the present work.

In discussing the background of the diffuse shading and inanimate movement determinants, Exner (2003) notes that early systematizers of the Rorschach generally considered diffuse shading to have some relation to anxiety and possibly passivity, while inanimate movement was thought to reflect the experience of frustration. Exner also reviews more recent research that would seem to support the notion that diffuse shading and inanimate movement responses relate to situational stress, a sampling of which will be discussed here. Shalit (as cited in Exner, 2003), tested 20 Israeli seamen during a severe storm condition on a small ship, and then compared the number of inanimate movement responses to a prior testing of the same individuals from one year previously. Shalit discovered a significantly greater number of inanimate movement responses during the stressful storm condition, and attributed this difference to a feeling of disruption and loss of control during the storm. Exner also discusses the results of research by Armbruster, Miller, and Exner, who found increases in the number of inanimate movement and diffuse shading responses in the Rorschach protocols of Army paratroop trainees from their initial training period to the day or evening before their first jump. Three participants had *m* in their records at the original testing, while 12 produced at least one *m* response in the retest. Nine records included *Y* at initial testing, while 14 included *Y* at retest. Statistical significance was only reported for the increase in the number of inanimate movement responses however. Exner describes the results of his research, wherein he found that long-term psychodynamic therapy patients, 9 to 12 months into treatment, evidenced a mean increase in both *m* (from 1.74 to 2.93) and *Y* responses (from 1.08 to 2.37) relative to the time they began treatment. These increases were

mainly found in the Rorschach protocols of patients who were judged by their therapists to be experiencing distress at the time.

Exner (2003) reports research yielding negative findings concerning the hypothesized meaning of these determinants as well. He discusses an apparently common finding of no relationship between diffuse shading responses and scores on the Manifest Anxiety Scale. He also cites the work of Schwartz and Kates who, utilizing an experimentally induced stress paradigm, actually found fewer *Y* responses among their stressed group than their control group. In reviewing the limitations of such experimentally induced stress and frustration studies, Exner focuses on the fact that the participants may maintain a sense of control even while presented with an effectively distressing independent variable. He reports on studies utilizing natural stress situations, which he feels may have a more reliable outcome, such as that of Ridgeway and Exner who found substantial increases in *m* and *SumY* from the protocols of 16 medical students from the time they began their training to shortly after their first anatomy examination. As another example of an ostensibly uncontrollable natural stress study, Exner, Thomas, Cohen, Ridgeway and Cooper (as cited in Exner, 2003) found a significantly greater number of *m* and *Y* responses in a group of heart attack patients about to be discharged, while maintaining some risk for further medical problems, relative to a control group of orthopedic surgery patients who were about to be discharged without a significant risk to their future health or recovery.

In describing the early systematizers' beliefs about the meaning of achromatic color (*C'*) responses, Exner (2003) writes of its early use as an indicator of depressive affect and of the control over external expressions of affect. Similarly, in the

Comprehensive System, this determinant is considered to relate to the internalization of affect and an associated sense of irritation. The nature of this irritation, however, seems to vary as it can "probably take any of several forms, ranging from a vague uneasiness or discomfort to a much more marked experience of tension" (Exner, 2003, p. 255). Exner also provides a sampling of his own research that yields evidence for this interpretation of *C'*. One of his studies examined the presence of suicidal gestures within the first 55 days of treatment among 64 first admission patients with affect disorders. Among those who did make such gestures (n = 16), only 31% of their pretreatment Rorschach records contained *C'*, as compared to 71% of the records for those who did not make such gestures. This would seem to support the idea that this determinant reflects a constraint of affect. In other studies he has conducted, it was found that elevations in the total number of *C'* responses relate to the presence of strong disturbances in affect. One of these found that depressed inpatients tend to have less than half the number of *C'* responses at discharge relative to their pretreatment records. Schlesinger and Fox (1980) provide further evidence for this interpretation of *C'*. They administered the Rorschach to a total of 20 hospitalized patients, half having been diagnosed with unipolar depression, and the other half with diagnoses such as schizophrenia, personality disorders, and seizure disorders, all of which were determined to lack a significant depressive component. The depressed patients' protocols yielded significantly more achromatic color responses (mean of .85) compared to the control group (mean of .4). Interestingly, male patients with depression were the only participants who provided significantly more achromatic responses. Although the hypothesis was supported in this research, the gender differences are difficult to explain. A summary of research findings

concerning *C'* was provided by Frank (1993), who states that the research available at the time was too equivocal to allow for any certainty as to the validity of usual interpretations of *C'*. He discusses Exner's creation of the Depressive Index, a composite of protocol characteristics, as evidence that *C'* responses are not very useful in and of themselves in detecting depressive affect. As with some other determinants and scoring codes in the Rorschach, the evidence for the meaning of *C'* is therefore somewhat mixed.

In the Comprehensive System, vista responses are considered to reflect negative affect associated with a process of self-examination, an interpretation which shares similarities with the early consideration of this determinant in other Rorschach systems, which focused on its relationship to introspection, a sense of inferiority and depression, and attempts to handle anxiety. When it is found in a protocol, it is generally interpreted as evidencing the presence of some level of discomfort associated with negative rumination concerning the self (Exner, 2003). Exner (2003) reports the findings of several studies leading to the common contemporary interpretation of this determinant. For example, in one of Exner's earlier studies, more vista responses were found among individuals who later made some suicidal gesture within two months after testing. In another reported study, Exner found more vista responses among patients in group psychotherapy who provided more self-focused statements during sessions. Also, as mentioned previously, Exner discusses the idea that vista represents a trait like characteristic, but may be situationally responsive at times, such as when it appears as a reflection of remorse over some recent action. Additionally, he notes that several studies of this determinant led to its inclusion in the Suicide Constellation of the Comprehensive System. This index is scored as positive when at least 8 of its 12 conditions are present

in a protocol, one of which can involve the presence of more than two vista responses. Using this index, approximately 80% of patients who went on to commit suicide in a group of related studies were correctly identified.

