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Examining the Impact of Hostile and Communion Films on Self-Reported Experiences
and the Rorschach’s Interpersonally Related Thematic Codes and Critical Content Codes

by

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Submitted to the Graduate Faculty as partial fulfillment of the requirements for the
Doctor of Philosophy Degree in Clinical Psychology

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August 2015
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An Abstract of

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This study reviews methodological issues, theoretical framework issues, and appropriate criterion selection issues related to Rorschach research, as well as conclusions from debates about the Rorschach that have occurred during the past few decades. The results of this review provide guidelines to evaluate and potentially establish score validity. A process-focused model was applied as the main method to validate the Rorschach variables selected for use in this study. The Interpersonal Circumplex model was utilized as the theoretical framework for selecting the experimental conditions and the relevant Rorschach variables for validation in each experimental condition. For the appropriate experimental criterion selection, mood induction procedures were implemented by using two clips from the films 300 and Braveheart to elicit cognitive-affective mindsets on two overlapping emotional-interpersonal dimensions. One is an aggressive–hostile dimension, and the other is a communion–love dimension. Eleven Rorschach Thematic and Content Codes that were expected to be associated with the Interpersonal Circumplex model were selected as the major variables for validation. The supplemental predictor and criterion measurements for this study consisted of two self-report scales, the Interpersonal Questionnaire (IPQ; Trapnell & Broughton, 2006) and the Post-Film
Questionnaire (PFQ; based on Hsiao, Meyer, & Mihura, 2012), and two indirect measurements, the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) and the Conditional Reasoning Test of Aggression (CRT–A; James, 1998; James & McIntyre, 2000). A total sample of 216 participants was recruited and produced 207 valid protocols for final data analyses. There were 141 participants in the two experimental groups, the Aggression and Love conditions. They completed the IPQ and CRT-A at baseline before watching one of the short movie clips. Participants provided Response Phase communications to the 10 Rorschach inkblots immediately after watching one of the short movie clips. Participants then completed the PFQ and SC-IAT, which was then followed by the Clarification Phase of the Rorschach. Sixty six of the participants were recruited for the control group. They followed the same research procedure except they did not watch a short movie clip. Two main hypotheses and one supplemental hypothesis were generated to validate the PFQ and selected Rorschach variables. The initial data analyses supported the successful production of experimental effects in both conditions through self-report, but failed to find the expected effects on Rorschach codes and the SC-IAT. To determine if the act of completing the SC-IAT between the Rorschach Response Phase and Clarification Phase may have contributed to these negative results, additional data analyses were conducted to further explore the Rorschach codes’ validity in capturing the carryover effect from the films by limiting data analyses to communications made during the Response Phase. The results suggested that AGC and AGM were sensitive in capturing the carryover effect in the Aggression condition, while newly created codes, one dealing with receptivity to color in the inkblots (ColorLoc) and the other quantifying pleasant and colorful contents (PCC), were
sensitive in capturing the carryover effect in the Love condition. In contrast to hypotheses, Aggression–Hostility and Communion–Love dimensions generated from the baseline IPQ and CRT-A did not contribute additive effects to the prediction of any of the results. However, gender was a major effect, as males responded more positively to the Aggression film than females, which led to a number of main effects and interaction effects on the self-report and Rorschach based criteria. For instance, AGC was most elevated for males in the Aggression condition and least elevated for females in the Love condition. Potential methodological issues were discussed and recommendations for future study were provided.
Dedication

Broadly, I dedicate this dissertation to all of my patients, friends, and family near and far, who have frustrated me, questioned me, challenged me, supported me, and encouraged me during the process of my professional training and development. All of these helped me to reflect, reorient, redirect, recognize, and redefine myself from the past, in the present, and to the future.
Acknowledgements

This dissertation would have been impossible if there were not support from the countless number of people throughout the years of my professional training and development in graduate school. Without the support in various ways from these people, my career path in the field of clinical psychology might have been discontinued. I would like to use this opportunity to acknowledge some specific people who have been crucial in assisting me to complete this process successfully.

First, I would like to thank Dr. Steven K. Huprich, my previous advisor when I pursued my master degree at Eastern Michigan University. Without you, Dr. Huprich, I would not be able to continue to pursue Ph.D. training in the United States. Your encouragement, support, and expert guidance led me to join the Society of Personality Assessment. Thank you for introducing me to this wonderful association and creating the opportunities for me to meet with so many famous and wonderful scholars that I never thought I would have a chance to interact when I was reading their seminal articles in Taiwan prior to pursuing graduate training in the United States.

Second, I would like to reveal my sincere appreciation to Dr. Gregory J. Meyer, my academic advisor, supervisor, mentor, teacher, and friend. Without you, Dr. Meyer, I would not be able to form my professional goals, develop my personal interests, integrate these two main identities into a congruent self, and gain the sense of being a grounded person professionally and personally. There is an old saying in Chinese that emphasizes the value of the relationship between the mentor and the mentee. It says “Being a mentor to a mentee for a day is equivalent to being a father to a son for a life.” During the past six years of working with you, you have been my role model for how to be a teacher.
when I was assigned the role to be a graduate assistant and independent course instructor, how to be a clinical psychologist when I was performing the role as a trainee during my externship training as well as my current internship training, how to be a researcher when I was given the opportunities to participate in and conduct research projects, and how to be a scholar when I have the chances to present the research projects to and interact with an audience that is full of professionals with background in psychological assessment during the annual conference meetings at the Society for Personality Assessment. Most importantly, you have been a role model for me in terms of learning how to be a whole person that can be as genuine, congruent, and cohesive as best as I can, at the same time, maintaining the sense of self with integrity and solidity. The training I received from you was pervasive; it not only impacted my professional, but also my personal identity development. It was my honor to spend these wonderful six years of life experience with you and I sincerely wish that we can continue to expand our already established relationship into the future career that is ahead of us in working for the continuing development of R-PAS.

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psychologist focused on psychological assessment. The interactions among lab members have been always supportive, fun, interesting, insightful, and, at times, entertaining. Some of the members already have shed light to other members on how our future could be after graduating from our lab, and I am glad that I can contribute to the future lab members by shedding another light on how their future could be after graduating from our lab.

I would also like to thank my colleagues from Taiwan who have shared similar learning experiences on how frustrating and rewarding it could be when pursuing graduate training in clinical psychology in the United States. Specially, I am honored to have the opportunities to work with Wen-So Su conducting the Form Accuracy Ratings project as the first international project of mine that contributed to the development of R-PAS. In addition, it was also my honor to serve as the inter-rater reliability rater in Wen-So’s dissertation project, which was the first study conducted in Taiwan comparing the CS and R-PAS. In addition to Wen-So, it was also my pleasure to work with Hui-Ying (Catherine) Chu to collaboratively collect R-PAS normative sample from Taiwan in 2014. During the process of this collaboration, I appreciated her inputs and recommendations on making the translation of R-PAS materials even smoother so that they can be easily administered in Mandarin or Taiwanese. This collaborative experience has inspired me wanting to speed up my completion of this dissertation project so that I can continue to conduct R-PAS research after obtaining my PhD degree.

Moreover, I would like to thank my parents, Bi-Lu Hsiao and Pi-Shys Chang-Hsiao, for their bearing with my stubbornness, and not carrying out my filial piety duty during the past 10 years of me being away from them and pursuing my career goal in the
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study integrated with the theories, research designs, and measurements that drew from different subfields of psychology. Your questions and recommendations were invaluable and advanced my perspectives on this study to a more thorough understanding of its potential implications. Incorporating your feedback into this dissertation has made this research project even more valuable and meaningful.

The completion of this research was a journey full of mixed feelings and struggles combined with being worried, nervous, excited, challenged, inspired, exhausted, resistant, engaged, intimidated, proud, confident, encouraged, and relieved. It was perceived as seeing the light near the end of the tunnel at the same time viewed as shedding the light for the future. The same metaphor could be applied to conducting the research in validating the Rorschach. The positive results supported by this study was parallel with the symbolic meaning representing seeing the lights near the end of the tunnel in finally documented the evidence in supporting the validity of the Rorschach. At the same time, the unexpected negative results found through this research process also symbolically shedding the light for the future Rorschach researches. In congruent with the structure of the interpersonal circumplex, the completion of this research is an end and also a beginning of a professional development that could be conceptualized as the “intrapersonal” circumplex, ranging from being intimidated in initiating the project in the beginning, transiting into shying away from carrying out the study, shifting to actively implement and execute the experiment, and ending with writing the results with love and passion. As a researcher carrying out the external process of attempting to complete the validation of the Rorschach through the interpersonal circumplex, a parallel internal process of validating this researcher’s professional development through the
“intrapersonal circumplex” was also experienced. The mutual and reciprocal interactions between validating this researcher’s professional development through intrapersonal circumplex and validating the Rorschach’s validity through interpersonal circumplex framework were the greatest reward and insight that were fully unexpected and unfolded during the process of completing this project.
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List of Abbreviations

*Rorschach Abbreviations*
AGC RP .................. Aggressive Content Response Phase
AGC ....................... Aggressive Content
AGCM RP ................ AGC RP + AGM RP
AGCMmCOP ............ AGC RP+ AGM RP – COP RP
AGM RP .................. Aggressive Movement Response Phase
AGM ...................... Aggressive Movement
CCI% RP .................. Critical Content Index Percent Response Phase
CCI% ....................... Critical Content Index Percent
Colorful .................. Colorful Content
ColorLoc .................. Color as a location
COP RP .................. Cooperative Movement Response Phase
COP ...................... Cooperative Movement
CS ......................... Comprehensive System
MA ......................... Mutuality of Autonomy Scale
MAH RP .................. Mutuality of Autonomy-Health Response Phase
MAH ....................... Mutuality of Autonomy-Health
MAP RP .................. Mutuality of Autonomy-Pathology Response Phase
MAP ....................... Mutuality of Autonomy-Pathology
MOR RP .................. Morbid Content Response Phase
MOR ...................... Morbid Content
PCC ....................... Pleasant and Colorful Content
Pleasant .................. Pleasant Content
ROD ....................... Rorschach Oral Dependency Scale
R-PAS ..................... Rorschach Performance Assessment System
SumC ..................... Color as a determinant

*Non-Rorschach Abbreviations*
CRT-A .................. Conditional Reasoning Test of Aggression
IAT ....................... Implicit Association Test
ICC ....................... Intraclass Correlation
IPQ ....................... Interpersonal Questionnaire
PFQ ....................... Post Film Questionnaire
SC-IAT .................. Single Category Implicit Association Test
Chapter One

Introduction

Background of the Study: The Rorschach as a Psychological Measurement Tool

The origins of the Rorschach Inkblot task can be traced to an inkblot-based parlor game called *Klecksographie*, which was popular in Europe during the early 20th century. Herman Rorschach, who was an enthusiast for this game, believed that a visual attribution task like this would be able to help him differentiate patients with various types of mental disorders from each other as well as from psychologically healthy people (Exner, 2003; Weiner & Green, 2007). Rorschach then experimentally constructed a large number of inkblots, and out of those, he carefully selected and iteratively refined a subset of these on which to conduct research and test his theories. In 1921, Rorschach published a monograph titled *Psychodiagnostics*, which reported findings based on his administration of a final set of 10 inkblots to samples of 288 mental hospital patients and 117 nonpatients, where the inkblots were administered with the following standard instruction: “What might this be?” Rorschach held the belief that, after viewing the inkblots, respondents’ answers to the question of “What might this be?” would reveal the respondents’ unique individual perception, their reality testing processes, and their problem-solving capacity (Exner & Erdberg, 2005). Since then, Rorschach’s name and the 10 inkblots he created have become fixtures in the field of personality assessment.

The Rorschach Inkblot task has been considered one of the most unique psychological measurement tools created in the past nine decades. By using the Rorschach, examiners have been able to understand individuals by gathering three types of data: (a) structural information by considering the Rorschach as a perceptual task to
help identify personality states and traits, (b) content themes by considering the Rorschach as an associational task to help recognize an individual’s underlying needs and attitudes, and (c) a representative sample of behavior patterns by considering the Rorschach as a behavior performance task to help observe an individual’s orientation to problem-solving and interpersonal situations (Weiner, 2003, 2005; Weiner & Green, 2007). As indicated by Meyer, Viglione, Mihura, Erard, and Erdberg (2011), the contemporary perspective on this personality measurement tool has defined the Rorschach as a task that

……allows the examiner to observe and assess the behavioral performance of the respondent - to see what the person does, not what the person says he does. This performance assessment provides a demonstration of the respondent’s solutions to the challenging visual, cognitive, and perceptual problems in the blot stimuli – what we call observing “the personality in action.” (p.1)

During the past 90 years, the Rorschach has been widely used by psychologists in multiple settings. According to the most recent national surveys of psychological test usage, the Rorschach was listed as one of the most frequently used tests by clinical psychologists (rank order of 4th) and neuropsychologists (rank order of 18th) (Camara, Nathan, & Puente, 2000). In addition to its application in clinical settings, the Rorschach has also been popular in forensic settings. Hilsenroth and Stricker (2004) used the Rorschach as an exemplar to illustrate five key issues and myths that forensic psychologists typically encounter when using psychological assessment instruments in forensic settings. They are (a) the need to obtain essential reference materials, (b)
controversy does not equal inadmissibility, (c) expertise resides in the psychologist and not in the assessment instrument, (d) legal debate is not “scientific” or unbiased, and (e) the need to examine appropriate qualifications of expertise when offering legal testimony. Hilsenroth and Stricker pointed out that such issues and myths not only are relevant in the use of the Rorschach, but are also equally applicable to the use of other psychological tests in forensic settings as well. Archer, Buffington-Vollum, Stredny, and Handel (2006) conducted a survey of forensic psychologists to determine which psychological tests have been used most frequently among psychologists in forensic settings. The results indicated that the Rorschach, which the researchers categorized as an unstructured personality test in the survey, has been the most commonly used unstructured test implemented in adult forensic evaluations.

**Statement of the Problem**

Even though the Rorschach has been commonly used in a wide range of settings, the debate about whether the Rorschach can be used as a valid personality assessment measure also has continued for decades (Bornstein & Masling, 2005). Although the 10 Rorschach inkblots have remained the same as the original ones used by Herman Rorschach, the systems for scoring and interpreting it have evolved and diversified across time from Rorschach’s original design. Prior to 1970, there were five major scoring and interpretation systems used in the U.S., as well as several additional minor scoring and interpretation indices (Exner, 1969, 2003; Weiner, 2003; Bornstein & Masling, 2005). The five major scoring and interpretation systems were developed by Samuel J. Beck, Marguerite Hertz, Bruno Klopfer, Zygmunt Piotrowski, and David Rapaport (Exner, 1969, 2003). Early debates regarding the Rorschach centered around the question of
inadequate research design and data analysis in validating the scoring variables (Cronbach, 1949; Exner, 2003; Wood, Nezworski, Lilienfeld, & Garb, 2003). Clinicians also struggled to decide which scoring and interpretation system was the most appropriate to use in their clinical work and which would provide the most accurate and helpful conceptualizations for their clients. After conducting a comparative analysis of the five major scoring systems, three surveys, and a systematic review of published Rorschach research, Exner published the first version of the Comprehensive System (CS) in 1974. His intention was to integrate the five primary scoring systems and to provide an empirically supported method of data analysis for the Rorschach. Since the publication of the CS, some researchers and clinicians have considered the CS to be the most appropriate and effective way to use the Rorschach inkblots and have considered the CS to be equivalent to or synonymous with the Rorschach method itself (Bornstein & Masling, 2005). However, the most recent debates have focused on the psychometric properties of the CS and extend to the legitimate usage of the Rorschach as a personality measurement tool.