Texture responses are considered to indicate a need for emotional and physical closeness to others in the Comprehensive System. One texture response in a protocol is considered normative, more than one is thought to indicate exacerbated needs to be close to others, while an absence of texture is considered to reflect concerns about maintaining interpersonal distance (Exner, 2003). Weiner (2003) states that "generally speaking, people who give *T* responses are likely not only to enjoy but to need, want, and reach out for physical and/or emotional closeness to others" (p. 173). Exner (2003) provides a sampling of research to support this interpretation of the texture determinant in the Comprehensive System. He cites the work of Exner and Bryant to illustrate the potential fluctuations that may occur with this determinant due to situationally determined affect. These researchers found that 30 recently divorced or separated individuals had an average of 3.57 texture responses in their protocol with none yielding an absence of *T* responses, as compared to a mean of 1.31 for a demographically matched control group among which four protocols had no *T* responses. At a six-month follow up, 14 participants in the former group had formed relationships and the mean number of *T* responses for this subgroup had changed from 3.49 initially to 2.64 at the second testing. Exner cites his own research, which focused on 33 therapists' ratings of 150 patients after the initial six to eight therapy sessions. A significant difference was found in the proportion of patients with no *T* responses in their protocols that were rated by therapists as being less motivated for treatment. Exner also discusses the work of Casella who collected

Rorschach data from 79 participants grouped by attachment status (i.e. secure, avoidant, and preoccupied). As would be expected, secure participants tended to have one *T* response, avoidant participants zero *T* responses, and preoccupied participants more than one *T* response. Further support for the interpretation of this determinant is found in the work of Blias, Hilsenroth, and Fowler (as cited in Exner, 2003) who discovered that texture responses were significantly correlated with a diagnosis of histrionic personality disorder as determined by the Diagnostic and Statistical Manual – IV.

Each of these determinants, then, would seem to be related to the experience of affect. In some instances, such as when *T* =1, the associated affect might be considered to reflect a normal, stable need for the experience of closeness, while in other instances, such as with the presence of *Y* or *m*, a dysphoric, relatively unstable feeling is thought to be implicated. Each, however, might reasonably be considered to be associated with some sort of emotional arousal. Aside from evidence for the common interpretations of these determinants provided by Exner in support of the Comprehensive System, other studies provide some support for the notion that these determinants are related to affect, although conflicting results are certainly not uncommon in the literature.

Allerhand (1954) utilized a procedure with 50 participants that involved a conflict and a non-conflict situation, both of which required the solution of multiple choice problems, in an effort to better understand the nature of shading responses on the Rorschach. The situations were the same except for the presence of an aversive noise and a painful shock delivered simultaneously along with pressure to solve the problems quickly for the conflict session. The sessions were presented at least three weeks apart. Behavioral manifestations of anxiety, such as perspiration and fidgeting, were found to be

significantly correlated with Rorschach shading responses in general from three different scoring systems (Beck, Klopfer, and Binder) for both sessions, and with texture responses in particular, when the shading category was broken down. Not only were texture responses capable of predicting overt manifestations of anxiety during the testing sessions, but also during the resting period after the conflict situation.

Auerbach and Spielberger (1972) analyzed Rorschach research in an effort to differentiate response characteristics that are associated with trait anxiety from those associated with state anxiety. Their compilation of results indicate that shading responses in general appear to be the best indicators of state anxiety, defined as "a transitory emotional reaction that is characterized by feelings of tension and apprehension, and heightened activity of the autonomic nervous system" (p. 315). Auerbach and Speilberger also discuss the difficulty inherent in determining which of the shading variables used across all of the then-current scoring systems provides the best indication of transitory levels of anxiety, or whether a summed score of all shading variables is the most appropriate measure.

In an experiment conducted by Nesser (2000), 80 participants were randomly assigned to either a stress induction group or a control group. Participants in each group completed a timed neuropsychological task, the Rorschach, and the State Trait Anxiety Inventory, with periodic, uncontrollable sound bursts generated to members of the experimental group. The sound burst was considered to reliably induce stress as it had been applied to participants in a pilot study while their skin conductance was monitored, and a significant increase in conductance was associated with the presence of the aversive noise. An ANOVA yielded a significant difference between the groups in the number of

shading responses (*C'*, *V*, *T*, and *Y*) and, in a separate analysis, diffuse shading (*Y*) responses given on the Rorschach, with the stressed experimental group providing greater numbers of these determinants. Nesser also hypothesized that the experimental group should produce greater numbers of inanimate movement responses (*m*) as a result of the stressful independent variable, but failed to find a significantly greater number of such responses in the experimental condition. In describing the meaning of shading responses, Nesser states that

> Examinees who generate shading responses seem to become overinvolved with the demands of the task. They are distracted, and presumably bothered, by the intricacies within the stimuli, and this distraction is associated with diminished efficiency and poor problem-solving. Furthermore, shading responses are associated with distress because examinees feel unable to mount appropriate coping strategies in the ambiguous task. In contrast, examinees who generate form percepts are satisfied with their responses even though they may be inconsistent with the blot contours (p. 9).

This points to the idea that arousal associated with the use of shading responses in general is tied to the immediate experience of the examinee as they associate to the blot. Another important hypothesis in this study was that participants' attributional style, dichotomized as either optimistic or pessimistic, would mediate the effect of uncontrollable stress on the consequent number of shading, diffuse shading and inanimate movement responses. Individuals with a positive attributional style are described as attributing positive environmental occurrences to stable, global, internal characteristics, and negative occurrences to external factors, while those with a negative attributional

style have an inverse tendency. Based on a sample of the 15 most optimistic and 15 most pessimistic individuals in the experimental and control conditions, no significant interactions were found between treatment condition and attributional style. Interestingly though, regardless of treatment condition, there were a significantly greater number of diffuse shading responses (*Y*) among the attributional pessimists, indicating that explanations for negative events that are pessimistic are seemingly associated with *Y* responses. The overall results, however, seem to buttress the notion that diffuse shading responses, and apparently shading responses in general, can be reflective of situational distress. Nesser concludes that shading codes in general are thus capable of signaling psychological and biological arousal related to uncontrollable stress.

Post hoc analyses conducted as part of this study also provide useful information. Despite the fact that the experimental condition in this study did not lead to greater numbers of *m* responses, a significant correlation was found between *m* responses and reports of anxiety. However, a significant relationship was not discovered between the numbers of *Y* and other shading responses in a protocol and reported anxiety or other psychological experiences that have been theoretically associated with the presence of these shading variables. In part, the experimenter attributes this to the nature of the instrument used to measure these experiences, which was created and used solely for this study, and therefore not thoroughly validated.