**Arguments against using the Rorschach.** Several researchers have strongly criticized the validity of the CS (Garb, Wood, Nezworski, Grove, & Stejskal, 2001; Wood & Lilienfeld, 1999; Wood, Lilienfeld, Nezworski, & Garb, 2001; Wood, Nezworski, Lilienfeld, & Garb, 2003) and have even called for a moratorium on using the Rorschach in clinical and forensic settings (Garb, 1999). Nezworski and Wood (1995) initiated this line of debate with the publication of their research findings indicating that reflection responses and the Egocentricity Index in the CS were unrelated to self-focus and narcissism. Exner (1995) replied, stating that Nezworski and Wood’s conclusions
were based on the faulty assumption that reflection responses and the Egocentricity Index in the CS were designed to measure narcissism directly. While acknowledging Nezworski and Wood’s statement calling attention to unpublished dissertations that may add important information concerning the Egocentricity Index, Exner also provided a thorough review of how these two scores were developed. In his comments to Nezworski and Wood, Exner concluded that “the work concerning the CS remains unfinished and has encouraged other researchers to clarify specific issues or improve on the development of the test in general. Unfortunately, this review [Nezworski and Wood’s] offers little in relation to that objective” (Exner, 1995, p205). In the subsequent year, Wood, Nezworski, and Stejkal (1996a, 1996b) raised more detailed questions challenging the psychometric properties of the CS including inadequate inter-rater reliabilities, questionable variable validities, and the inaccessibility of Exner’s unpublished studies for further examination. Their critique sparked multiple series of literature reviews and debates with more than 80 articles published across more than 10 journals.¹

With the accumulation of debates exchanged between 1995 to 2002, Wood et al. (2003) published a book entitled *What’s Wrong with the Rorschach? - Science Confronts*

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the Controversial Inkblot Test to assert their arguments against continuing using the Rorschach based on their critique of the CS. Wood et al. considered the Rorschach to be a failure as a personality measurement tool because of (a) inadequate CS norms, (b) its inefficiency in terms of time-consuming administration and unreliable scoring, (c) an inability to provide consistent and accurate psychological diagnoses, (d) a lack of incremental validity, and (e) an inability to control the total number of responses that a client may provide in response to the inkblots, which potentially influences other Rorschach scores. Garb, Wood, Lilienfeld, and Nezworski (2005) updated their arguments concerning two fundamental issues that were embedded in the Rorschach controversy: (a) inadequate norms and (b) a lack of validated scores. Despite advice from Exner (1995) to clarify specific problematic issues and to improve the development of the test in general, these researchers continued to recommend suspending use of the Rorschach in clinical and forensic settings.

Evidence supporting the use of the Rorschach. In responding to the challenges regarding to the psychometric properties of the CS raised by Wood et al. (1996a), Exner (1996) provided explanations regarding the issue of inter-rater reliability, provided clarification about what he considered distorted perspectives related to validity, and clarified what he considered misleading conclusions about the integrity of the empirical research focused on exploring and validating the CS. Wood et al. (1996b) replied to Exner’s commentary with consistent assertions that Exner’s CS could not be used as “a reliable and valid instrument for assessing personality and psychopathology” (p17). Such claims prompted several Rorschach researchers to conduct extensive and thorough reviews to examine the arguments provided by Wood et al. (1996a, 1996b). The reviews
focused on the Rorschach’s inter-rater reliability, validity, and research foundations supporting the CS.

In terms of the inter-rater reliability, Meyer (1997a) pointed out that Wood et al.’s (1996a, 1996b) “criticisms of CS reliability are unwarranted and quite misleading” (p.488). First, Meyer (1997a) noted that Wood et al.’s suggestions to only report inter-rater reliability at the protocol level would be misguided because inter-rater agreement at the response level would be more stringent and accurately evaluate the application of coding guidelines. Secondly, Meyer (1997a) explained the advantages and limitations of selecting one statistical method (percentage correct) over the other (Cohen’s kappa) to examine CS inter-rater reliability. He pointed out that such a selection is important to understand because Cohen’s kappa may not be readily interpretable for low-base-rate variables. Third, Meyer (1997a) noted that Wood et al.’s (1996a, 1996b) belief that protocol-level reliability was not inherently more reliable than response-level reliability actually goes against the general principle of aggregation within the statistical literature. Fourth, Meyer (1997a) pointed out that Wood et al. (1996a, 1996b) ignored other well-documented studies on CS reliability, such as test-retest reliability studies that require adequate inter-rater reliability in order to obtain adequate test-retest reliability results. Finally, Meyer (1997a) documented based on a systematic review of 16 studies reporting CS interrater reliability that coding reliability was excellent, with an average estimated kappa = .86. As suggested by Meyer (1997b), inter-rater reliability mainly assesses potential scoring errors, which are reduced substantially through proper reliability training (Meyer et al., 2002).
In order to provide additional evidence about how to appropriately compute inter-rater reliability and advance CS scoring, researchers had conducted two studies with the intention to provide guidelines to resolve this issue (McDowell & Acklin, 1996; Acklin, McDowell, Verschell, & Chan, 2000). The results showed that calculating inter-rater agreement at the protocol-level produces higher inter-rater agreement coefficients, which provided a further support for Meyer’s (1997a, 1997b) position. At the same time, the results also indicated that kappa and the intraclass correlation coefficient would be better statistics to assess CS inter-rater reliability issues, which also indicated that Wood et al.’s (1996a, 1996b) critique warranted attention (Archer, 1999; Meyer, 1999a).

Concerning Rorschach CS validity issues, Weiner (1996) pointed out that test validity should focus on the correlation between the psychological assessment instruments and the predicted observable behavior rather than the correlation between two different psychological assessment instruments. Thus, there is a possibility that two different psychological assessment instruments, such as the Minnesota Multiphasic Personality Inventory (MMPI/MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) and the Rorschach, might show equivalent correlations with the predicted observed behaviors, but each of the instruments could show low correlations with each other (Weiner 1996, 2001; Meyer 1996, 1997c, 1999b; Meyer & Archer, 2001). Such an observation corresponds to the conclusion made by Parker, Hanson, and Hunsely (1988) based on their meta-analytic studies of the Rorschach. According to Parker et al. (1988), “The MMPI and Rorschach are both valid, stable, and reliable under certain circumstances when either test is used in the manner for which it was designed and validated” (p. 373). Empirical studies also have supported the notion that self-report
instruments and the Rorschach are qualitatively different in terms of their ability to measure different constructs of personality (explicit vs. implicit and self-knowledge attribution vs. behavior performance) from multiple perspectives (Meyer & Archer, 2001; Stricker & Gold, 1999; Viglione, 1999; Weiner, 1999, 2001; Viglione & Hilsenroth; 2001). Viglione (1999) systematically reviewed 138 empirical, quantitative research studies published from 1977 to 1997 in five important peer-reviewed journals, including Assessment, Journal of Clinical Psychology, Journal of Consulting and Clinical Psychology, Journal of Personality Assessment, and Psychological Assessment. Based on the evidence in this review, Viglione concluded that the Rorschach can be viewed as a behavioral problem-solving instrument that is particularly useful when applied to individualizing case conceptualizations and interventions as well as predicting and evaluating treatment outcome. Weiner (1999) also provided two case illustrations demonstrating that when two examinees responded to the MMPI with similar defensive response styles that led to a similar pattern of invalid MMPI profiles, the two examinees revealed quite different CS profiles. Thus, the results from the Rorschach provided an idiosyncratic personality profile of each examinee that enabled clinicians to enhance their comprehensive understanding of each individual. Such demonstrations of using the Rorschach and other measurements together as part of a personality assessment battery were consistent with the scientific methods used in other settings (e.g., conducting neuropsychological testing, conducting medical examinations), that also applied the cross-method principle to fully comprehend the observed phenomena (Meyer et al., 2001).
Additional meta-analyses comparing the validity of the Rorschach and MMPI also demonstrated that on average both tests had equal validity but the MMPI’s validity coefficients were larger than the Rorschach’s when used for psychiatric diagnoses and when other self-report measures were used as criterion variables, whereas the Rorschach’s validity coefficients were larger than the MMPI’s when objective measures were used as criterion variables (Hiller, Rosenthal, Bornstein, Berry, & Brunell-Neuleib, 1999; Rosenthal, Hiller, Bornstein, Berry, & Brunell-Neuleib, 2001). A thorough review of global and focused meta-analyses has demonstrated that the Rorschach has average effect size magnitudes similar to the MMPI and the Wechsler Adult Intelligence Scale (WAIS) (Meyer & Archer, 2001).

Based on the accumulation of evidence emerging from the debates exchanged between 1995 and 2003, the board of trustees of the Society for Personality Assessment (SPA, 2005) published an official statement along with a summary of scientific evidence to emphasize the legitimate usage of the Rorschach in clinical and forensic practice. In addition, the controversy evaluating whether the Rorschach is a valid or invalid instrument had focused on Exner’s CS, equating it with the only way to use the Rorschach. However, this neglects other alternative validated Rorschach scoring systems. Thus, criticism of CS validity was extended to also characterize and call into question the validity of all scores that can be obtained from the Rorschach. To rectify this, Bornstein and Masling (2005) published *Scoring the Rorschach: Seven Validated Systems*. They detailed the seven best-validated non-CS scores to provide additional evidence supporting the continuing use of the Rorschach as a valid personality measurement tool.
Summary. By reviewing and responding to the vigorous debates exchanged between 1995 and 2005, some researchers have expressed their legitimate concerns about the psychometric properties of the Rorschach CS and provided their rationale for urging clinicians to discontinue the use of the Rorschach (Garb, 1999; Garb et al., 2001; Wood et al., 2003; Garb et al., 2005). On the contrary, other researchers have documented that the Rorschach has equivalent average global validity when compared to the MMPI and WAIS (Hiller et al., 1999; Meyer & Archer, 2001; Parker et al., 1988). That is, when findings from the literature are summarized and averaged, the average validity coefficients are similar. This does not mean, however, that each measure is equally valid for all purposes. The Rorschach is more valid when identifying psychotic diagnoses than depressive diagnoses (Meyer & Archer, 2001), the MMPI performs better at differentiating psychiatric patients from controls than predicting prison misconduct, and IQ tests are better at discriminating patients with dementia from controls than predicting pilot success (Meyer & Archer, 2001). Overall, the Rorschach has its unique clinical utility in personality assessment (Meyer & Archer, 2001; Stricker & Gold, 1999; Viglione, 1999; Weiner, 1996, 1999, 2001; Viglione & Hilsenroth; 2001). In the process of reviewing the Rorschach’s validity and its unique clinical utilities, researchers also have confirmed that the Rorschach has both conceptual and empirical limitations and identified guidelines for future research directions (Meyer & Archer, 2001; Meyer & Viglione, 2008). These guidelines for improving the validity and utility of the Rorschach have been divided into six main areas: (1) clarifying of the Rorschach’s locus of effectiveness, (2) updating normative data, (3) examining the reliability and adequacy of test administration, (4) adding studies regarding temporal stability, (5) researching
understudied variables, and (6) continuing to study issues of incremental validity and clinical utility (Exner 2003; Meyer & Archer, 2001; Meyer & Viglione, 2008). In the same way that other psychological measurement tools have been studied, such as the MMPI and WAIS, these six guidelines have provided a blueprint for advancing research on the Rorschach to improve its clinical usage.

Within the past two decades, several research projects have advanced the utility of the Rorschach based on these six guidelines. These research projects include but have not been limited to (a) the publication of international normative reference samples for the Rorschach Comprehensive System (Shaffer, Erdberg, & Meyer, 2007), (b) a survey focused on applied clinical validity of the Rorschach based on the feedback from clinicians’ clinical experience using the Rorschach (Meyer, Hsiao, Viglione, Mihura, & Abraham, 2012), (c) a thorough and comprehensive set of reviews and meta-analyses of the literature investigating the validity of each CS variable (Mihura, Meyer, Dumitrascu & Bombel, 2013; Mihura, Meyer, Bombel & Dumitrascu, 2015), and (d) the development of an advanced and refined Rorschach scoring system that draws on valid CS and non-CS variables: Rorschach Performance Assessment System (R-PAS; Meyer, Viglione, Mihura, Erard, & Erdberg, 2011).

In addition, a preliminary study focused on documenting and clarifying the Rorschach’s locus of effectiveness based on the research guidelines mentioned above has been conducted (Hsiao, Meyer, Mihura; 2011, 2012). This work focused on clarifying the Rorschach’s ability to capture consciously recognized as well as implicitly experienced psychological states. Stated differently, research on the Rorschach’s locus of effectiveness aims to document the extent to which test responses might be sensitive
and responsive to environmental contingencies that facilitate certain kinds of cognitive and affective states. Using an experimental design and implementing a cognitive-affective priming procedure, Hsiao et al. (2011, 2012) administered the Rorschach to participants immediately after inducing hostile-dominant and sad-compassionate mental states by asking participants to watch two different film clips. The results suggested that most of the R-PAS-based interpersonally related Thematic Codes and Critical Content codes selected for analysis were sensitive to and capable of capturing the induced psychological states as expected, which provided further support for the validity of the Rorschach.

Although the initial step of clarifying the Rorschach’s locus of effectiveness has been established by Hsiao et al. (2011, 2012), several limitations were listed, and recommendations were provided for further study. First, the results indicated that participants showed quite different reactions when responding to the film clip that was intended to induce the hostile-dominant emotion. Such variance may have been indirectly moderated by the participants’ individual personality characteristics. Secondly, the results could have been further strengthened by adding additional indirect measurements to serve as supplemental criterion measurements. One recommendation that resulted from Hsiao et al.’s study is that the same methodology be applied to validate other content-related Rorschach variables.

**Purpose of the Study**

The purpose of this study is to determine whether the validity of the Rorschach can be further refined by addressing the limitations and recommendations from Hsiao et al.’s study (2011, 2012). Specifically, this study focuses on three main areas. First,
through the inclusion of additional measurements prior to the experimental manipulation of cognitive-affective priming, this researcher will be able to better monitor participants’ pre-experiment psychological states or personality characteristics. Current research has indicated that, when under experimental mood manipulation conditions, baseline traits can produce additive or interactive effects to influence emotion-congruent memory and judgment (Rusting, 1998, 1999). For instance, a person who endorses high scores on a negative trait (e.g. neuroticism) is prone to stronger negative memories and judgments during a negative mood state than a neutral or positive mood state. Vice versa, an individual who endorsed high scores on a positive trait (e.g. extraversion) tends to retrieve more positive memories and make more positive judgments during a positive mood state than a neutral or negative state. Therefore, it is important to monitor baseline psychological states and personality characteristics to determine if they play a role in affecting the participants’ response to the cognitive-affective priming. Secondly, additional contemporary implicit measurements will also be administered after the cognitive-affective priming along with the Rorschach. The opportunity to secure additional measurements will be helpful in determining whether the Rorschach is in line with other performance-based measurements designed to detect the same effects after cognitive-affective priming. The ability to make this determination will further document the validity of the experimental paradigm. Third, rather than inducing feelings of compassion over loss, a video clip representing the intimacy-nurturant quadrant of the interpersonal circumplex has been selected to induce a corresponding experiential state of communion and love in this study. The addition of this video clip will provide more specific direction for exploring whether the Rorschach is also sensitive to capturing the
positive interactions that align with interpersonal circumplex-based personality theory. Such positive personality characteristics have been neglected in past studies on the Rorschach.

**Significance of the Study**

Current studies focused on validating the Rorschach variables typically have been limited by the methodological issues, theory framework issues, and other issue related to selecting the appropriate criteria across other subfields of psychology (Bornstein, 2011; Exner, 2003; McGrath, 2008; Meyer & Archer, 2001; Meyer & Viglione, 2008). The significance of this study encompasses four major domains: (a) reviewing the most updated concepts of validity and applying those concepts to investigate the Rorschach’s validity; (b) establishing an experimental paradigm, including experimental stimuli, experimental manipulation procedures, and Rorschach group administration procedures, that can be applied in multiple settings to facilitate studying the validity of Rorschach content-related variables; (c) integrating selected Rorschach Thematic and Content codes with the interpersonal theory via the interpersonal circumplex; and (d) merging Rorschach assessment with the contemporary development of other indirect measures from different psychological subfields, such as social cognition (Implicit Association Test) and industrial-organizational psychology (Conditional Reasoning Test for Aggression).

**Organization of the Study**

This research study is presented in five chapters. Chapter 1 includes the background of the study and reviews the history of the Rorschach as a personality measurement tool. It includes the statement of the problem and presents the
controversies that have appeared in the research literature debating the merits and
drawbacks of using the Rorschach as a psychological measurement instrument in clinical
and forensic settings. It also reviews recent research projects that have been undertaken
to advance the utility of the Rorschach following the six guidelines that emerged as a
result of the controversies. The purposes of the study are also included in this chapter as
well as the significance of the study.

Chapter 2 presents an in-depth review of the research literatures and offers
potential resolutions to the limitations identified in other Rorschach validation studies,
including addressing methodological issues, theory framework issues, and appropriate
criteria selection issues. At the end of the literature review, a brief summary is provided
followed by the research hypotheses that have been formulated based on the review of the
research literature. Chapter 3 describes the methodology used for this research study. It
describes the selection of participants, instruments, data collection procedures, and data
analysis procedures. Chapter 4 presents the actual results from the data analyses
including demographic information, testing the research hypotheses and additional
analyses. Chapter 5 provides a summary of the study, discussion of the findings,
implications of the results, recommendations for future research, and conclusions.
Chapter Two

Literature Review

Introduction

Chapter 2 presents a review of the research literature regarding methodological issues, theoretical framework issues, and appropriate criterion selection issues. The review of literature regarding methodological issues includes several subsections: (1) the evolution of the concept of validity; (2) traditional and contemporary perspectives on the concept of validity and measurement validation approaches; (3) challenges to the current mainstream validity concepts and measurement validation approaches; and (4) the most recently proposed research paradigm, the process-focused model, for validating Rorschach variables. The review of literature on the theoretical framework issues focuses on interpersonal circumplex theory, which has been broadly applied in self-report personality measurements but has not been systematically applied to the Rorschach yet. This review explores the application of interpersonal circumplex theory as a framework for studying Rorschach variables. The review of literature on appropriate criterion selection issues includes a discussion of (1) the mood induction procedure to study emotion by using films, (2) the studies using films to assess emotion via performance-based measurement, (3) the definition of the Rorschach as a performance-based personality measurement, and (4) the selection of the indirect and performance-based measures of attitudes and cognitions across other subfields of psychology. This section also introduces two measurements as appropriate criteria for this study: the Implicit Association Test (IAT; Greenwald & Banaji, 1995; Greenwald, McGhee, & Schwartz, 1998) and the Conditional Reasoning Test of Aggression (CRT-A; James, 1998, James &
McIntyre, 2000). This brief introduction to Chapter 2 provides a rationale that demonstrates how the review of literature leads to the formulation of the research hypothesis and predicted results.

**Literature Review on Methodological Issues**

**The evolution of the concept of validity.** Although Wood et al. (2003) and Garb et al. (2005) have criticized the Rorschach’s lack of validity, the concept of validity itself has not been without controversy either. In Sireci’s (2009) historical review of the concept of validity, he has reported that the definition of validity and proposed validation approaches have evolved over time. The changes in the definition of the concept of validity have been a reflection of the evolving validity nomenclature. For example, the nomenclature first described “four categories” of validity (APA, 1952; i.e. predictive, status, content, congruent), which were then renamed as the “four types” of validity (APA, 1954; i.e. construct, concurrent, predictive, content). Eventually, these four types of validity were reduced to “three types” of validity (APA, 1966; i.e. criterion-related, construct-related, content-related), renamed as the “three aspects” of validity (APA, AERA, & NCME, 1974; i.e. criterion-related, construct-related, content-related), eventually renamed again as the “three categories” of validity (AERA, APA, & NCME, 1985; i.e. criterion-related, construct-related, content-related). Most recently, these three categories of validity were redefined, extended, and named the “five sources of evidence” (AERA, APA, & NCME, 1999; i.e. content, response processes, internal structure, relations to other variables, consequences of testing). Along with changes in the definition of the concept of validity, the proposed validation approaches also have evolved. In particular, they have evolved from the criterion-related correlational
approach (Bingham, 1937; Guilford, 1946; Kelly, 1927) to the factor analytic approach
(Cattell, 1943; Guilford, 1946; Spearman, 1904; Thurstone, 1932) to the multitrait-
multimethod matrix approach (Campbell & Fiske, 1959; Cronbach & Meehl, 1955) to the
unitary conceptualization approach (Messick, 1989) to the most recent argument-based
approach (Kane, 1992) and the newly proposed process-focused model approach

Traditional perspectives on the concept of validity and measurement validation approaches. According to Kane (2001) and Sireci (2009), between 1920 and 1950, the concept of “validity” had been loosely defined, and measurement validation approaches had focused primarily on correlating test scores with some criterion scores. For example, Guilford (1946) defined validity by saying “a test is valid for anything with which it correlates” (p.429), and Cureton (1951) defined validity as “how well a test does the job it is employed to do” (p.621). The earliest article that formally addressed validity concepts related to psychological testing was “Technical recommendations for psychological tests and diagnostic techniques: Preliminary proposal” (APA Committee on Test Standards, 1952). One of the specific guidelines within this document focused on clarifying and defining the concept of validity:

…Four categories of validities have been distinguished; namely, predictive validity, status validity, content validity, and congruent validity…Predictive validity denotes correlation between the test and subsequent criterion measures….Status validity denotes correlation between the test and concurrent external criteria….Content validity refers to the case in which the specific type of behavior called for in the test is
the goal of training or some similar activity…. Congruent validity is established when the investigator demonstrates what psychological attribute a test measures by showing correspondence between scores on the test, and other indicators of the state or attribute. (p.467)

In particular, the APA Committee on Test Standards (1952) devoted a relatively large amount of space to illustrating congruent validity and stated that “this type of validation is used for tests intended to measure a construct arising from some theory” (p.468). Examples of how to establish congruent validity were also given, including relying on:

…correlation with other tests, on observations of persons having known scores, and on evidence that the test discriminates between groups (as in status validity)…. Of the most importance, however, is a direct experimental attack. Controlled investigations can test the deduction from theory” (p.468).

As indicated by the APA Committee on Test Standards, one of the purposes of publishing this preliminary proposal was to seek critical examinations by and suggestions from APA members and others who were concerned with and interested in assessment instruments. After reviewing the criticisms and suggestions, an official revised version of Technical Recommendations for Psychological Tests and Diagnostic Techniques was prepared and published in 1954 by a joint committee of the American Psychological Association, American Educational Research Association, and National Council on Measurements Used in Education. Several guidelines regarding validity in this official version are worth mentioning.
First, the “four categories” of validity were redefined as the “four types” of validity. More specifically, “status validity” was renamed “concurrent validity,” and “congruent validity” was renamed “construct validity.” Secondly, construct validity was first introduced and defined with the intention of investigating which psychological qualities a test measures. In other words, construct validity mainly focused on validating the theory underlying the instrument. Construct validity is ordinarily studied when the researchers have no definitive criterion measure of the quality with which they are concerned and must use indirect measures to validate the theory that the test is measuring its intended quality. The validation process requires two steps. The first step is forming a theory regarding what variance of scores may represent—that is, the variance in psychological qualities that is observed among individuals. The second step is gathering the data and predicting the variance in the scores. Successfully predicting the variance of scores would then indirectly confirm the variance of psychological qualities that were hypothesized. Such validation processes can be carried out through several approaches, including (a) a traditional, although slightly complicated, direct examination procedure by designing an experiment to test out a hypothesis, (b) a simpler, less time consuming, but indirect examination procedure of correlating one test with other tests that measure a similar construct, or (c) a factor analysis. Third, the guidelines in the validity section emphasized that “it must be kept in mind that these four aspects of validity are not all discrete and that a complete presentation about a test may involve information about all types of validity” (APA, 1954, p.16). Nonetheless, the guidelines also indicated that content validity is important in the case of ability, achievement, or proficiency measures; predictive validity is essential in the case of interest inventories in predicting the
educational or vocational plans of a client; concurrent validity is crucial in the case of personality questionnaires for screening and diagnostic purposes; and construct validity is vital in the case of projective techniques and related clinical methods or when a personality questionnaire is designed to test a personality theory. The latter is especially true because it can be hard to find any single declarative behavioral criterion for the constructs represented by a score from a performance technique like the Rorschach and related clinical methods, as well as for personality theories more generally (APA, 1954).

To further explain the innovation of construct validity, Cronbach and Meehl (1955) published their seminal article as supplementary material. This material was focused on explaining construct validity more clearly and elaborating on its implications for psychological tests. Cronbach and Meehl’s explanation of construct validity was initially formulated as an attempt to propose recommendations that would apply to what were historically referred to as projective techniques. They defined a construct as “some postulated attribute of people, assumed to be reflected in test performance. In test validation, the attribute about which we make statements in interpreting a test is a construct” (p283). They listed five methods that can be applied to investigate construct validity: (1) group differences, (2) correlation matrices and factor analysis, (3) studies of internal structure (i.e. internal consistency), (4) studies of change over occasions (e.g., retest reliability), and (5) the direct observation of a person’s process of performance and its relation to the variability on a test. Cronbach and Meehl stated that the logic of construct validation is based on the fundamental principles of the nomological network: “The laws in a nomological network may relate (a) observable properties to each other; or (b) theoretical constructs to observables; or (c) different theoretical constructs to one
another” (p.290). Cronbach and Meehl further concluded that by employing the five methods of investigating construct validity with the interpretation of the results based on the nomological network principles,

…the construct is at best adopted, but never to be ‘correct.’ We do not first ‘prove’ the theory, and then validate the test, nor conversely…. We examine the relation between the total network of theory and observations. The system involves propositions relating test to construct, construct to other constructs, and finally relating some of these constructs to observables. (p.294)

Cronbach and Meehl’s illustration and clarification of the concept of construct validity not only broadened the scope of validity literature, but it also laid out the theoretical foundation for further development of measurement validation approaches. Within the five methods of establishing construct validity, correlation matrices were less clear at the time when the concept of validity was introduced. Campbell and Fiske (1959) introduced and further developed the multitrait-multimethod matrix to examine convergent and discriminant validity as alternative approaches to validating a measurement. By the end of the 1950s, the mainstream validation paradigms had shifted from simple correlation and factor analysis into a systematic examination of the relationships between multiple measurements. The focus of measurement validation has emphasized exploring the nomological network underlying an instrument and forming a theory of measurement to confirm the nomological network.

**Contemporary perspectives on the concept of validity and measurement validation approaches.** Cronbach and Meehl’s (1954) definition of construct validity
and Campbell and Fiske’s (1959) multitrait-multimethod matrix validation approaches dominated the validity literature for about 40 years. The Standards for Educational and Psychological Tests and Manuals, published in 1966 (APA); the Standards for Educational and Psychological Tests, published in 1974 (AERA, APA, & NCME); and the Standards for Educational and Psychological Testing, published in 1985 (AERA, APA, & NCME), maintained the definition of validity under three “types,” “aspects,” or “categories”: criterion-related validity (including predictive validity and concurrent validity), construct-related validity (such as convergent validity and discriminant validity), and content-related validity. With an increasing numbers of intensive and accumulative studies focused on improving the concept of construct validity proposed by Cronbach and Meehl, another paradigm shift gradually emerged and became explicit in a more recent publication of the Standards for Educational and Psychological Testing (AERA, APA, & NCME, 1999). This paradigm shift reflected not only the continuing effort to maintain the general principles that are inherent in the nomological network to validate a measurement, but it also represented a shift away from emphasizing the validation of the theory of a measurement and more toward the validation of the adequacy and appropriateness of the interpretation of the test scores. This contemporary paradigm also has been called a unitary conceptualization approach and takes into account the social consequence of the testing— that is, the meaning interpreted from the test scores (Borsboom, 2004; Kane, 2001; Messick, 1988, 1989; Sireci, 2009). The concept of validity was listed in the first section of the Standards for Educational and Psychological Testing and was defined in the first sentence of the validity section: “Validity refers to the degree to which evidence and theory support the interpretations of
test scores entailed by proposed uses of tests” (AERA et al., 1999, p.9). Attempts to
distinguish different types of validity were no longer the focus. Instead, the sources from
which to draw the validity evidence and the validation process itself became the center of
attention. The sources of validity evidence include (a) evidence based on test content, (b)
evidence based on response processes, (c) evidence based on internal structure, (d)
evidence based on relationship to other variables, and (e) evidence based the
consequences of testing (AERA et al., 1999). This paradigm shift can be conceptualized
as examining measurement based on its function rather than its structure.

Messick’s (1975, 1980, 1988, 1989) work within the validity literature provided
the primary contributions that supported the shift to the contemporary validation
paradigm. Messick (1975, 1980) focused on balancing the tension between (1) the ideal
principles that were proposed by Cronbach and Meehl (1955) for validating tests using
different types of validity coefficients and (2) the real-world practice employed by
clinicians or practitioners using different measurements to help them make decisions
about diagnosis, level of functioning, or evaluating job performance. He first pointed out
that the decision-making process about how and when to use which kind of test for what
kind of specific purposes was worth equal attention in understanding what constitutes the
measurement itself. Similarly, the interpretation process of determining the meaning to
be assigned to the obtained test scores was also worth as much attention as the judgment
about where to evaluate and how to perceive the obtained test scores. Thus, Messick
viewed the concept of validity from a unified perspective and proposed that the
appropriateness, the meaningfulness, and the usefulness of score-based inferences are
actually inseparable from the measurement validation process (Messick, 1988).
Extending the concept of validity by considering both the purpose of the test and its interpretation and broadening the validation sources by an appraisal of both evidence and consequence, Messick (1980, 1988, 1989) formulated his unified validity framework. When test interpretation is justified from the appraisal of evidence, it represents construct validity. When test use is justified from the appraisal of evidence, it represents both construct validity and its applied utility. When test interpretation is justified from the appraisal of consequence, it represents value implications. When test use is justified from the appraisal of consequence, it represents the social consequence of the assessment.

Instead of viewing validity as the underlying attributes that are reflected on a test, this contemporary perspective views validity as how well the test developers or users select the appropriate measurements and explain the meaning of the test to match particular purposes based on the sources of evidence and theory. It is interesting that, under this contemporary perspective of validity, the test or the test score was assumed to be a neutral entity. What researchers and theorists were validating is the process used to interpret this neutral entity, including whether adequate decisions are made about linking the test scores with the represented meaning and, if yes, whether appropriate inferences can be drawn between the test score and the represented meaning. With this concept in mind, validity was no longer considered as a separate entity representing different structures or components of a test, but rather it was considered to be an evaluation of how well researchers, theorists, and clinicians have supported the function of the test to be used for particular purposes.

Kane (1992) proposed an argument-based approach based on Messick’s (1980, 1988, 1989) framework and illustrated the strategies that focused on making test
interpretation justifiable from an appraisal of the evidence. That is, using an argument-based approach to determine construct validity became scientifically-based and manageable. The basic principle was that the validator starts by building an argument aimed at defending the use of a test for a particular purpose. Such an argument must be based on empirical evidence and support the proposed use of the test. This approach involved (a) determining the inferences to be derived based on test scores, (b) generating the hypotheses, (c) deciding on the sources of evidence that would support or refute those hypotheses, (d) gathering the appropriate data, and (e) analyzing the evidence (Kane, 1992; Sireci, 2009). Kane acknowledged that validity can only be “approached” rather than “proved” as long as the validator can present sufficient evidence to justify the interpretations that were made.