Eells and Boswell (1994) designed an experimental situation that ostensibly induced anxiety and/or frustration, followed by the administration of the State-Trait Anxiety Inventory and the Rorschach. A 2x2 Analysis of Variance did not yield a significant difference between weighted scores of diffuse shading or inanimate movement

responses between the conditions, which included a control, threatened shock, and an impossible task condition, and a condition including both elements of the latter two. As well, neither the weighted sum *Y* scores, nor inanimate movement responses correlated significantly with the State-Trait Anxiety measure. The authors note that their findings are discrepant with other studies such as some of those discussed by Exner, and offer the possible explanation that the effects of the experimental manipulations may have diminished by the time the Rorschach was administered. This serves to highlight the common belief that diffuse shading and inanimate movement may represent affect that is short-lived and situationally specific.

Greenwald (1990) found that diffuse shading did not correlate significantly with the anxiety scale of the Multiple Affective Adjective Checklist (MAACL), though it was strongly associated with the *FM* (animal movement) code on the Rorschach, along with *MOR* (morbid response) and *CF+* (color-dominated form response). In addition, *Y* was significantly correlated with the inanimate movement code. Greenwald thus interpreted her findings as demonstrating that diffuse shading may be reflective of impulsivity, or impulsive press, and high emotional reactivity. In the same study, Greenwald did find that *m* correlated significantly with the MAACL anxiety scale (r = .26). In considering other significant correlations as well, Greenwald felt that *m* "suggests painful inner experience, including anxiety, depression, hostility, low self-esteem, reduced coping skills, and possibly poor reality testing" (p. 777-778). Greenwald also discovered that *T* responses evidenced a significant negative correlation (r = -.25) with the anxiety scale of the MAACL, prompting her to interpret texture as indicating low levels of anxiety, at

least when found in moderate frequencies. This finding is at odds with the hypotheses and results of other studies.

In another study conducted by Greenwald (1999), the sum of the shading responses *V, T,* and *Y* were found to significantly correlate in an inverse direction with the Neuroticism scale of the NEO-Five-Factor Inventory in a sample of 45 undergraduate students. The Neuroticism scale is a measure that taps experiences of anxiety, impulsiveness, anger, depression, and vulnerability. This finding would seem to be at odds with the customary interpretation of these determinants as potential indicators of dysphoric affect.

Perry et al. (1995) tested the validity of the diffuse shading and inanimate movement determinants as indicators of situational stress by administering a single dosage of amphetamine or placebo to a group of 22 nonpatient college males in a double-blind, crossover experiment. The authors chose to administer amphetamines due to their acceptance in the literature as models of anxiety states. They discovered significantly greater numbers of both categories of response, as scored with the Comprehensive System, for the amphetamine trials relative to the placebo trials. Additionally, the authors examined the amphetamines' specificity of effect on the Rorschach results by analyzing differences in other determinant categories, finding no significant differences between trials for vista, texture, achromatic color, and *WsumC* (the weighted sum of chromatic color responses) scores. Specificity of effect was also seen in that there were no differences between trials in elevations on the Ego Impairment Index, a composite measure of thought disorder on the Rorschach. While these findings lend further support to the interpretation of diffuse shading and inanimate movement, they are inconsistent

with the situationally responsive aspect of the other shading determinants (including achromatic color) reported in previously mentioned research.

Merolle (1999) hypothesized a relationship between the determinants *Y, m, T,* and a measure of state anxiety, the STAI-S created by Spielberger. He reasoned that a significant positive relationship would be found based on both *Y* and *m*'s temporal instability and the fact that the *T* determinant has not been supported as a measure of trait anxiety in previous research with MMPI-based measures despite being considered an anxiety-related determinant by some theorists. He goes on to state that the texture determinant might "depend strongly on fluctuations in the degree of current emotional gratification" (p.26). Based on a sample of 104 university students, Merolle failed to find significant correlations based on his hypotheses. In fact, the only significant correlations he found depicted an inverse relationship between *m* and several measures of trait anxiety, including the STAI-T. In interpreting the results of this study it is important to take into account that time delays between the administration of the self-report instruments and the Rorschach, which at times approached a couple of weeks, clearly may have confounded the outcome.

Rozensky, Tovian, Stiles, Fridkin, and Holland (1987) conducted a study providing further evidence for the interpretation of shading-related determinants as indicators of dysphoric affect with at least some situational responsiveness. Two groups of 20 undergraduates were either assigned to a learned-helplessness condition or a nonlearned-helplessness condition. Both groups were given perceptual-cognitive tasks with feedback on the correctness of their answers as the task proceeded. In the former condition, however, such feedback was not truly dependent on the veracity of the

participants' answers, as all of these individuals were repeatedly told that they were answering incorrectly. Each participant was subsequently administered the Rorschach which was scored with Exner's Comprehensive System. The learned-helplessness group provided significantly greater numbers of a combined category of shading responses (*T, V, Y,* and *C'*), which serves as the right side of an index used in the Comprehensive System known as *eb* (experience base). Experience base is used to delineate the presence of emotional discomfort in a test-taker. When the determinants included in *eb* were analyzed separately however, no significant differences between groups were found.

The relationship between the perceived controllability of a stressor and the determinants *m* and *Y* was examined by McCown, Fink, Galina, and Johnson (1992). Seventy-five male undergraduates were randomly assigned to one of three groups: a no-stress group, a controllable stress group, and an uncontrollable stress group. All participants began the experiment by listening to an aversive noise, which was followed by an assessment of the participants' reaction to the stimulus using the Uncontrollable Stressful Events Scale, which yielded no difference between the groups and provided evidence that the stressor was perceived as uniformly distressing and uncontrollable. All participants were then given a series of anagrams to solve, ranging from easy to unsolvable, after being told that they may need to participate in further tasks that could involve the presentation of the stressful noise or even moderately painful electric shocks. After completion of the anagrams, participants in the no-stress group were told that they would not be exposed to any further aversive events. Participants in the controllable stress group were told that their upcoming set of tasks would involve stressful noise and shocks if they were unable to completely solve more anagrams, and participants in the

uncontrollable stress group were informed that they would receive these aversive stimuli regardless of their upcoming performance on anagrams. Then, prior to this second set of anagrams, all participants were administered the Rorschach. The results of the experiment evidenced significant differences in the number of *m* responses between the no-stress group and the other two groups, but no difference between the controllable and uncontrollable stress groups. Additionally, the no-stress group and the controllable stress groups differed significantly from the uncontrollable stress group in terms of the number of *Y* responses, but the former two groups did not differ from each other. These results thus support the idea that both *m* and *Y* relate to situational stress, but *Y* appears to be most reflective of stress that is perceived as beyond one's control.