Challenges to the current mainstream validity concepts and measurement validation approaches. After APA’s (1954) publication of Technical Recommendations for Psychological Tests and Diagnostic Techniques and Cronbach and Meehl’s (1955) publication of “Construct Validity in Psychological Tests,” psychologists quickly adopted construct validity as a mainstream concept. With the publication of Campbell and Fiske’s (1959) “Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix,” psychologists soon adapted this validation approach as the primary methodology of validating their measurements in conjunction with factor analysis. However, challenges to the mainstream concept of validity did not stop at this moment. Bechtoldt (1959) published the first critique of the adoption of construct validity as the mainstream method of conceptualizing validity and pointed out several “dangers” associated with this approach. He distinguished two different philosophical systems that led to different
perspectives on the concept of validity: operationalism and representationalism. Bechtold based his critique of construct validity on operationalism (also referred to as logical positivism, logical empiricism, logical behaviorism, or neobehaviorism), which is different from Cronbach and Meehl’s rationale in establishing their view of construct validity based on representationalism (also referred to as indirect realism, or phenomenalism). Bechtoldt argued that APA (1958) provided a clear definition, stating that “psychological tests are nothing more than careful observations of actual performance under standard conditions” (p.218). Based on this definition, the concept of validity and the focus of test validation processes should be on “careful observations of actual performance under standard condition” (p.218). Such emphasis can be applied to every psychologist’s daily activities across multiple settings, including the laboratory, the clinic, the school, and various industrial settings. Recent challenges to the most current conceptualizations of validity and measurement validation approaches also have suggested that the examination of observed performance should be the focal point of these discussions (Borsboom, 2005; Borsboom, 2006; Borsboom, Cramer, Kievitt, Scholten, & Franic, 2009; Borsboom, Mellenbergh, & Heerden, 2004).

As recognized by Borsboom et al. (2004), the mainstream concept of validity has become more complicated and diverged from the kind of commonsense understanding of validity that most people would hold. Cronbach and Meehl (1955) formulated their concept of validity based on whether the empirical relationships between test scores matched theoretical relationships under a nomological network. Messick (1980, 1988, 1989) formulated his definition of validity by considering the function of the testing and its sources of justification to determine whether the interpretation and use of the obtained
test scores can be justified through the sources of evidence and consequences. Borsboom et al. (2004) proposed that validity should be a very basic concept and that this concept had been correctly formulated by Kelley in 1927, when he stated that “a test is valid if it measures what it is purported to measure” (p.14). Therefore, the most common and logical question to ask about validity is whether a test measures what it was designed and intended to measure. This view of validity provided a simple, clear, and direct definition that matched a commonsense understanding of validity and was referred to as “test validity” (Borsboom et al., 2009, p.138). To further support their arguments and challenge the current mainstream view of validity, Borsboom et al. (2009) analyzed and illustrated the drawbacks of conceptualizing validity through operationalism (not every phenomena can be easily operationally defined, such as IQ, personality traits, and emotions) and the limitations of conceptualizing validity through representationalism (the degree of reference links are too theoretical, abstract, and complicated). Borsboom et al. (2009) then proposed an alternative way to reconcile these two philosophical systems, which was to view validity through the philosophical system of direct realism:

Realism, in the context of measurement, simply says that a measurement instrument for an attribute has the property that it is sensitive to differences in the attribute; that is, when the attribute differs over objects then the measurement procedure gives a different outcome. This implies that there must be a causal chain that describes the working of the measurement procedure, in which the measured attribute plays a role in determining what the outcomes of the measurement procedure are. (p.148)
Under this perspective, “test validity” was based on the following principles: (a) the attribute that the test intends to measure should be assumed to exist, (b) the variations in the attribute causally produce variations in the outcomes of the measurement procedure (i.e., changes in test scores), (c) the test scores should be viewed as a property of a test and should be viewed as equivalent to the assumed attribute, (d) rather than assuming that construct validity is a function of evidence, test validity should be viewed as a function of truth, and (e) as opposed to current validation approaches, what needs to be tested is not the theory about the relationship between the attribute and other attributes, but a theory of response behavior (i.e., examining the causal relationship between item administration and item response) (Borsboom, 2005; Borsboom, 2006; Borsboom et al., 2004; Borsboom et al., 2009). Although this concept of test validity and its proposed measurement validation through experimental manipulation have not been well integrated into the current mainstream of validity studies in the published literature, the arguments made by Borsboom et al. (2004) and Borsboom et al. (2009) have caused theorists and researchers to rethink and improve the current understanding of validity as well as develop alternative validation approaches.

**The process-focused model for validating test variables.** Bornstein (2011, 2012) recently proposed a process-focused (PF) model as an integrated validation approach to resolve the current debates within the validity literature. The PF model was illustrated from the accumulated pool of validation studies using the Rorschach Oral Dependency Scale (ROD, Masling, Rabie, & Blondheim, 1967) across multiple methodologies, which included experimental designs as well as correlational designs (Bornstein, 2002, 2007). One of the major advantages of the PF model is that it validates
test scores by encompassing the traditional and contemporary validity perspectives, such as Embretson (1983), Messick (1995), and Kane (1992), as well as the recent challenges to these perspectives, such as Borsboom et al. (2004), and Borsboom et al. (2009). Bornstein (2011) indicated that implementing the traditional outcome-focused approach to validate test variables generates outcome validity coefficients and implementing the process-focused approach to validate test variables generates process validity coefficients. Bornstein (2011, 2012) has noted that the PF model shifts attention about validity concepts from focusing on outcome validity coefficients to focusing on process validity coefficients. The PF model also shifts test validation approaches from verifying the correlation between measurements to confirming the causal relationship between the latent variables and observable outcomes. Bornstein (2011) illustrated these principles with the following:

[T]he PF model conceptualizes validity as the degree to which respondents can be shown to engage in a predictable set of psychological processes during assessment, with those processes dictated a priori by the nature of the instrument(s) used, and context in which testing takes place. The PF model differs from traditional validity assessment not only with respect to how validity is conceptualized but also with respect to empirical emphasis: In contrast to the traditional approach wherein correlational methods are used to quantify the relationship between test score and criterion, the PF model uses experimental methods to manipulate variables that moderate test score-criterion relationships, enable researchers to draw more definitive conclusions regarding the impact of underlying processes (e.g.,
autobiographical memory search in response to a self-report questionnaire item) and moderating variables (e.g., motivation, mood state) on test scores. (p. 532)

Two major components in the PF model were presented: instrument-based processes and context-based influences (Bornstein, 2011). Instrument-based processes take into account the nature of the measurements themselves and classify the measurements into six categories: (1) self-attribution measurements (e.g., NEO Personality Inventory), (2) stimulus-attribution measurements (e.g., Rorschach), (3) performance based measurements (e.g., Wechsler Adult Intelligence Scale), (4) constructive measurements (e.g., Draw-a-Person Test), (5) observational measurements (e.g., Behavior Trace Analysis), and (6) informant report measurements (e.g., Shedler-Westen Assessment Procedure, SWAP-200). Context-based influences refer to the situational factors that can be potentially manipulated and cause changes in particular psychological attributes during the testing process. Such influences can be classified according to the following four categories: (1) assessment setting (e.g. conducting an assessment in a forensic setting may induce a defensive mode while conducting an assessment in an educational setting may induce a confirmation mode), (2) instructional set (e.g., giving different instructions as an experimental intervention such as describing the positive effect of having a neurotic trait to one group and describing the negative effect of having a neurotic trait to another group), (3) affect state (e.g., inducing a sad or happy affect state through different types of mood induction procedures), and (4) examiner effects (e.g., interacting with participants supportively or distantly). By considering these two components (instrument-based processes and context-based
influences), Bornstein (2011) established four steps for validating test scores: (1) deconstructing the assessment instrument(s) by specifying the underlying psychological process and identifying the context variables that alter these processes; (2) operationalizing and evaluating the process-outcome links by (a) manipulating the alterable context-based influence variables, (b) generating the hypothesized outcome, and (c) designing and conducting the experiment that evaluates the predicted result; (3) interpreting the outcome based on the processes that were altered, as well as recognizing any limitation of the experimental conditions; (4) evaluating the ecological validity of the results and applying the findings across different populations, contexts, and settings.

Validating measurements using the PF model can generate process validity coefficients, which can provide supplemental validation information to complement traditional outcome validity coefficients (Bornstein, 2011). Integrating these two separate validation coefficients can provide a comprehensive view of a measure’s validity. If a measurement is documented with both adequate outcome and process validity coefficients, we can confidently conclude that the measurement has robust validity. If a measurement is documented as having adequate outcome validity but not process validity, we know that it measured what it was intended to measure, but we have not identified the underlying mechanism that causally influences the observed scores. If a measurement is documented as having adequate process validity, but not outcome validity, we know that it causally measures what we expect it to measure, but the results do not match with the theoretical “nomological network” that was assumed to be present among other observable variables. If a measurement is documented as having both inadequate outcome and process validities, we have reason to believe it is invalid. Given
the controversies and conflicting research results that have been raised in the past two decades regarding the validity and utility of the Rorschach, Bornstein (2012) advocated that the PF model in particular is an ideal validation paradigm for studying Rorschach scores. If the PF model can successfully establish the validity of Rorschach variables, this model also can be generalized to other measurements in the personality assessment field.

**Literature Review on Theoretical Framework Issues**

**Circumplex models.** Across various studies that have been conducted in different fields of psychology, circumplex models are one of the theoretical frameworks that have been widely utilized in multiple domains. The circumplex model was first introduced by Guttman (1954) in the field of psychometrics. It stipulates that the qualities to be measured are represented in a two dimensional space within which variables do not cluster together but instead are spaced along the circumference of a circle, making any two 90-degree axes equally good representations of that space. The circumplex model was later adopted by Timothy Leary (1957) as a vehicle for operationalizing Sullivan’s interpersonal theory concepts in the field of personality psychology. About the same time, it was also implemented by Plutchik (1958) to describe relationships among eight basic bipolar emotions in the study of emotions. The circumplex model has been applied to multiple areas within the field of clinical psychology. For example, it has been used to conceptualize personality disorders (Widiger & Hagemoser, 1997), understand interpersonal problems (Horowitz, Dryer, & Krasnoperova, 1997), evaluate therapeutic process and outcome (Henry, 1997), and appraise marital and family systems (Olson, Russel, & Sprenkle, 1983). In addition, the circumplex model has also been used to
identify vocational interests and conduct color perception studies (Tracey, 2000). The review of theoretical framework issues in this section begins with a brief review of the innovation of the circumplex model in the field of psychometrics. Next, this section focuses on the application of circumplex models in the two main fields of psychology related to this study: personality and emotion. As proposed by Plutchik (1997), the circumplex model is then presented as a unified theoretical framework (as it should be) for studying personality and emotions. Finally, the rationale for validating Rorschach variables using the interpersonal circumplex framework is provided.

**The innovation of the circumplex model in psychometrics.** According to Lorr (1997) and Tracey (2000), Guttman’s (1954) publication of a psychometric article entitled “A New Approach to Factor Analysis: The Radex” was considered the first iteration of the circumplex model. Guttman developed his radex theory while studying intelligence and intelligence testing. He recognized that the content of different mental tests may vary across at least two facets (which are not dimensions or factors, but ideas or concepts). One facet is differences in the kind of items presented (e.g., visual, verbal); the second facet is the degree of complexity or difficulty required to complete the item. When differences in the kind of task completed is held constant and differences in the degree of complexity or difficulty is varied, it is called a simplex and all items will be positively correlated. When differences in kind are varied but differences in degree of complexity are held consistent, the radex facet is called a circumplex and items will vary in their characteristic pattern of correlation with each other. When there are simultaneous differences both in the kind of items that contribute to a circumplex and in the degree of difficulty to complete the items, the full radex is present. To establish a circumplex,
however, a set of qualitatively different items or traits is placed in a given domain that has an order without beginning or end (Guttman, 1954). That is, the traits or items array themselves in a 2-dimensional circular pattern. Thus, in a circumplex, the differences in the set of traits are assumed to be surrounding two major dimensions (e.g., north-south and east-west) with a constant radius. The geometric locations of the different traits on the circumplex represent the correlation structure among traits. That is, when two traits have higher correlations, their geometric locations on the circumplex will be close to each other. When two traits have lower correlations, their geometric location on the circumplex will be distant from each other. According to Tracey (2000), Guttman distinguished two different circumplex models: circulantal and quasi-circumplex. A circulantal circumplex represents an optimal situation in which each trait has equal spacing on the perimeter of the circumplex. However, in certain situations, each trait may not have equal spacing on the circumplex. When this occurs the structure is considered to be a quasi-circumplex. Regardless whether there is equal spacing among each trait on the circumplex, the general pattern of relationships represented in both types of circumplexes is similar in that they both provide a circular representation of two dimensional space (Tracey, 2000).

**Interpersonal theory and the interpersonal circumplex.** In the field of personality theory and personality assessment, Wiggins (2003) provided a thorough review of personality, measurement, and assessment across five major personality assessment paradigms: psychodynamic, interpersonal, personological, multivariate, and empirical. Among these five paradigms, the interpersonal paradigm was developed based on Harry Stack Sullivan’s (1953) interpersonal theory. Instead of focusing on innate
drives, Sullivan viewed personality as recurrent patterns of interpersonal relationships. He proposed that the desire to avoid anxiety due to loss of self-esteem and the desire for interpersonal security motivated people to form interpersonal relationships. In 1957, Timothy Leary had successfully operationalized Sullivan’s concepts within a two-dimensional interpersonal circumplex model anchored by dimensions of dominance and affiliation. Leary’s interpersonal circumplex model was then revised and refined by Wiggins (1980, 1982, 1985, 1995, 2003; Wiggins, Trapnell, & Phillips, 1988; Wiggins & Trobst, 1997, 1999). The name of the two-dimensional interpersonal circumplex was also changed from “dominance and affiliation” to “agency and communion.” Agency represents the manifestation of striving for mastery and power under the condition of being a differentiated individual. It enhances and protects that differentiation. The positive direction on the dimension of agency indicates power, mastery, assertion, and dominance. The negative direction on the dimension of agency indicates weakness, failure, unassertiveness, and submission. Communion represents the manifestation of striving for intimacy, union, and solidarity under the condition of being part of a larger social or spiritual entity. The positive direction on the dimension of communion indicates intimacy, union, solidarity, affiliation, compassion, and love. The negative direction on the dimension of communion indicates remoteness, hostility, disaffiliation, and hate (Wiggins, 1980, 1982, 1985, 1995, 2003; Wiggins, Trapnell, & Phillips, 1988; Wiggins & Trobst, 1997, 1999). Based on the theoretical framework that the interpersonal circumplex provided, Wiggins (1980, 1982, 1995; Wiggins, Trapnell, & Phillips, 1988) developed the Interpersonal Adjective Scale (IAS) to measure the interpersonal circumplex. The IAS has been documented as a well-designed circulant
circumplex that demonstrates approximately equal spacing among eight octants. These eight octants are generated based on the two major dimensions as mentioned above: agency and communion. The eight octants include (1) warm-agreeable, (2) unassuming-ingenious, (3) unassured-submissive, (4) aloof-introverted, (5) cold-hearted, (6) arrogant-calculating, (7) assured-dominant, and (8) gregarious-extraverted (see Figure 2.1). Other representative assessment instruments similar to the IAS include, but are not limited to, the Inventory of Interpersonal Problems (Horowitz, 1979, 1988), the Impact Message Inventory (Kiesler, 1979; Kiesler, Schmidt, & Wagner, 1997), and the Structural Analysis of Social Behavior (Benjamin, 1974).
Figure 2.1. Circumplex Structure of IAS Scales (Wiggins & Trobst, 1999).
The circumplex model in emotion. Application of the circumplex model is not only found in interpersonal theory, but it is also found in the study of emotions. In the field of emotion theory, Schlosberg (1941, 1952) published the earliest article indicating that six broad categories of emotions could be potentially presented in a circular fashion. The six broad categories of emotions are (1) love, happiness, and mirth; (2) surprise; (3) fear and suffering; (4) anger and determination; (5) disgust; and (6) contempt. However, Schlosberg noticed that his results, which emerged from using a scale for judging facial expressions, did not form a true circle (circular circumplex), but rather they formed an oval-shaped circle (quasi-circumplex). He displayed these six categories of broad emotions surrounding two main dimensions of facial expressions: pleasantness-unpleasantness and attention-rejection. Two years later, Schlosberg (1954) developed an activation theory of emotion by combining the contributions of both James-Lang’s (Lang, 1994) and Cannon-Bard’s (Cannon, 1927) theories of emotion. Schlosberg (1954) recognized that, regardless of the sequence within the emotion-generating process, physical arousal is considered one of the fundamental elements of emotion in both theories. Thus, he added a third dimension to his emotion circumplex and named this dimension “activation” to form a more comprehensive view of emotion. Plutchik (1958; 1962; 1980) proposed a similar three-dimension model of emotion and extended Schlosberg’s (1941, 1952, 1954) six categories of emotion to eight basic emotions that fall into four bipolar dimensions. The eight basic emotions within the four bipolar dimensions are (1) joy versus sadness, (2) anger versus fear, (3) trust versus disgust, and (4) surprise versus anticipation.
Russell (1980) continued this line of research and proposed a slightly different circular model of affect with supportive evidence that emerged from scaling 28 affect adjectives assessed through four different methodologies. He first hypothesized eight emotions that can be placed into a two-dimensional space on a circumplex. He specified these two dimensions as “pleasure-displeasure”, on the horizontal axis, and “arousal-sleep” on the vertical axis. The eight representative emotions are pleasure, contentment, sleepiness, depression, misery, distress, arousal, and excitement. Russell asked laypersons to complete different sorting tasks by either grouping the 28 affective adjectives into the eight representative emotion categories or placing the 28 affective adjectives on the two-dimensional space. Russell then used three of the four assessment methodologies to identify his proposed eight emotions. The three assessment methodologies include (1) using Ross’s (1938) scaling technique to determine the circular ordering of the emotion variables (see Figure 2.3), (2) identifying the perceived similarity among the terms with a multidimensional scaling procedure, and (3) examining the two-dimensional space of “pleasure-displeasure” and “arousal-sleep” with a unidimensional scaling procedure. Based on the supportive results confirming his proposed two-dimensional emotion circumplex, Russell’s fourth method involved analyzing the self-reports of 343 subjects’ affective states using a principal-component analysis. The results provided additional evidence that support Russell’s proposed circumplex model of affect.
Figure 2.2. Russell’s Circular Ordering of the 28 Affective Adjectives (Russell, 1980).
A unified model as a theoretical framework for personality and emotion.

Meyer and Shack (1989) conducted one of the studies exploring the convergence between mood and personality theories by using circumplex models. For the circumplex model on mood structure, Meyer and Shack examined Watson and Tellegen’s (1985) model of positive affect (PA) and negative affect (NA). Watson and Tellegen’s PA and NA circumplex model converges with Russell’s (1980) circular model of affect in a way that his dimensions of degree of arousal and pleasantness-unpleasantness are located at 45° rotations to the dimensions of Watson and Tellegen’s PA and NA (see Figure 2.4; Meyer and Shack, 1989). For the circumplex models on personality structure, Meyer and Shack examined Eysenck and Eysenck’s (1985) model of introversion-extraversion (E) and neuroticism-stability (N). By using factor analytic techniques, they found that Watson and Tellegen’s model of mood (PA and NA) was isomorphic with Eysenck and Eysenck’s model of personality (E and N), such that PA is the emotional core of E and NA is the emotional core of N. If the E and PA dimension is placed on the east-west pole on the circumplex and the N and NA dimension is placed on the north-south pole on the circumplex, then the rest of Wiggins’ interpersonal circumplex will fan out around the E/PA dimension to form the equator line on a 3-D globe (Meyer, personal communication, October, 10, 2012).
Figure 2.3. Convergence of Watson and Tellegen’s (1985) PA and NA and Russell’s (1980) Arousal and Pleasantness-Unpleasantness Dimensions on Emotional Circumplex (Meyer & Shack, 1989).
Another attempt to integrate the circumplex model as a theoretical framework for personality and emotion was done with Plutchik and Conte’s (1997) book entitled *Circumplex Models of Personality and Emotions*. In the beginning of his introductory chapter entitled “The Circumplex as a General Model of the Structure of Emotion and Personality,” Plutchik (1997) suggested that personality and emotions should be unified:

Although the domains of personality and emotions traditionally have been considered and taught as two distinct conceptual areas, there are several reasons for considering them as part of the same domain of interpersonal relations. (p.17)

Plutchik (1997) provided three primary reasons to support the convergence of personality and emotions. First, the language used to describe both personality traits and emotions is extensive and overlaps. For example, when a person is described as having a hostility trait, this person is usually perceived as possessing a certain degree of angry feelings. When a person shows a blended emotion consisting of both joy and happiness most of the time, this person is usually recognized as having an extroverted or gregarious personality trait. Secondly, from a psycho-evolutionary perspective, the functional significance of personality traits and the functional significance of emotions also experience a substantial overlap. On one hand, in Sullivan’s (1953) interpersonal theory, the concept of “personality” represents a recurrent pattern of how an individual deals with the anxiety of losing personal self-esteem and how an individual maintains a feeling of security within interpersonal relationships. Thus, the function of personality can be viewed as a way to strive toward individuation amidst surrounding interpersonal relationships. One the other hand, in emotion theory, emotions are viewed as species-
wide response that occur in response to external (or internal) environmental changes or threats and enable an organism to survive and facilitate reproductive success. Therefore, both personality and emotions serve similar functions that enable individuals to interact with and survive within their surroundings. Third, the theoretical frameworks for emotions and personality traits are both well described when conceptualized under the circumplex model. Wiggins’ (1980, 1982, 1985, 1995, 2003; Wiggins, Trapnell, & Phillips, 1988; Wiggins & Trobst, 1997, 1999) interpersonal circumplex model laid out two-dimensional personality characters as a result of interpersonal interactions. Furthermore, Plutchik’s three dimensional model of emotion (see Figure 2.2) also provides a conceptual convergence with Wiggin’s interpersonal circumplex, particularly for the octants of contempt, aggressiveness, optimism, love, and submission.

Plutchik (1997) pointed out that the interpersonal circumplex primarily describes the interpersonal aspects of personality. This does not mean that the interpersonal circumplex can apply easily to other aspects of personality, such as an individual’s physical characteristics, cognitive function, or cognitive style. The same truth also applies to the emotion theory. The circumplex of emotion represents only one aspect of the many ways that emotions can be conceptualized. Recognizing the limitation of this convergent view of personality and emotions is as equally important as identifying the strength of this point of view.

**Validating Rorschach variables under the interpersonal circumplex framework.** Because the circumplex model is best viewed as a unified model of personality and emotions, it is reasonable to utilize the interpersonal circumplex model as a guiding theoretical framework to study Rorschach variables, especially for those
variables that traditionally have been used to represent interpersonal characteristics (Bornstein, 2001; Meyer & Viglione, 2008). Based on the process-focused research paradigm for validating Rorschach variables (Bornstein, 2011, 2012), one way to validate the Rorschach is to induce thematic mental states that are related to aggression on the positive pole of the agency dimension and the negative pole of the communion dimension as well as love and warmth on the positive pole of the communion dimension and then administer the Rorschach right after these inductions. If the Rorschach is able to capture the carryover effects of the two particular mental states induced, this can establish the validity of the Rorschach as an implicit measure of personality, mood, and attitude.

**Literature Review on Appropriate Criterion Selection Issues**

**Using films as a mood induction procedure to study emotion.** In terms of experimental procedures, research on emotion has resulted in several experimental designs that successfully induced and assessed target mood states (Coan & Allen, 2007). The process of eliciting at least 11 emotions in the laboratory by using films has been well documented over decades and across different countries, including the United States (Gross & Levenson, 1995; Rottenberg, Ray, & Gross, 2007), Belgium (Philippot, 1993), Germany (Hagemann, Naumann, Maier, Becker, Lürken, & Bartussek, 1999), and Japan (Sato, Noguchi, & Yoshikawa, 2007). These emotions include sexual arousal, amusement, anger, confusion, disgust, embarrassment, fear, happiness, interest, sadness, and surprise. Among these studies, the results also indicated that there is a greater affective reactivity in women than in men both in self-report measurements and physiological data, such as shorter latencies of startle responses and more pronounced changes in facial muscle activity in females than in males during the presentation of films.
Studying film-induced emotion via performance-based measurements.

Previous studies have suggested that exposure to violence in media (either by visual or auditory stimuli) significantly increases the levels of violent content within inkblot responses. Using an adolescent sample, Hess, Hess, and Hess (1999) conducted two experiments to assess aggressive imagery levels using the Holtzman Inkblot Technique. In each experiment, the participants were exposed to either (a) a violent scene from *The Pet Sematary* (Rubinstein, Galin, & Stein, 1989) that featured a car wreck with a victim whose brain was exposed and whose blood was splattered about or (b) a bucolic scene from *Say Anything* (Platt, Marks, & Crowe, 1989), during which a male adolescent and a female adolescent were driving in the countryside on a pleasant day as one taught the other to drive with a standard transmission. Each scene was approximately three minutes long. In one experiment, the participants viewed the actual video clips; in the other experiment, participants listened to an audiotape of someone describing each scene. Using a within-subjects design, the results showed that brief exposure to the violent scene in either the visual or auditory mode generated an increase in aggressive inkblot responses.

A similar study used the Thematic Apperception Test (TAT; Murray, 1943) rather than the Rorschach to capture implicit cognitions after exposure to media (Rustad, Small, Jobes, Safer, & Peterson, 2003). When completing the TAT, participants generate stories in response to somewhat ambiguous pictures. Rustad et al. (2003) completed two experiments; in the first experiment, participants watched a rock music video that either
did or did not contain suicidal content; in the second experiment, participants listened to a rock song that either did or did not contain suicidal content. Subsequently, participants completed the TAT as well as several explicit measures of self-reported experience, including the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), the Self-Risk Assessment (Rothman, Klein, & Weinstein, 1996), and the Suicide Opinion Questionnaire (Domino, Moore, Westlake, & Gibson, 1982). The results indicated no significant differences in suicidal thoughts and attitude on the explicit measures for the experimental and control groups. However, the participants who heard or saw the suicide-related songs produced significantly more suicide-related themes in their TAT stories than did the participants in the control condition.

**The Rorschach as a performance-based personality assessment.** Historically, psychologists in the field of personality assessment have loosely classified personality measurements into two categories: (1) objective tests and (2) projective tests. Personality measurements that are classified within the objective tests category comprise the majority of self-report inventories and questionnaires commonly used today. Personality measurements that are typically classified within the projective category include, but are not limited to, the Rorschach Inkblot Test, the TAT, the Sentence Completion Test, the Draw-a-Person Test, the House-Tree-Person Test, and others. Meyer and Kurtz (2006) have pointed out that this classification system is actually inaccurate and misleading, and at worst, they describe one category (objective tests) in a more positive fashion than the other (projective tests). Considering the nature of the test-taking process, completing self-report inventories and questionnaires actually requires personal judgment, self-perception, self-knowledge, self-awareness, and other basic cognitive functioning. Such
processes indeed require self-reflection and can be influenced by personal dynamics and defenses. As such, they are not objective by the typical definition of the word. By the same token, responding to the images on the Rorschach Inkblot Test or TAT requires individuals to demonstrate their capacity to perceive the stimuli, their ability to process and integrate information, and solve problems. Ironically, such processes can indeed provide objective measures of an individual’s behavioral performance. As a result of the inability to make clear distinctions between objective and projective assessment, Meyer and Kurtz proposed an editorial guideline requesting that researchers and clinicians avoid using of the terms “objective” and “projective” when categorizing personality measurements. At the same time, Meyer and Kurtz also encouraged researchers and clinicians to propose more accurate descriptive terms and to replace the words “objective” and “projective” when describing personality testing.

In response to Meyer and Kurtz (2006), Bornstein (2007) proposed a framework for classifying personality tests by taking into account the nature of the psychological processes individuals undergo while taking the test. In contrast to the traditional dichotomous method of classifying personality measurements as either objective tests or projective tests, Bornstein’s classification is not limited to personality measurements but also encompasses a wide range of psychological measurements and consolidates them into six specific test categories: (1) self-attribution, (2) stimulus-attribution, (3) performance-based, (4) constructive, (5) observational, and (6) informant-report. According to Bornstein, the majority of self-report inventories and questionnaires can be classified within the “self-attribution” category, while the Rorschach and TAT are both classified within the “stimulus-attribution” category. Based on Bornstein’s system, the
Wechsler Adult Intelligence Scale and the Bender Visual-Motor Gestalt Test are classified within the category of “performance-based” measurements, while the Draw-a-Person Test and the Qualitative and Structural Dimensions of Object Relations are representative tests within the category of “constructive measurement.” Also in Bornstein’s system, the “observational” category is distinguished from the “informant-report” category. The Spot Sampling and the Behavior Trace Analysis are classified within the “observational” category, while the SWAP-200, a psychological assessment tool that is completed by clinicians to identify personality disorder diagnosis, and the Informant-Report version of the NEO Personality Inventory are classified within the “informant-report” category.

In contrast to Bornstein’s proposed process-focused classification system, Schultheiss (2007) proposed another classification system for personality measurements based on the research model of memory in cognitive psychology. According to Schultheiss, current research in memory has distinguished two types of memory: declarative memory and nondeclarative memory. Declarative memory refers to the ability to consciously recollect facts (semantic memory) and events (episodic memory). Nondeclarative memory refers to the ability to perform tasks that do not rely on conscious awareness. Nondeclarative memory includes the capacity to engage in procedural learning (e.g., acquisitions of habits and skills), classical conditioning (e.g., conditioned emotional responses related to specific stimuli), priming (e.g., the increased ability to detect and identify specific stimuli due to recent or extensive exposure to that specific stimuli), and nonassociative learning (e.g., sensitization and habituation). Schultheiss pointed out that the classification of memory system can also apply to
personality constructs and measurements. For example, in order to answer the questions on self-report personality inventories, individuals are required to consciously recollect the facts in their memories and evaluate the degree to which the question matches their recollection of the memorized facts. Thus, self-report personality inventories can be viewed as a declarative semantic personality measure. Similarly, a perceptual-cognitive test of personality, such as the Rorschach, is more likely to reflect nondeclarative memories that are associated with priming and classical conditioning and that are separate from conscious awareness. For instance, when individuals are presented a Rorschach card and are asked to make sense of the ambiguous information on the card, their responses are more likely to represent the automatically invoked cognitive and emotional schema that have been acquired through learning. Therefore, the Rorschach or TAT can be viewed as a nondeclarative priming or classical conditioning personality measurement. It is worth noting in this context Jacoby and Kelley’s (1987) widely cited distinction of memory as an object and memory as a tool. Memory as an object refers to reflective, conscious memory when events and experiences from the past are the object of scrutiny and subjectively recalled in the present. Memory as a tool refers to unaware memory when past experiences and events naturally and spontaneously inform efforts to accomplish a goal in the present. Completing a self-report scale relies on memory as an object; completing the Rorschach relies on memory as a tool. As advocated by Schultheiss, the best advantage of classifying personality measurement based on the memory-system it actuates is that this system provides an opportunity to bridge the gap between personality theory and assessment with other subfields of psychology. These
subfields of psychology include, but are not limited to, cognitive psychology, biopsychology, neuropsychology, and clinical psychology.