Viglione and Exner (1983) examined the utility of shading responses (*Sh*) for reflecting the presence of state anxiety in 60 university undergraduate and graduate students. As mentioned previously, the *Sh* category of responses includes *Y*, *C'*, *V*, and *T*. Each participant in this study was administered a short, 10-item version of Spielberger's measure of state anxiety before being sent to one of two groups. One of these groups involved the use of social-evaluative stress, while the other served as a control group. The experimental group was given several anagrams that were considered to be unsolvable, while the control group was presented with only easily solvable anagrams. Subsequently, the participants in the experimental group were given negative feedback on their overall performance while the control group was told that they had performed well. All participants then completed another short version of the previously administered state anxiety measure, and were then told that they would be given another series of similar anagrams after completion of the Rorschach. After the completion of the Rorschach, all

participants were given a final measure, the Post-Experimental Questionnaire (PEQ), and were evaluated by examiners using an observational measure, the Test Behavior Scale (TBS). Both of these scales were used to assess participants' level of state anxiety. An analysis of these measures indicated that the social-evaluative stress condition was successful in significantly increasing state anxiety relative to the anxiety pre-test in that group and both the pre and post-test in the control group. Contrary to their hypothesis however, no significant differences were found between groups in the number of *Sh* responses. The researchers explain these findings as likely due to the short-lived nature of the anxiety associated with the experimental condition. The two post-Rorschach measures, the PEQ and TBS, yielded evidence that the stress created by the social-evaluative condition had diminished by that point in the experiment. In particular, one PEQ item ("I felt at ease while taking the inkblot test.") did not differentiate the experimental and control groups. The results of this study are consistent with the notion that the distress associated with *Sh* responses can be highly circumscribed.

Chromatic Color:

Of the determinants of interest in the present study, only chromatic color was included as an important response characteristic by Hermann Rorschach when the test was first formulated. As in Exner's Comprehensive System, Rorschach (1921) differentiated between color responses that were form-dominated (*FC*), those that were primarily based on color with form features being of secondary importance (*CF*), and those that were exclusively derived from color features (*C*). Rorschach noted in that early period that individuals who tended to present with affective lability often had more

color responses in their protocols. As well, he thought that greater levels of form usage in color responses indicated emotional stability. Answers coded with *C* were considered to reflect impulsiveness, irritability, and sensitivity. Responses coded *CF* were seen as more common, yet very similar in interpretive value to *C* responses, while *FC* responses were considered indicative of affective modulation.

Early Rorschach systematizers maintained an interest in test-takers' use of color in responding to the blots. For example, Exner (2003) points out that Piotrowski generally agreed with Rorschach on the meaning of the color determinant, adding that he considered *CF* and *C* responses to indicate "situations in which the cognitive elements are overly relaxed, or even possibly overwhelmed by, affective states" (p. 324). Exner himself, in discussing the place of chromatic color in the Comprehensive System, also feels that color dominated responses may indicate affective lability that is not shaped by cognition due to an intense emotional experience, or the expression of an impulse. In support of the color-affect hypothesis, Exner provides evidence for developmental changes in the use of chromatic color on the Rorschach (i.e. greater levels of form dominance over time), which he interprets as highlighting advances in emotion modulation with maturity. He also notes that, relative to non-patients, patient groups tend to have higher proportions of protocols in which a combined category of *CF* and *C* responses outnumber *FC* responses. He points to the likelihood of emotion control difficulties among patients as a probable explanation for this finding. He also reports findings demonstrating greater levels of aggressiveness and impulsiveness among individuals with higher frequencies of *CF* and *C* responses. For example, he discusses the work of Miller, who found that couples with a domestic violence history produced

Rorschach protocols with significantly greater numbers of *C* responses and significantly fewer *FC* responses than the protocols of couples without such a history. Additionally, the findings of some of Exner's earlier research yielded a relationship between *WsumC* (a composite of weighted chromatic color scores) and scores on a scale designed to measure sensation seeking. All of these findings seem to support the hypothesis that participants' use of chromatic color reflects affective characteristics.

The notion that the *FC* response represents a tendency toward a stabilized, more controlled emotional experience than the *CF* or *C* response is supported by the work of Greenwald (1990, 1991). In one study (1990), she discovered that *FC*+ responses (the "+" indicating adequate form quality) failed to correlate with *CF*+ responses in a sample of 62 university students. The *FC*+ responses correlated with other form-dominated responses, which Greenwald felt "suggests that the implied modulated affective responsiveness may not be associated with emotional responsiveness in general" (p. 778). In her other study (1991), Greenwald examined correlations between the Rorschach and the Sixteen Personality Factor Questionnaire for the same 62-person sample. Her findings indicate that *FC*+ is associated with lower levels of anxiety and higher levels of ego strength and other measures that suggest good functioning. The findings related to the *CF*+ response are consistent with its interpretation as an indicator of a "passive response to affect, relatively unmodulated by cognitive considerations" (p. 713). Interestingly, Greenwald also found correlations that are inconsistent with some common Rorschach interpretations, such as a relationship between *M* (human movement) and a self-report measure of anxiety. In considering the overall mixed support for the meaning

of Rorschach determinants in these studies, it is important to keep in mind that a very large number of correlations were obtained, which may have led to some chance findings.

Alimena (1962) utilized physiological data to test the hypothesis that attention to color on the Rorschach is related to affective experience. In this study, extinction rates of galvanic skin response served as the dependent variable. Eighteen male and eighteen female college students participated in the study, which involved the projection of different versions of card X on a screen. One of these versions was the standard colored plate, another was altered to appear as black and white, and a third was simply an outline of the blot's form. The participants were exposed to each plate in varying orders for a duration of one-and-a-half seconds each, and were instructed to call out words corresponding to the salient feature of the blot version projected (i.e. "color", "shading", "form", or "light" if only light was projected). The extinction of GSR was achieved when a participant reached a previously recorded basal level of arousal, which was the level preceding stimulation. The number of presentations of a particular version of the blot required before the basal level of GSR was reached was recorded for each participant. Alimena found that the extinction time for the colored version was significantly greater than that of the other versions for both males and females. This study provides some support for the color-affect hypothesis, but does not provide evidence of differences in the magnitude of affective arousal between the versions of the blot, only the duration of arousal. Additionally, the nature of the study does not allow for discriminations in arousal associated with particular determinant codes used in the Comprehensive System.

As with other Rorschach determinants examined in the present study, the meaning of color responses has been somewhat controversial. Frank (1976, 1993) conducted a review of available research on the color-affect hypothesis, concluding that there is inadequate evidence that an individual's use of color on the Rorschach can tell an examiner anything about their affective state or emotional responsiveness. He discusses the possibility that other factors, such as a personal preference for certain colors, may influence an individual's response to the blots. His review of studies included some that utilized autonomic nervous system activity, observed behavior, induced emotional reactions, objective test data, and associations to the color dimension of the blots. The overall results indicate that there may not be a consistent relationship between use of color and affective states or characteristics. One of the few studies that Frank reviewed that lent some support to the color-affect hypothesis was that of Plesch (1951), who relied on an unusual sort of autonomic data. Plesch compared the protocols of 50 participants suffering from Rosacea, excessive blushing, or both, to the protocols of 50 age, gender, and socioeconomic status-matched control participants. The former group produced twice as many *CF* + *C* responses as *FC* responses, while the reverse was true of the latter group. As blushing is construed as reflecting prominent emotionality, this seems to provide some support for the color-affect hypothesis. As Frank found such supportive results relatively hard to come by, he concluded that, "clinicians should not interpret persons' responses to color as representative of the vicissitudes of their emotional life; the data do not justify such an interpretation" (1993, p. 13).

Hughes (1949) conducted a study yielding negative findings, with more direct implications for the present study. This study compared color responses to all other

responses on the Rorschach through numerous measures of autonomic activity measured by a polygraph, including respiration rates, galvanic skin response, heart rate, blood pressure, and pulse pressure, among 17 male and 15 female university students. None of the physiological indices were found to be significantly different between color and non-color responses within a 15-second period leading up to, and following, a response, with the exception of one blood pressure measurement, the number of seconds before response when diastolic pressure began to change. Although this last finding was in the expected direction, the author, based on the overall results, concluded that "so-called 'affective' and 'non-affective' Rorschach responses were not differentiated physiologically by the methods employed in this study. In fact, responses to color as such may not indicate affect at all" (p. 87). Of course, from the point of view of the present study, there are at least two problematic points in Hughes' conclusions. First, to the extent that shading, inanimate movement, minus form quality, and special score responses are related to affective experiences, their exclusion from focus in this study could raise the physiological arousal level of the "non-affective" category. Second, the author did not differentiate between *FC*, *CF,* and *C* responses. As noted previously, the *FC* response is apparently different from the other two color response categories in that it reflects an adaptive modulation of affective experience. As Exner (2003) has found, *FC* responses are the most frequent color responses among adult nonpatients in the Comprehensive System normative data. This clearly may have clouded the results of Hughes' study.

Minus Form Quality and Special Scores:

Less research is available in the literature concerning the implications of minus form quality responses and special scores for affective experience. Much of what is available concerning this connection is largely theoretical. According to Exner (2003), Rorschach responses that are scored with a minus form quality "can be caused by faulty processing, however, in most instances the processing is adequate but emotional elements, ideational sets, and/or preoccupations prompt a misidentification of the stimulus features" (p. 372). Peebles-Kleiger (2002), in a discussion about the sequential analysis of Rorschach responses, describes poor form quality as a "deterioration in the person's capacity to stay attuned with what others are seeing. In that moment, objective perception has become overshadowed, handicapped, or distorted by personal concerns" (p. 27). Greenwald (1990) found a significant correlation ($r = .28$) between the percentage of minus form quality responses in a protocol and a measure of external locus of control. She interpreted this finding as suggesting that individuals who see control over their life as being beyond their influence are also likely to distort perceptions of realty.

As noted previously, Weiner (2003) views minus form quality responses as a "failure in adaptive functioning" (p. 188). He also discusses a few possible explanations of this breakdown in functioning, which are all related to the experience of distress: the content of a participant's response to a particular card may serve as a source of distress that troubles the respondent; some structural characteristic of a response may be distressing to the respondent (e.g. the frequent pairing of minus form quality with chromatic color responses may indicate disruptive concerns with the expression of

feelings); an unexpressed feature of the blot that is not explicitly utilized by the respondent may be construed as disturbing (i.e. what a card tends to "pull" for in terms of content and determinant use); or as a reaction to distress associated with a previous response or card.

Determining the quality of individual responses is a process utilized in a sequential analysis of a test-taker's Rorschach protocol. These response patterns can theoretically be used to develop an understanding of an individual's underlying concerns. Peebles-Kleiger (2002) notes that, in examining the pattern of scores, the experience of distress or "destabilization" for a participant can be seen, in part, to the extent that certain Comprehensive System structural qualities are present in a response. She writes about the generally agreed-upon usefulness of achromatic color, shading, and inanimate movement responses in alerting the clinician to a test-taker's distress, along with an analysis of form quality, form dominance, the severity of special scores and test-taker behavior. Although Weiner (2003) notes that, among these indicators, "form level is the easiest to recognize and may in fact carry the most weight in deciding whether a response should be considered of good or poor quality" (p. 246), both Peebles-Kleiger and Weiner seem to agree on the likely usefulness of special scores in pointing to a disruption of functioning on the part of the test-taker. Although there are numerous special scores, they focus on those that denote "cognitive slippage" as useful indicators of a test taker's disruption in forming a response.