Although it was not a direct response to Meyer and Kurtz’s (2006) call for proposing an alternative classification system for personality measurements, McGrath (2008) suggested conceptualizing the Rorschach as a performance-based personality assessment and paralleled the Rorschach with other indirect measurements (e.g., the Implicit Association Test) that have emerged out of dual-process theory. McGrath pointed out that Kubiszyn et al. (2000) first introduced the term “performance-based personality test” to replace the term “projective test” as a label for non-self-report personality measurements, such as the Rorschach and TAT. According to Kubiszyn et al., there are two main reasons to use the term “performance-based personality test” as alternative nomenclature:

First, much like cognitive and neuropsychological tests, these tasks require patients to perform a defined activity with an examiner (i.e., generate a story or identify images). Second, evidence clearly indicates that these tests do not depend on or require a process of “projection,” as it has historically been defined (Exner, 1989). More often than not, the information obtained from these tasks reflects the patient’s perceptions, classifications, and cognitive-emotional templates or internal representations, rather than projections per se. (p. 120)

McGrath suggested that by using the term “performance-based personality test,” the distinction becomes clear between measurements of personality that involve behavioral sampling (e.g., the Rorschach or TAT) and measurements of personality that rely on the
endorsement of self-description by the respondent (e.g., the MMPI). In addition, when using the concept of “performance-based personality measurements” as an alternative classification system, it not only encompasses four out of six of Bornstein’s categories of instruments (“stimulus-attribution”, “performance-based”, “constructive”, and “observational”) but also parallels Schultheiss’s category of nondeclarative memory measures.

As indicated by McGrath, another advantage of considering the Rorschach in the context of performance-based personality measurement is that it provides connections between Rorschach research and research within other fields of psychology under the dual-process theory framework. In the dual-process theory, mental activities consist of two different components: mental processes and mental experiences. Mental processes typically have been referred to as unconscious, implicit, subliminal, or automatic mental operations. Mental experiences typically have been referred to as conscious, explicit, supraliminal, or deliberate mental presentations. Dual-process theory has been widely applied to almost all fields of psychology, including the study of attention and memory in cognitive psychology and neuropsychology (Barrett, Tugade, & Engle, 2004); the study of attitudes, personal perceptions, social perceptions, stereotype, and motivation in social psychology (Chaiken & Trope, 1999); and the study of affect and self-regulation in emotion (Bargh & Chartrand, 1999; Chaiken & Trope, 1999). In clinical psychology, the traditional psychoanalytic preference for studying unconscious rather than conscious mind parallels the dual-process preference for studying mental processes rather than mental experiences. When studying mental processes in cognitive, social, and emotion psychology, researchers have relied on performance-based measurements to tap into the
mental process domain. Examples include, but are not limited to, the Continuous Performance Test (Conners, 1994) in the literature on attention, various tests of the priming effect in the literature on memory (Perfect & Askew, 1994), and the Implicit Association Test (Greenwald & Banaji, 1995) in the literature on attitude. Thus, considering the Rorschach as a performance-based measurement that taps into the mental processes of personality is consistent with other fields of psychology. This perspective also provides a direction for exploring the appropriate criterion measurements for studying alongside the Rorschach.

The implicit and performance-based measures of attitudes and cognitions across other subfields of psychology. Implicit social cognitions have been defined as the unconscious and automatic thoughts that individuals have about their behavior, affect, cognition, needs, values, and attitudes (Greenwald & Banaji, 1995; LeBreton, Binning, & Adorno, 2006; Bing, LeBreton, Davison, Migetz, & James, 2007). During the last two decades, several methods have been developed for measuring implicit attitudes and cognitions in the fields of social psychology, cognitive psychology, and industrial psychology. Two of the most prominent implicit measurements are the Implicit Association Tests (IATs; Greenwald, McGhee, & Schwartz, 1998) and the Conditional Reasoning Tests (CRTs; James, 1998; James & McIntyre, 2000)

The Implicit Association Test (IAT). In order to study individual differences in implicit social cognition, Greenwald at the University of Washington and Banaji at Yale University designed the IAT in the mid-1990s. They designed the IAT as an indirect measurement to advance research in the field of social psychology (Lane, Banaji, Nosek, & Greenwald, 2007). Based upon the research that has focused on implicit memory in
the field of cognitive psychology, Greenwald and Banaji (1995) reviewed the general findings in the research literature on implicit memory; extended the definition of implicit memory to include implicit social cognition; and applied the concept of implicit social cognition to study attitude, self-esteem, and stereotypes. As indicated by Payne and Gawronski (2010), implicit memory has been defined as “influences of past experience on later performance, in the absence of conscious memory of the earlier experience” (p.4). Greenwald and Banaji assumed that the definition of implicit memory could be applied to explain implicit social behavior in certain contexts. According Greenwald and Banaji, “Considerable evidence now supports the view that social behavior often operates in an implicit or unconscious fashion. The identifying feature of implicit cognition is that past experience influences judgment in a fashion not introspectively known by the actor” (p.4). Developed based on the concept of implicit social cognition, the first publication of the IAT was announced in 1998 (Greenwald, McGhee, & Schwartz, 1998). In the past decade, more than 200 published research papers have reported applying the IAT as one component of the method used to study attitudes (e.g., concept-valence associations), stereotypes (e.g., group-trait associations), self-concept or identities (e.g., self-trait or self-group associations), and self-esteem (e.g., self-valence associations) (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). The IAT also has been used in the fields of clinical psychology, developmental psychology, marketing, health, law, scholarly research, and business (Lane et al., 2007). A series of papers devoted to clarifying the understanding of the IAT and promoting its use also has been published. These papers have focused on (1) an improved scoring algorithm (Greenwald, Nosek, & Banaji, 2003), (2) method variables and construct validity (Nosek, Greenwald, & Banaji, 2005), (3) a
meta-analysis of predictive validity (Greenwald, Poehlman, Uhlmann, & Banaji, 2009), and (4) the current understanding of the IAT (Lane et al., 2007). The review of the IAT literature in this section begins with a description of the structure of the IAT and continues with a rationale for interpreting the IAT results. Next, the current status of the reliability and validity of the IAT is presented. Research studies using the IAT to measure induced aggressive concepts are then reviewed to support the rationale for using the IAT as an appropriate criterion measure for the experiential manipulation in this research proposal.

Regarding the design of the IAT, Lane et al. (2007) and Teige-Mocigemba, Klauer, and Sherman (2010) provided a thorough review of the structure of the IAT and each of its components. The structure of the standard IAT, introduced by Greenwald et al. (1998), includes seven blocks. The first block contains 20 stimuli within two categories, and these stimuli are typically designed as the target discrimination task. Participants are shown the 20 stimuli, one at a time, on a computer screen. These 20 stimuli could be either words or pictures that are related to the category of “flower” or “insect.” Participants are asked to quickly sort the presented stimulus by pressing a designated computer key on the left side of the keyboard if the presented stimulus belongs in the “flower” category, and pressing another designated computer key on the right side of the keyboard if the presented stimulus belongs in the “insect” category. The second block contains another 20 stimuli within another two categories, and these stimuli are typically designed as the attribute discrimination task. Participants are again shown the 20 stimuli, one at a time, on a computer screen. These 20 stimuli could be either words or pictures that participants sort into either a “good” or a “bad” category.
Participants are asked to quickly sort the presented stimulus by pressing the same designated computer key on the left side of the keyboard if the presented stimulus belongs in the “good” category, and by pressing another same designated computer key on the right side of the keyboard if the presented stimulus belongs in the “bad” category. The third block is designed as the initial combined task in which participants are asked to press the designated computer key on the left side of the keyboard when any stimulus appears on the screen that belongs in the category of “flower” or “good” (i.e., flower + good pairing → left key), and press the designated computer key on the right side of the keyboard when any stimulus appears on the screen that belongs in the category of “insect” or “bad” (i.e., insect + bad pairing → right key). The number of sorting trials in the third block is usually the same as in the previous two blocks (i.e., a total of 20 stimuli in the third block). The fourth block is designed as another initial combined task and requires participants to repeat the procedure in third block; however, in the fourth block, the number of trials is increased from 20 to 40. The fifth block is designed as a reversed attribute discrimination task in which participants are asked to press the designated computer key on the left side of the keyboard if the presented stimulus belongs in the “bad” category and press the designated computer key on the right side of the keyboard if the presented stimulus belongs in the “good” category. In the fifth block, the original IAT design proposed by Greenwald et al. (1998) suggested having 20 trials. However, Nosek et al. (2005) have recommended increasing the number of trials in the fifth block from the original design of 20 to 40 as an effective means of improving measurement. The sixth and seventh blocks are designed as reversed combined tasks that are parallel to the third block and fourth block. The only difference on the sixth and seventh blocks
compared to the third and fourth blocks is that participants are asked to sort stimuli by pressing the designated computer key on the left side of the keyboard when any stimulus in the category “flower” or “bad” appears on the screen (i.e., flower + bad pairing → left key), and by pressing the designated computer on the right side of the keyboard when any stimulus in the category of “insect” or “good” appears on the screen (i.e., insect + good pairing → right key).

After participants have completed the sorting tasks in each of the seven blocks, researchers compare the combined response times on the third and fourth blocks (i.e., flower + good and insect + bad pairings) with the combined response times on the sixth and seventh blocks (i.e., flower + bad and insect + good pairings). It is assumed that individuals generally have positive attitudes toward flowers and negative attitudes toward insects. Thus, when the presented stimuli pairings are consistent with the participants’ implicit attitude (the third and fourth blocks), participants are expected to respond more rapidly on average than when the presented stimuli pairings are inconsistent with participants’ implicit attitude (the sixth and seventh blocks). In other words, when the presented stimuli pairings are consistent with the participants’ implicit attitude, participants demonstrate a relatively strong social cognitive association between positive attitudes toward flowers and negative attitudes toward insects. Such a strong social cognitive association is determined by the fact that participants spend less time responding rather than overtly reporting having positive attitudes toward flowers and negative attitudes toward insects. Therefore, the IAT is considered to be an indirect measurement that taps into the automatic, implicit, and unconscious mental processes associated with the participants’ attitude toward the target stimuli.
Research conducted during the past decade has indicated that the psychometric properties of the IAT (a) reflect reasonable internal consistency reliability (Cronbach’s alpha = 0.78), (b) but less satisfactory test-retest reliability (r ranges from 0.25 to 0.69), (c) although stability does not vary much depending on the length of the retest interval (Lane et al., 2007; Teige-Mocigemba et al., 2010). The validity of the IAT has been reported in several different formats. The nomological validity of the IAT has been supported by the theoretically predicted results that have emerged across studies. These studies have compared universal attitudes using what can be called the different-groups approach (e.g., the example of flower+good and insect+bad pairings) and the known-groups approach (e.g., attitudes toward stigmatized groups based on characteristics, such as race, sexuality, social class, religion, and nationality) (Lane et al., 2007; Teige-Mocigemba et al., 2010). Convergent validity research investigating the relationship between the IAT and other indirect (or implicit) measurements has reported mixed results (Lane et al., 2007) and weak correlations (Teige-Mocigemba et al., 2010). Discriminant validity research investigating the relationship between the IAT and other direct (or explicit) measures has also reported low to moderate correlations. However, there is still a considerable controversy about whether to interpret the low to moderate correlations between the IAT and direct (or explicit) measures as discriminant validity or convergent validity (Teige-Mocigemba et al., 2010). The predictive validity research investigating the IAT’s ability to predict behavior over and above direct (or explicit) measures has been reported as convincing and optimistic (Teige-Mocigemba et al., 2010). In particular, Greenwald et al. (2009) published a meta-analysis documenting that the IAT shows better predictive validity than direct (or explicit) measures of criterion behavior.
measurements when participants were asked to respond to socially sensitive domains, such as racial stereotyping and prejudice. Greenwald et al. (2009) have indicated that impression management may distort self-report responses in socially sensitive domains and lead to the impaired predictive validity of self-reports.

The application of the IAT as an indirect measurement to assess automatic thoughts related to aggressiveness was first suggested in a publication by Uhlmann and Swanson in 2004. Uhlman and Swanson used an experimental design in their study, and the intervention consisted of assigning participants to either an experimental group or a control group and then asking them to play different video games. Participants in the experimental group were asked to play a popular first-person violent video game. Participants in the control group were assigned to play a non-violent absorbing puzzle video game. Participants in each group played the video games for 10 minutes. Following the completion of the video game, participants then completed (a) the IAT (i.e., self + aggressive and other + peaceful pairings vs. self + peaceful and other + aggressive pairings), (b) three self-report aggressiveness measurements, and (c) a questionnaire about previous experiences and exposure to video games.

Uhlman and Swanson (2004) formed two main hypotheses for their study. First, they hypothesized that the short-term effects of exposure to the first-person violent video game would temporarily increase participants’ association between their self-concept and the concept of “aggression.” More specifically, they hypothesized that the response time in the self + aggressive and other + peaceful pairings would be shorter than the response time in the self + peaceful and other + aggressive pairings in the experimental group when compared to the control group. However, they also hypothesized that they would
not find significant differences between the experimental group and the control group on the self-report aggressiveness measurements. Secondly, Uhlman and Swanson hypothesized that the long-term effects of participants’ previous exposure to violent video games in their own lives would predict a stronger automatic association between their self-concept and their aggressiveness than participants’ self-reported aggressiveness. Thus, participants’ previous exposure to violent video games would predict participants’ degree of automatic aggressiveness and trait-like self-reported aggressiveness. In other words, the researchers hypothesized that participants who had spent more time playing violent video games through their lifetimes would show a higher degree of automatic aggressiveness on the IAT and trait-like self-reported aggressiveness. The results supported both hypotheses. Uhlman and Swanson concluded that their findings were consistent with the proposed general aggression model (Anderson & Bushman, 2002) – i.e., that the automatic associations between situations, emotions, attitudes, beliefs, and behaviors play a major role in human aggression.

Richetin, Richardson, and Mason (2010) used the IAT as an indirect measurement to assess the association between self-concepts and aggressiveness on two levels: (1) direct aggressiveness, which is defined as verbal or physical action intended to harm another living being in face-to-face confrontation, and (2) indirect aggressiveness, which is defined as verbal or physical action intended to harm another living being in a circuitous way, usually through another person or object. Richetin et al. (2010) intended to investigate whether individuals’ level of aggressiveness (measured by the direct aggressive IAT [DAG-IAT] and indirect aggressive IAT [IDAG-IAT]) can predict their aggressive behavior after being provoked through experimental intervention. In Richetin
et al.’s study, the first experimenter (a graduate research assistant) greeted the participants upon their arrival. The first experimenter then told each participant that he or she should perform a specific computer task, such that the participants were asked to complete both the DGA-IAT and the IDGA-IAT, and the presented order of these two IATs was counterbalanced. The first experimenter then left the room and asked the participant to call him when he or she had completed the task.