Exner (2003) provides an overview of these codes, which include deviant verbalizations (*DV*), deviant responses (*DR*), incongruous combinations (*INCOM*), fabulized combinations (*FABCOM*), contaminations (*CONTAM*), and inappropriate logic

(*ALOG*). Deviant verbalizations are words that are inappropriately used in a response. This may involve a redundant use of words or neologisms, which include nonsensical words and words that are incorrectly substituted for an appropriate word that is within the test-taker's range of knowledge. Deviant responses include phrases that are unusual and out of touch with the task of reporting what the blot may be, and lengthier elaborations that are irrelevant to the response. Incongruous combinations are found in responses in which a very unlikely or impossible characteristic is attributed to a particular object. Fabulized combinations are found in responses that suggest a very unlikely or impossible relationship between two or more objects. Contaminations refer to responses that involve a fusion of two or more response objects into one unrealistic response. Inappropriate logic is scored when a test-taker employs strained, atypical logic to justify a response. Four of these special scores (*DV*, *DR*, *INCOM*, *FABCOM*) are also rated in terms of severity, with Level 1 scores being relatively mild in terms of response distortion, and Level 2 representing a greater level of cognitive disruption. In the Comprehensive System, these six special scores make up an index (*Wsum6*) which is comprised of the weighted sum of such codes in a protocol. This index provides a measure of a test-taker's level of "difficulty in formulating or expressing aspects of thinking" (p. 440). At relatively high scores on this index, a formal thought disorder is more probable. Given the importance of minus form quality and these special scores in sequential analyses, it might be reasoned that a particular response that includes shading, achromatic color, inanimate movement, or even chromatic color that is not form-dominated might indicate some affective response, but when coupled with minus form quality and/or special scores

indicating cognitive slippage, a greater level of affect, presumably felt as distress, is implicated.

Statement of the Problem

Based on this relatively brief review of the literature, it seems that there is mixed evidence for a link between the use of shading determinants, inanimate movement, or color determinants and affect, and a paucity of evidence for the usefulness of minus form quality and special scores as indicators of distress. The support for such a relationship appears to be somewhat more consistent for the shading determinants, however, and particularly so for the determinants *m* and *Y*. The purpose of this study is to refine and extend previous research by assessing a more inclusive group of hypothesized affect-related Rorschach codes as employed in the Comprehensive System. It is proposed that Rorschach responses involving the use of any or all of the determinants *C', m, T, V, Y, C* (excluding *FC*), and/or minus form quality and cognitive special scores, will be associated with greater levels of autonomic arousal, quantified through the use of heart rate and skin conductance measurements, as compared to responses lacking these codes.

CHAPTER II

METHOD

Participants

Six male and eighteen female freshman and sophomore undergraduate students enrolled in an introductory psychology course at the University of Tennessee, Knoxville participated in the study. Participants were recruited through the use of a sign-up sheet located in a psychology classroom building on campus. Potential participants added their names and contact information to this sheet, and were later contacted by an undergraduate research assistant. Individuals who expressed interest in the study, and whose schedules allowed for it, were given an appointment to be seen individually. All participants were compensated for their participation by receiving extra credit to be applied toward their final grade in their introductory psychology course.

Apparatus

The equipment used in this study consisted of the standard set of 10 Rorschach inkblot cards, and a BIOPAC MP100 System designed and produced by BIOPAC Systems Incorporated, Goleta, California. The MP100 was used to measure participants' heart rate in beats-per-minute via snap electrodes, and skin conductance response in micromhos (Mho), the traditional unit of conductance, through electrodermal response transducers connected to participants' fingertips with Velcro straps. Data were observed

and recorded with a personal computer and monitor, employing software provided by BIOPAC.

Procedure

Upon each participant's arrival for the study, they were provided a written informed consent form, and directed to the room where testing was to proceed. This room contained a table with two chairs, among other furniture, that was placed against a wall with a two-way mirror allowing the research assistant, monitoring physiological data in the adjacent room, to view the testing process. All participants were informed of his presence and role in the study. The experimenter was able to see into this other room through the mirror due to a constant light source in that room. This allowed the assistant to communicate as necessary with hand signals. All but one of the potential participants chose to enter the study. The individual who declined did so after learning that he had nearly reached the limit for the amount of extra credit attainable for his psychology course.

Each participant was provided a general overview of the study after signing his or her informed consent form. This involved informing them of the study's purpose, focusing on our desire to better understand the relationship between psychological testing and autonomic arousal. The Rorschach was then introduced to the participant following standard Comprehensive System procedures. This, of course, included asking whether the participant had heard of the Rorschach. Although several individuals had, none of them had ever been exposed to the test before. Subsequently, the nature of the physiological measures was described, and the participant was assured that there was no

danger involved in using the MP100 system. The experimenter then demonstrated the procedure for properly affixing the self-adhesive electrodes for the heart rate monitor (one each on the left and right floating ribs, and one just under the left collar bone), answered any questions, and left the room briefly to allow the participant to adhere the electrodes him or herself. Upon returning, the experimenter attached two skin conductance transducers to the participant's first two fingertips on his or her left hand. The importance of restricting physical movement as much as feasible, and restricting speech to test responses during the experiment was described, although each participant was informed that they would be allowed to hold each card with their right hand during testing. The participant was then informed that they would be given a five-minute period to relax, and the experimenter left the room. It was at this point that the research assistant began to record physiological data. He also started a stopwatch timer to track the five-minute baseline period.

At the end of the baseline period, the experimenter reentered the testing room, sat beside the participant, and began testing without any further information concerning the Rorschach. All responses were recorded with paper and pencil by the experimenter. The presentation of Rorschach cards was not counterbalanced in an effort to preserve ecological validity. The participant was handed each card, followed by the standard prompt, "what might this be?". At this point, for each card, the assistant in the adjacent room entered a marker in the MP100 program to denote the participant's receipt of a card. The assistant also entered markers when a participant began to verbalize a response, allowing for data analytic procedures to be described later. All standard Comprehensive System procedures were followed during testing with the exception of

one modification. When the participant was finished with a card, the experimenter took it from him or her, and a two-minute relaxation period, which the participant had been prepared for during his introduction to the experiment, was begun. The assistant used a stopwatch to track these periods and at the end of each one he signaled the experimenter by raising his hand. At this point, the next card was introduced to the participant. The purpose of this procedure was to prevent physiological arousal from being carried over from one card to the next. At the end of the response phase, the participant was instructed to remove the skin conductance transducers and heart rate electrodes. A standard inquiry phase was then completed. The participant was then awarded his extra credit slip and thanked for his or her participation.