In the experimental group, when the first experimenter was called after participants had completed the IAT tasks, the first experimenter acted in a rude manner toward each participant by indicating that he or she did not finish the task quickly enough and that he or she had taken more time than anyone else to complete these tasks. The experimenter stated that the experiment was spoiled and that the data would be useless. The experimenter further expressed that he would need to find the next participant and restart the task. He would ask another experimenter to help him complete the rest of the experiment. The first experimenter then went out into the hallway and complained to a second experimenter about the participants’ slowness in a loud volume so that the participant could overhear the first experimenter’s criticism (i.e. in this way, participants were provoked by the first experimenter’s aggressiveness). The second experimenter then came in and took over the rest of the experiment. The second experimenter informed the participant that only a few assistantship positions were available and invited him or her to evaluate anonymously whether the first experimenter was qualified to continue receiving the assistantship position during the upcoming semester. Participants were told that their evaluation would be one of the major factors in the decision-making process. The evaluation included the participant’s opinion of the first experimenter’s
skills as a psychologist and as an experimenter (i.e., participants were given an opportunity to retaliate after being provoked by the first experimenter’s aggressiveness).

In the control group, after participants had completed the IAT tasks, the first experimenter acted in a neutral manner toward each participant by indicating that there would be a second experimenter coming in to help the first experimenter. Each participant overheard the first experimenter ask the second experimenter to help him complete the rest of the experiment. When the second experimenter came in, he expressed to the participants the same rationale relating to the shortage of assistantship positions and invited each participant to anonymously evaluate the first experimenter. Again, participants were asked to indicate their opinion about the first experimenter’s skills as a psychologist and as an experimenter.

Although the results of measuring indirect aggressiveness levels through the IDAG-IAT did not reach a statistically significant level (J. Richetin, personal communication, September, 28, 2012), the results suggested that both the DAG-IAT and IDAG-IAT demonstrated good reliabilities (α = .91 for the DAG-IAT; and .89 for the IDAG-IAT) and were highly correlated with each other (r = .55, p < .001). Thus, Richetin et al. (2010) combined both the DAG-IAT and IDAG-IAT into a single IAT score and used the IAT score to predict the participants’ aggressive behavior after being provoked. Richetin et al. concluded that implicit aggressiveness level as measured by IATs could successfully predict aggressive behavior only when the participants were in the context of provocation.

In summary, based on the results of studies conducted both by Uhlmann and Swanson (2004) and Richetin et al. (2010), using the IAT to study aggression as an
indirect measurement has been demonstrated and documented as successful. Thus, it is reasonable to select the IAT as one of the appropriate measures to help evaluate aggression implicitly in this study.

*The Conditional Reasoning Test of Aggression (CRT-A).* The CRT–A, an alternative and indirect measure of aggression, is designed to identify individuals’ implicit cognitive readiness to aggress (James 1998; James & McIntyre, 2000; Frost, Ko, & James, 2007; Bing, LeBreton, Davison, Migetz, & James, 2007). In broad terms, aggressive behavior varies from verbal, passive, and indirect covert acts to physical, active, and direct overt acts (Buss, 1961; James & McIntyre, 2000). The basic model of aggression posits individuals who possess aggressive dispositions tend to develop an implicit cognitive readiness to aggress, which leads to a high possibility of engaging in aggressive behavior (James 1998; James & McIntyre, 2000; Frost, et al., 2007). The CRT–A is categorized as an indirect measurement because examinees are informed that the test is intended to measure their critical reasoning skills, when in fact the test is intended to capture their implicit cognitive readiness to aggress. To identify the implicit cognitive readiness to aggress using the CRT–A, it is assumed that (a) aggressive individuals tend to believe that their behavior is reasonable and (b) they justify their aggressive behavior by employing cognitive reasoning biases (James 1998; James & McIntyre, 2000; Bing, et al., 2007; Frost et al., 2007). For instance, aggressive individuals tend to be observed by others as hostile, offensive, and malevolent. When they receive feedback from others, they often intend to respond to the feedback by engaging in a certain degree of aggressive behavior that ranges from passive verbal arguing to active physical fighting. Instead of perceiving themselves as acting out
aggressively, they justify their aggressive behaviors as a form of self-defense by biases in logical reasoning.

Current studies have documented the validity of the CRT–A and sanctioned its use in industrial-organizational settings (see details in James, 1998; James & McIntyre, 2000; James, McIntyre, Glisson, Bowler, & Mitchell, 2004; James, et al., 2005). LeBreton et al. (2007) further examined the function of the CRT–A as an indirect measure of implicit cognitions and whether results could be faked when the purposes of assessment were not disclosed. In this research, investigators examined the function of the CRT–A as an indirect measure based on three sub-studies. In study one, researchers compared the scores of the CRT–A using a between-subjects design that placed participants in either an “indirect” or “direct” condition. Those in the “indirect” condition, i.e., the control group, were administered the CRT–A in the original format. That is, the participants were informed that the test was a measure of inductive reasoning. Those in the “direct” condition, i.e., the experimental group, were told that the CRT–A was a measure of aggressive traits but that the instrument was designed to look like a logical reasoning test. Participants were requested to present themselves in an unfavorable manner. The results in study one indicated that when the CRT–A test was administered to those in the “direct” condition, participants in the experimental group were able to detect the keyed item responses and obtained higher aggression scores than participants in the control group who were administered the CRT–A test in the “indirect” condition. In study two, researchers compared the scores of the CRT–A using a within-subjects design. Subjects were instructed to complete the CRT–A and self-report surveys of socially desirable qualities at two different points in time separated by a one-week
interval using two different sets of instructions. One set of instruction asked participants
to complete the measurements under normal testing conditions, and the other set of
instruction asked participants to complete the measurements under an imaginary situation
in which the participants were applying for a job that they really wanted as a customer
service representative. It was hypothesized that participants in the imaginary situation
would obtain higher scores on the self-report surveys than participants in the normal
situation due to their preference for presenting themselves in a socially desirable manner.
It was hypothesized that because the measurement was indirect, the participants would
not perform differently on the CRT–A in these two situations due to their preference for
presenting themselves in a socially desirable manner. The results suggested that the
scores on the self-report surveys increased and shifted to reflect socially desirable
responses when participants were under the imaginary job application condition, but the
scores on the CRT–A revealed no significant difference between these two conditions.
The third study was conducted to evaluate the external validity of the CRT–A as an
indirect measure across three different samples: job incumbents, job applicants, and
students. The results revealed that there were no significant differences observed across
these samples. LeBreton et al. (2007) concluded that the CRT–A, when maintained as an
indirect measurement (normal testing situation), is not affected by the nature of the
sample, socially desirable responses, or faking. Thus, when participants are not told it is
an indirect measure of aggression, it is a useful and valid measurement system that is
appropriate for assessing implicit cognitions.

Frost et al. (2007) further investigated the channeling hypothesis of aggressive
behavior that was proposed by Winter, John, Stewart, Klohnen, and Duncan (1998) with
both self-reported aggression and implicit aggression measured on the CRT–A. According to Winter et al. (1998), self-beliefs about personality influence the channels through which people express their implicit motives. The combination of using explicit and implicit personality measurements provides a way to channel the expression of aggression. Frost et al. (2007) tested this integrated model for aggression. They administered the Anger Hostility Scale (AHS) from the NEO-PI-R (Costa & McCrae, 1992) as an indicator of self-beliefs about aggression, considering the scores on the CRT–A as an indicator of implicit aggression, and then observed the overt aggressive, passive aggressive, and oral aggressive behaviors among intramural basketball players. It was predicted that the players who were implicitly prepared to rationalize a desire to harm others (measured by the CRT–A) and viewed themselves as aggressive (measured by the AHS) would be observed engaging in significantly more overt aggressive behavior. It was also predicted that the players who were implicitly prepared to rationalize a desire to harm others (measured by the CRT–A) and viewed themselves as nonaggressive (measured by AHS) would be observed engaging in significantly more passive aggressive behavior. The results supported the channeling hypothesis and indicated that individuals who perceived themselves as aggressive explicitly and implicitly tended to engage in overt aggression. Individuals who did not perceive themselves as explicitly aggressive but were identified as having implicit aggressive tendencies tended to channel their implicit aggressiveness into passive aggressive behavior. Those individuals who perceived themselves as explicitly aggressive but were identified as lacking implicit aggressive tendencies tended to engage in verbal expressions of aggression. Frost et al. (2007) concluded that the CRT–A is a valid implicit measurement that provides an ability
to predict salient behavioral criteria. Thus, it is reasonable to select the CRT-A as one of the appropriate measures to help evaluate aggression implicitly in this study.

**Summary**

In this chapter, the literature review addressed methodological issues, theoretical framework issues, and appropriate criterion measure selection issues that typically have limited the validation process of Rorschach variables (Bornstein, 2011; Exner, 2003; McGrath, 2008; Meyer & Archer, 2001; Meyer & Viglione, 2008). Based on the literature review of methodological issues, Bornstein’s (2011, 2012) process-focused model has been proposed as an ideal validation paradigm for studying Rorschach variables. In terms of theoretical framework issues, the literature review has also documented that the circumplex model is best viewed as a unified model for studying personality and emotions. Particularly, Wiggins’ (1980, 1982, 1985, 1995, 2003; Wiggins, Trapnell, & Phillips, 1988; Wiggins & Trobst, 1997, 1999) interpersonal circumplex model has been recognized as the most reasonable theoretical framework with which to study the Rorschach variables that traditionally have been viewed as representing interpersonal characteristics (Bornstein, 2001; Meyer & Viglione, 2008). Finally, the review of literature on appropriate criterion selection issues has identified the validity of using performance-based measurements to study mindsets using films to induce mental states. Rationales for viewing the Rorschach as a performance-based and indirect measure have been provided. Two additional performance-based and indirect measures (the IAT and CRT-A) were reviewed and selected as additional measures for this study. Based on the results of the literature review, research questions and hypotheses for validating selected Rorschach Thematic and Content codes for this study
Main research questions and hypotheses. For the main research questions and hypotheses, this study will first examine whether the participants’ self-reported experiences after watching the film will match the cognitive-affective mindsets that this researcher expected to induce in each experimental condition. That is, will the selected films successfully induce a dominant and aggressive mindset as well as a communion and love mindset that are in line with the dimensions on the interpersonal circumplex? Second, this study will examine whether selected Rorschach variables will be able to capture any carryover effects following the film-based cognitive-affective priming procedures.

To further understanding how the impact of violence and aggression film and its induced mindsets may reflect differently on self-report and performance-based measurements, this researcher conducted another literature search in this area to facilitate forming more accurate hypotheses. Current literatures have examined four motivationally distinct types of angry aggression: (1) explosive/reactive, (2) thrill-seeking, (3) coercive, and (4) vengeful/ruminative (Bjørnebekk and Rick, 2012). Bjørnebekk and Rick specifically pointed out that although anger is traditionally seen as involving the experience of negative affect, an individual may recognize the experience of anger as a positive affect. This could be particularly true when an individual suspends the feelings of empathy for the victim as a precondition of experiencing the anger as a positive affect state. In Bjørnebekk and Rick’s study, the associations between these four types of angry aggression and observer reports as well as the relationship between these
four types of angry aggression and self-reported delinquency were examined. The results suggested that thrill-seeking angry aggression uniquely predicted all forms of self-reported delinquency, including destruction of property, violence, stealing, status offenses (e.g. lied about age to get something), minor offenses (e.g. tried stealing item worth 5 dollar or less), carried hidden weapon, and expelled from school. The results also confirmed that the quest for excitement is an important motivation for antisocial behavior in youth. This is consistent with the results of Hsiao et al.’s (2011, 2012) study. Participants assigned to the group that watched the violence and aggression film felt aroused and entertained (based on their self-report), while these participants demonstrated elevated scores indicative of violence, aggression, and harm on the Rorschach. Thus, to examine whether the participants’ personal self-reported experiences will reflect the affectively based experimental conditions that this researcher expected to induce in this study, this researcher expects to replicate Hsiao et al.’s (2011, 2012) findings on in the violent and aggressive film condition. The detailed research questions and hypotheses were formulated as follow (as summarized in Figure 2.5):

Research Question 1: Do the two film clips, one with a violence and aggression theme and the other with a communion and love theme, successfully induce the expected reactions in our participants?

Hypothesis 1: Participants will complete the self-report Post Film Questionnaire (PFQ, adapted and modified from Hsiao, Meyer, and Mihura [2011, 2012] for the current study) by recalling their emotional reactions while watching the film clips. A film clip depicting violence and aggression would be expected to elicit arousal and sensational seeking emotion that fall into the hostile and dominant quadrant on the interpersonal
circumplex. Thus, reports of high Joviality-Valence, Joviality-Arousal, and Self-Assurance scores on the PFQ are expected in the selected violent and aggressive film. A film clip depicting the themes of communion and love would be expected to elicit a mindset that fall into the positive end of the communion dimension on the interpersonal circumplex. Therefore, participants assigned to watch this film will report high Communion-Providing, Communion-Receiving scores on the PFQ. Further details of this communion variable are described in the “Measures” subsection of the Method section.

Research Question 2: Do implicit performance measures successfully capture the carryover effect of the film-induced mental state?

Hypothesis 2a: A mental state related to hostility and dominance will be induced by using a film clip depicting a bloody battle scene of violence and aggression. The following thematic codes in the R-PAS are expected to capture the carryover effects by showing elevations: (1) Aggressive Movement (AGM), (2) Aggressive Content (AGC), (3) Morbid Content (MOR), and (4) Mutuality of Autonomy-Pathology (MAP). In addition, the Critical Content Index is expected to capture the same carryover effects and show an elevation. Furthermore, the same carryover effect is also expected to be captured by IAT-Aggression.

Hypothesis 2b: A mental state related to communion and love will be induced by using a film clip depicting reciprocal emotional exchanges and mutually-enhancing interactions. This film clip is expected to induce a mindset of communion and love in the viewer. The following R-PAS Thematic codes are expected to capture these carryover effects and increase: (1) Cooperative Movement (COP) and (2) Mutuality of Autonomy-
Health (MAH). Furthermore, the same carryover effect is also expected to be captured by the IAT-Communion score.
Figure 2.4. Main Hypotheses: Expected Placement of Elevated PFQ Scores, Rorschach Codes, and IAT Results on the Interpersonal Circumplex after Experimental Manipulation by Watching Corresponding Films.
Supplemental research questions and hypotheses. If the main hypotheses are supported and the Rorschach’s validity for the Thematic Codes and Critical Content Index are established, this study will then examine whether the consistency between participants’ explicit self-representation and their implicit social cognition about aggression versus communion have additive effects in predicting participants’ reaction to the experimental situations as captured by the Rorschach variables. That is, will the participants who exhibit consistent explicit self-representation and implicit social cognition have a better capacity to process more deeply and carry forward the reactions to films that correspond to their self-concepts that will then be reflected on their Rorschach performance? In order to explore these areas, the following research questions were formulated (as summarized in Figure 2.6):

Research Question 3a: Do participants who explicitly and implicitly view themselves as hostile and dominant absorb the violence and aggression film better than others and thus more strongly reflect their hostile and dominant self-concepts in their Rorschach performance?

Hypothesis 3a: Participants who have high scores on both the IPQ Hostile-Dominance dimension (high explicit self-representation on aggression) and the CRT-A (high implicit social cognition on aggression) prior to watching the violence and aggression film will respond positively to this film better than others and will carry forward that response to the Rorschach task. Thus, they will have higher AGM, AGC, MOR, MAP scores as well as higher Critical Content Index scores after watching the violence film.
Research Question 3b: Do participants who explicitly and implicitly view themselves as caring and nurturing absorb the communion and love film better than others and thus more strongly reflect their caring and nurturing self-concepts in their Rorschach performance?