Data Analyses

In selecting data points from the stream of skin conductance and heart rate measurements, the highest level of both dependent variables was selected for each participant's responses within an interval spanning three seconds prior to the verbalization of a response, to three seconds after. This interval was chosen as it allowed for equal periods between responses for all participants in the study without overlap from one response interval to the next. As the data were collected, it became apparent that only the first response per card for each participant would be analyzable. Although this tactic precludes the use of many responses, this was deemed necessary as responses offered after the first one on each card were often artificially inflated in terms of the dependent variables due to the effect associated with the first response.

Several analyses were planned in an effort to determine which, if any, of the codes of interest in this study would be associated with heightened autonomic activity. An initial analysis was designed by grouping all of the responses containing any, or all, of these codes, and comparing the mean skin conductance and heart rate of these responses with the mean of all other responses within participants. This initial analysis was chosen as it provided the most powerful test due to the fact that all of the 24 participants provided at least one response containing one or more of the codes of interest. Subsequent analyses were planned based on logical groupings of the codes of interest. Following the same within-subjects procedure just described, the mean of the responses for each participant that contained codes indicating what is typically thought of as state anxiety (*m* and *Y*) were compared to the mean of the participants' other responses *excluding* those that contained other codes of interest in this study. The other analyses, following this same procedure, examined separately the codes thought to more closely indicate trait anxiety or irritating affect (*C'*, *T*, and *V*), affective lability (*CF* and *C*), perceptual distortion (minus form quality), and cognitive slippage (*DV*, *DR*, *INCOM*, *FABCOM*, *CONTAM*, and *ALOG*). As each of these codes is relatively rare in the protocols of normative groups, a separate analysis for each code would have involved very small numbers of participants and greatly reduced power to detect meaningful differences. All analyses were conducted separately for skin conductance and heart rate, due to the notion that the former measure is a better indicator of anxiety (Fowles, 1986, 2000).

CHAPTER III

RESULTS

Reliability

The author scored all of the Rorschach protocols collected for this study. An advanced graduate student in clinical psychology scored a random subset of 13 of these Rorschachs. This allowed for a reliability analysis using kappa coefficients. As the hypotheses involving most of the codes in question for this study are not differentiated by the presence and relative importance of form, any response for which both scorers agreed on the presence of one of the codes in question was marked as an agreement for that code. For example, if the scorers coded a particular response as *FY* and *YF*, respectively, then agreement was reached on the presence of the diffuse shading determinant for that response. Similarly, if both scorers agreed on the presence of any of the cognitive special scores, regardless if it was the same cognitive special score, it was coded as an agreement and that response was used as part of the calculation for an individual's mean physiological data for the special scores analysis. This pattern did not hold for the chromatic color responses. Agreement on such responses was considered to be reached only if both scorers agreed on whether the response was form dominant or not. This is based on the generally accepted notion that *FC* responses reflect adaptive functioning and are qualitatively different from the other chromatic color responses (Exner, 2003; Greenwald, 1990, 1991).

The kappa coefficients generated from this subset of protocols ranged from .60 to 1.00, indicating a range from good to excellent agreement. For both *T* and *V*, kappa reached 1.00 due to perfect agreement on the very limited number of such responses in this data set (table A-1).

Comparison of Means

As some (e.g. Levy, 1950) have noted the early hypothesis that different Rorschach cards may pull for different levels of affect, initial within-subjects analyses of variance were conducted comparing the mean skin conductance and heart rate for each card to determine the necessity of using card as a covariate in further analyses. An alpha level of .05 was used for this and all subsequent tests of significance. For both the test of skin conductance and heart rate, violations of the assumption of sphericity were evident based on Mauchly's test ($p < .001$), necessitating the use of the Greenhouse-Geisser correction. For both the test of skin conductance, $F(2.91, 66.83) = .59$, $p = .62$, and heart rate, $F(3.54, 81.38) = 1.27$, $p = .29$, there were no significant differences between cards (see table A-2 for means and standard deviations). These results are in agreement with findings by Levy (1950). It is important to note, however, that without counterbalancing the presentation order of the cards, the differential effect of serial position and card pull is unknown.

All subsequent analyses were based on one-tailed tests due to the directional nature of the hypothesis. An initial within-subjects ANOVA ($N = 24$) comparing the mean skin conductance level in micromhos associated with responses including any or all of the codes of interest in this study to the mean associated with all other responses did

not yield a significant difference, $F(1, 23) = .18, p = .34$. The same within-subjects analysis comparing the mean heart rate between the former and latter groups of responses in heartbeats-per-minute also failed to reach significance, $F(1, 23) = 3.42, p = .96$ (table A-3).

A within-subjects ANOVA including only the subset of individuals providing responses that yielded *m* and/or *Y* codes ($n = 14$) was also conducted. For the measure of skin conductance, the group of responses including one or both of these codes did not differ significantly from the group of all other responses *excluding* those yielding other codes of interest in this study, $F(1, 13) = 1.95, p = .10$. These groups of responses failed to differ in terms of heart rate as well, $F(1, 13) = .98, p = .83$ (table A-4). The analysis of *C'*, *T*, and *V* code responses ($n = 10$) by this same procedure failed to evidence a significant difference between the group of responses including one or more of these codes as compared to all other responses for both skin conductance, $F(1, 9) = .50, p = .25$, and heart rate, $F(1, 9) = 1.61, p = .88$ (table A-5). The test of *CF* and *C* responses ($n = 16$) was similarly insignificant for both skin conductance, $F(1, 15) = .36, p = .30$, and heart rate, $F(1, 15) = 2.85, p = .95$ (table A-6), as was the test of minus form quality responses ($n = 20$), $F(1, 19) = 1.36, p = .87$ for skin conductance, and $F(1, 19) = .83, p = .82$ for heart rate (table A-7). Lastly, the test of responses including any of the special scores of interest in this study did not evidence significant differences between these and other responses ($n = 15$), $F(1, 14) = .62, p = .22$ for skin conductance, and $F(1, 14) = 1.91, p = .91$ for heart rate (table A-8).

CHAPTER IV

DISCUSSION

Conclusion

Based on the results of the present study, there does not appear to be a significant relationship between the use of the Rorschach codes in question, and autonomic arousal. These findings are consistent with those of some similar studies (e.g. Hughes, 1949; Vine, 1970), but at odds with others (e.g. Forrest & Dimond, 1967). Importantly, however, the present study is the first to examine this question with Comprehensive System coding classifications.

The results suggest that respondents' affective experience does not significantly vary between responses characterized by good form quality, unremarkable determinants, and an absence of cognitive special scores, and those that would be considered a signal of distress, particularly from the point of view of sequence analysis strategies. Indeed, the present findings seem to be most at odds with the notions set forth in this particular interpretive strategy. The presence of one or more of the codes of interest did not reflect moment-to-moment fluctuations in autonomic arousal for this sample. Therefore, the use of these codes as markers of relatively circumscribed destabilization, distraction, and the presence of underlying concerns may not be as useful as has been hypothesized (Nesser, 2000; Peebles-Kleiger, 2002; Weiner, 2003).

A review of the literature related to the potential of particular Rorschach codes in signaling the presence of affective experience in examinees yields several seemingly

well-designed studies which have supported the usefulness of some of these codes as indicators of arousal, particularly *m* and shading-related codes (e.g. McCown et al., 1992; Perry et al., 1995; Rozensky et al., 1987). The present findings might be reconciled with the results of these previous experiments if one considers the possibility that some of these codes *do* reflect affective arousal in examinees, but not at a moment-to-moment level. Perhaps, for example, the presence of *m* or some of the shading-related codes in an individual's Rorschach reflects an increase in that person's baseline level of arousal, which could conceivably be carried over throughout the testing period. If this is the case, summary statistics might be the most useful indicator of arousal for any given examinee.

A couple of potential problems with the present study merit discussion. First, the length of the time interval from which skin conductance and heart rate data were selected was relatively short. As mentioned previously, this was necessary to prevent overlap from one response interval to the next. A procedural change, such as restricting participants to one response per card, would have circumvented this problem, but it was decided that allowing participants to verbalize as many responses as they could would improve the chances of tying physiological arousal to percepts that participants were forming. If participants were restricted to one response per card, numerous percepts would presumably go unacknowledged, including some that would have indicated an increased level of participants' arousal during the presentation of a card, assuming the hypotheses of the study were supported. As it is, with standard Rorschach administration, roughly 65 to 75% of potential responses may be discarded by examinees (Exner, 2003). Also, as mentioned previously, the prevalence of many of the codes of

interest in this study is low. This precluded an independent examination of each of the codes. The possibility remains that one or more of these grouped codes relates to a circumscribed affective experience. In order for future studies to shed light on this possibility, large numbers of participants would be needed in order to generate enough protocols with each of these codes.

Another important consideration is the fact that relatively small numbers of participants provided responses allowing for the separate analyses conducted. Some significant results may have been found if these analyses had afforded greater levels of power. The test of the *m* and *Y* codes, for example, could arguably have yielded a significant result given a larger sample size for that test. Finally, it is important to consider the nature of the sample, which was made up of presumably psychologically healthy undergraduate students. A possible avenue for future research might be to utilize a clinical sample in an effort to determine any differential relationship between the meaning of these codes and levels of psychopathology.

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Appendices

Table A-1

Kappa Coefficients

Code	Kappa
Minus form quality	.83
C'	.89
C	.87
m	.83
T	1.00
V	1.00
Y	.80
Special scores	.60

Table A-2

Means and Standard Deviations for Skin

Conductance and Heart Rate by Card

Card	Mho		BPM	
	$\bar{x}$	SD	$\bar{x}$	SD
I	17.28	7.37	82.89	14.39
II	16.96	6.77	84.11	13.34
III	16.95	7.24	82.54	13.43
IV	17.15	7.58	82.81	12.43
V	16.68	7.47	82.17	12.67
VI	17.82	7.76	82.14	12.22
VII	17.21	7.64	82.82	12.77
VIII	17.46	7.41	82.03	11.56
IX	17.25	6.89	82.75	11.36
X	17.49	6.97	82.17	11.98

Note. Mho = micromhos; BPM = beats per minute

Table A-3

Means, Standard Deviations, and Significance Levels for Repeated Measures ANOVA for All Codes of Interest (N = 24)

	Codes of Interest		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	18.67	8.01	18.44	7.26	ns
BPM	91.47	11.41	93.33	13.54	ns

Note. Mho = micromhos; BPM = beats per minute

Table A-4

Means, Standard Deviations, and Significance Levels for Repeated Measures ANOVA for *m* and *Y* (n = 14)

	m and *Y* responses		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	21.45	9.19	19.59	6.93	ns
BPM	91.78	10.61	93.54	11.03	ns

Note. Mho = micromhos; BPM = beats per minute

Table A-5

Means, Standard Deviations, and Significance Levels for

Repeated Measures ANOVA for *C'*, *T* and *V* (n = 10)

	C', *T* and *V* responses		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	18.19	9.44	17.69	8.57	ns
BPM	87.42	10.12	90.81	13.50	ns

Note. Mho = micromhos; BPM = beats per minute

Table A-6

Means, Standard Deviations, and Significance Levels for

Repeated Measures ANOVA for *CF* and *C* (n = 16)

	CF and *C* responses		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	19.91	7.90	19.37	7.14	ns
BPM	87.50	10.38	90.20	12.92	ns

Note. Mho = micromhos; BPM = beats per minute

Table A-7

Means, Standard Deviations, and Significance Levels for Repeated Measures ANOVA for Minus Form Quality (n = 20)

	Minus form quality responses		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	18.19	7.36	18.68	7.17	ns
BPM	91.99	10.78	92.81	11.91	ns

Note. Mho = micromhos; BPM = beats per minute

Table A-8

Means, Standard Deviations, and Significance Levels for Repeated Measures ANOVA for Cognitive Special Scores (n = 15)

	Special Scores responses		Other responses		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	
Mho	19.29	9.05	18.68	7.70	ns
BPM	91.18	12.53	93.46	14.68	ns

Note. Mho = micromhos; BPM = beats per minute

VITA

Chad Ryan Sims was born in Terre Haute, Indiana on July 7, 1974, and was raised both there and in Florida. He graduated from Florida Atlantic University with a B.A. in anthropology in 1997, and received a second B.A. with a major in psychology at the University of South Florida in 2002. He currently resides in Knoxville, Tennessee with his wife, April, where he is completing his third year of the doctoral program in clinical psychology at the University of Tennessee.