Hypothesis 3b: Participants who have high scores on the IPQ Communion-Love dimension (high explicit self-representation on communion) and low scores on the CRT-A (little or no implicit aggressive social cognition) prior to watching the communion and love film will respond positively to this film better than others and will carry forward that response to the Rorschach task. Thus, they will have higher COP and MAH scores on the Rorschach after watching the love film.
Figure 2.5. Supplemental Hypotheses: Expected Additive Effects of Baseline IPQ + CRT-A Scores with the Two Experimental Groups to Influence Rorschach Codes as Conceptualized Using the Interpersonal Circumplex.
Chapter Three

Method

Introduction

The primary goal of this study was to test the research questions and hypotheses generated from the literature review in Chapter 2, which aimed to validate the selected interpersonally related Rorschach Thematic and Critical Content codes through the mood induction procedure. The methodology designed to test the research questions and hypotheses is illustrated in this chapter. Chapter three is organized into six main sections: (a) introduction, (b) selection of participants, (c) measures, (d) procedure, (e) data analyses, and (f) summary. Section (a) provides the outline and the organization of this chapter. Section (b) explains how the number of participants needed for this study was determined through power analyses and describes the processes used to recruit these participants. Section (c) introduces the measures selected for this study to test the hypotheses, including the stimulus materials, one self-report implicit measurement, two self-report explicit measurements, and two performance-based measurements. Section (d) describes the procedures used to test the hypotheses. Section (e) describes how the collected data will be analyzed to test the main and supplementary analyses. Section (f) concludes this chapter with a brief summary.

Selection of Participants

To determine the needed sample size for this study, this researcher ran three different power analyses to decide the minimum number of participants that needed to be recruited. The first power analysis focused on estimating the minimum total sample size needed for an ANOVA with an expected medium effect size ($f = 0.25$) using a
significance level at 0.05 and power of 0.8. The results indicated that collecting a total sample size of one hundred twenty eight would be sufficient. The second power analysis focused on detecting the difference between two independent means. The results indicated that sixty-four participants in each condition would be required. The third power analysis focused on estimating the size of effect that could be detected if there was a sample size of fifty in the control group and a sample size of seventy in the experimental group. The results indicated that the expected effect size would be medium \((d = 0.52)\). Thus, it was decided that the minimal sample size for each experimental condition would be 70 and the minimal sample size for the neutral condition would be at least 50.

A total of 216 participants recruited from introductory psychology courses at the University of Toledo. Participants were randomly assigned to one of the three conditions: two experimental conditions and one control condition. Two criteria were used to determine whether the protocols were valid for final data analyses. First, according to the CRT-A test manual (James & McIntyre, 2000), when participants respond illogically to five or more questions the aggression score should be considered invalid. Thus, those protocols were excluded from final data analyses. Second, when participants did not provide information in both the Rorschach Response and Clarification Phases (e.g., a participant only gave information in the Response Phase, but did not offer any information in the Clarification Phase), those protocols were also considered invalid and excluded from final data analyses. For the two experimental conditions, 72 participants were randomly assigned to watch the violence and aggression film clip from the movie 300. Among the 72 participants, 69 of them provided valid
protocols for the final data analysis (three invalid CRT-A protocols). Another 75 participants were randomly assigned to watch the communion and love film clip from the movie *Braveheart*. Among the 75 participants, 72 of them provided valid protocols for the final data analysis (two invalid CRT-A protocols and one invalid Rorschach protocol). The rational of selecting these two film clips will be described in the Measures section. For the control condition, 69 participants were randomly assigned to complete the experiment without watching any film clip. Among the 69 participants, 66 of them provided valid protocols for the final data analysis (two invalid CRT-A protocols and one invalid Rorschach protocol). Thus, the final sample consists of 207 valid protocols to be included into the final data analyses. Participants received extra credit from their course instructors based on the amount of the time they participated in this study.

**Measures**

The following measures were used to conduct this study and they are listed in the order they were presented. Two questionnaires served as pre-experimental measurements for assessing interpersonal traits that may help predict responses to the films. These two baseline measurements were the Interpersonal Questionnaire (IPQ) and the Conditional Reasoning Test of Aggression (CRT-A). The IPQ served as an explicit measure to detect participants’ personality characteristics on the interpersonal circumplex and the CRT-A served as an implicit measure to monitor participants’ aggressive beliefs. Two film clips, *300* and *Braveheart*, served as stimulus materials for the experimental manipulation. Three measures served as dependent variables: selected Rorschach scores, the Post-Film Questionnaire (PFQ) to track conscious emotional reactions to the films, and the Single Category–IAT (SC-IAT).
Stimulus material. Two video clips that were easily accessible on the internet were used as experimental manipulations. One video clip depicts an aggressive and violent scene, and the other depicts a warm and compassionate scene. The violent scene is from the movie *300* (2006) and depicts a battle in which two armies engage in hand-to-hand combat with spears, swords, and shields, resulting in bloody death and dismemberment. Participants were instructed to try to identify with the main character who emerges victorious. This clip is selected to induce a dominant and aggressive mood and can be accessed at the following URL:

https://www.youtube.com/watch?v=OZdkaUU2fkY with the searched key phrase “300 insane fight scene.” The compassionate scene is from the movie *Braveheart* (1995), and was intended to induce a compassionate and loving mood in the participants of this study. The first part of the *Braveheart* clip depicts a reciprocal interpersonal interaction between a boy and a girl, with the girl showing her sympathy toward the boy by giving him a gift of thistle after he has experienced a major loss with the death of his parents. The second part of this clip depicts another reciprocal interpersonal interaction between these two characters 20 years later. The boy (now a man) returns the same gift to the girl (now a woman) as an indication of his appreciation for the compassion she showed him when they were young. The first part of this clip can be accessed at the following URL:

http://www.youtube.com/watch?v=zVKcyLbhrxg&feature=related with the searched key phrase “Braveheart – a gift of thistle” The second part of this clip can be accessed at the following URL: http://www.youtube.com/watch?v=xKMLMz0JKxk&feature=related with the searched key phrase “Braveheart – William Wallace returns Murron the flower.”
The film clip from *300* was successful in producing an aggressive-hostile mindset in Hsiao et al.’s (2011) study. The film clip from *Braveheart* has been described as an emotional, touching, moving, and loving theme from its online review. In addition, this researcher also showed this film clip to Dr. Gregory Meyer and several individuals from diverse background, including psychological assessment lab members, exchange scholars from Italy, a personal writing tutor of this researcher, and friends of this researcher from the United States and Taiwan, to solicit the feedback. Moreover, Dr. Gregory Meyer also informally showed the clip to others in different occasions. The feedback received was unanimous and all reported that it stirred the intended experimental state of feeling touched, loved, and having positive reciprocal interactions between the two characters.

**The Interpersonal Questionnaire (IPQ; Trapnell & Broughton, 2006).** The IPQ is designed to assess participants’ general interpersonal behavioral style during social interactions. It contains 72 items and defines 12 interpersonal styles: (1) assertive, (2) dominant, (3) manipulative, (4) coldhearted, (5) aloof, (6) introverted, (7) timid, (8) deferent, (9) agreeable, (10) nurturant, (11) affiliative, and (12) extraverted (Trapnell & Broughton, 2006). Each item is designed to provide a description that represents a disposition involving interactions between people (see Appendix A for sample items). This questionnaire was used to identify participants’ self-reported interpersonal dispositions. Reliability was reported to range from .65 on agreeable to .87 on introverted. Construct validity of Interpersonal Circumplex was also well documented by Gurtman in 1992 and 1993.

**The Conditional Reasoning Test of Aggression (CRT-A; James & McIntyre, 2000).** The CRT-A consists of 25 multiple-choice questions. This assessment is an
indirect measure of aggression in that it is presented to participants as a measure of critical reasoning skills, but in actuality, it is a measure of aggressive tendencies based on what the test-taker believes is the most reasonable response to different scenarios. Among the 25 multiple-choice questions, 22 of them are non filler items that are designed to capture implicit aggressive tendencies. To compute the CRT-A scores, the three filter items were excluded. For the rest of 22 conditional reasoning problems, four response options were presented for each problem. One response option represents reasoning about the situation through an aggressive mindest, one response option represents reasoning about the situation through a non aggressive mindset, and two response options represent illogical reasoning about the situation. Thus, each participant receives a total score for Aggression, Non-aggression, and Illogical scales. An example question from CRT-A is presented in Appendix B. This measure aims to assess the participants’ level of implicit cognitive readiness to perceive aggression. Regarding reliability, three types of reliabilities were reported in the CRT-A test manual (James & McIntyre, 2000). First, factor analyses indicated that four factors are better in accounting for the underlying CRT-A structure and have established the internal consistency (Alpha coefficients) for factor 1 on favoring retaliation over forgiveness ($\alpha = .86$), factor 2 on tendencies to orientate toward dominance and control ($\alpha = .85$), factor 3 on engaging in rationalization via omnipotence ($\alpha = .85$), and factor 4, on endorsing willingness to justify hostility ($\alpha = .84$). The second reliability study was related to alternative forms, comparing a text version to a verbal-visual version of the CRT-A, with reported Kuder-Richardson coefficient for .76, and .78. The third reliability study was based on a hybrid alternative forms analysis with test and re-test reliability. Participants were administered the text
version of CRT-A first and then a verbal-visual version of CRT-A two months later. The reported correlation between the total score on these two tests was .82. In terms of validity, the results from eight validation studies were also presented in the CRT-A test manual (James & McIntyre, 2000) documenting the construct validity, practical validity, and predictive validity of CRT-A with an average validity of .43 across the eight studies.

**Post-Film Questionnaire (PFQ; Hsiao, Meyer, and Mihura, 2012).** The PFQ contains 35 items that encompass five emotional scales: Hostility (6 items), Sadness (5 items), Self-Assurance (6 items), Joviality (8 items), and Communion (10 items). Joviality consists of two subscales: Joviality-Valence (4 items) and Joviality-Arousal (4 items). Communion consists of two subscales as well: Communion-Providing (5 items) and Communion-Receiving (5 items). The Hostility, Sadnesses, Self-Assurance and Joviality scales were extracted from the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1994). The reliability of these four scales has been well documented in the PANAS-X manual (Watson & Clark, 1994) with the internal consistency measured between-subjects reflecting eight different time instructions, including moment, today, past few days, past week, past few weeks, past month, past year, and general. When participants were asked to evaluate their affect using the “moment” time frame coefficient α was .82 for Hostility, .86 for Sadness, .83 for Self-Assurance, and .93 for Joviality. When participants were asked to evaluate their affect using the “today” time frame, coefficient α was .86 for Hostility, .87 for Sadness, .84 for Self-Assurance, and .94 for Joviality. The reliabilities reported in these two time frames are close to the time frame used in the current study. The construct validity for these four scales were also documented in the PANAS-X manual (Watson & Clark, 1994) through
convergent and discriminant correlations. Convergent validity correlations between self-rating vs. peer-rating was reported as .32 for Hostility, .30 for Sadness, .44 for Self-Assurance, and .36 for Joviality. At the same time, the discriminant coefficients were generally low and nonsignificant.

The Communion-Receiving and Communion-Providing emotional scales were created specifically for this study as extensions of an earlier communion scale used by Hsiao, Meyer, and Mihura (2011) to assess participants’ reactions to watching a film clip evoking compassion and sadness. Hsiao et al.’s results supported the validity of the earlier communion items as appropriate for capturing participants’ subjective emotional experience regarding love and caring. Specifically, the earlier communion scale was significantly elevated when participants were assigned to watch a film that contained sadness and loving themes versus aggressive and hostile themes. In order to further refine tune the assessment of emotional exchange, the earlier communion scale was extended from 4 items to 10 items to encompass Communion-Receiving and Communion-Providing subscales in the current study for better capturing the theme of reciprocal interaction depicted in the Love condition.

Together, these 35 items are intend to assess a spectrum of reactions to the film clips, including aggressiveness, hostility, compassion, and sympathy (see Appendix C). Participants were asked to indicate the intensity with which they experienced the 35 emotion items using the following scale: 1= very slightly or not at all, 3= moderate, to 5= extremely. The PFQ served as a measurement to track participants’ subjective emotional experience after watching the films.
The Rorschach Performance Assessment System (R-PAS; Meyer, Viglione, Mihura, Erard, & Erdberg, 2011). A total of eleven variables from the Rorschach Performance Assessment System (R-PAS) were coded in this study. They include six Thematic Codes and the five Content Codes that are essential in forming the Critical Content Index. The details illustrating the scoring rules for each of the codes are described below.

**Aggressive Movement (AGM).** AGM is scored when the content of the responses contains action taking place in the present that is clearly aggressive or hostile, such as fighting, arguing, or attacking.

**Aggressive Content (AGC).** AGC is scored when the content of the responses is perceived as aggressive, dangerous, harmful, injurious, malevolent, or predatory. It includes five subtypes: (a) weapons (e.g., gun, battleship); (b) animals that are perceived as dangerous to humans (e.g., cobra, lion); (c) animal parts that are associated with power, threat, or potential for harm (e.g., claws, fangs); (d) powerful and dangerous environmental forces (e.g., forest fire, hurricane); and (e) powerful, threatening, or predatory creatures and objects (e.g., dragon, vampire).

**Morbid Content (MOR).** MOR is scored when the content of the responses is (a) described as damaged in some way (e.g., broken mirror, smashed bugs) or (b) distress, dysphoria, or depression is attributed to the object (e.g. a sad movie, a crying face).

**Mutual of Autonomy-Pathology (MAP).** MAP is scored for any response in which the participants describe an agent or object as compromising the autonomy of another object or as destructive to it (e.g., one person harming another).
**Mutual of Autonomy-Health (MAH).** MAH is scored for any response in which the participants describe two autonomous entities in a reciprocally interactive activity (e.g., a couple kissing each other).

**Cooperative Movement (COP).** COP is scored when the content of the responses contains descriptions of cooperative, positive, or pleasant interactions between two or more objects. It includes two subtypes: (a) mutually enhancing or satisfying interactions (e.g., two people dancing together), and (b) teamwork or “helping” responses (e.g., two men carrying a pot).

**Anatomy (An).** An is scored for all internal animal and human body parts and structures that cannot ordinarily be seen from the outside, including an open wound, a skull, a pelvis, intestines, or lungs.

**Blood (Bl).** Bl is scored when participants’ responses contain blood imagery. Cuts or wounds described as red would also be scored in this category.

**Explosion (Ex).** Ex is scored when participants indicate explosion-related activities in their responses. Examples including bomb blasts or volcanic eruptions.

**Fire (Fi).** Fi is scored when participants’ responses include fire imagery, such as flames, embers, or smoke.

**Sex (Sx).** Sx is scored when participants provide responses related to sexual organs or activity, human reproductive organs or activity, sexually suggestive clothing or underwear, or see-through clothing.

**Critical Content Index Percent (CCI%).** CCI is computed as the sum of An + Bl + Ex + Fi + Sx + MOR + AGM divided by the total number of responses in a protocol and multiplied by 100%.
According to Hsiao et al. (2011, 2012), the inter-rater reliability for these Rorschach variables has ranged from good to excellent. Specifically, Hsiao et al. reported intraclass correlations of .74 on MAH, .76 on MAP, .83 on both Fi and Sx, .87 on AGM, .93 on An, and .94 on MOR. In addition, the reliability for COP has ranged from .76 to .94 as reported in the R-PAS manual. The validity of these codes were also documented in R-PAS technical manual section. Specifically, Mihura, Meyer, Dumitrascu, and Bombel (2013) reported the validity of individual Rorschach variables based on systematic reviews and meta-analyses and indicated that the strength of validity evidence is within the range of good support for COP and MOR, though within the range of little support for AGM. In terms of AGC, MAH, MAP, and CCI%, Meyer et al. (2011) also reported the strength of validity evidence for these variables ranged from good to strong support. In addition, Graceffo, Mihura, and Meyer (2014) conducted a meta-analysis on the Mutuality of Autonomy Scale (MA) and the results indicated that the MA scale is a valid measure of relational health and general psychopathology.

**Inter-rater reliability of the selected R-PAS codes in current study.** The inter-rater reliability for coding these 11 variables in the current study was established through a systematic training and coding practice using Hsiao’s (2011) dataset. To establish inter-rater reliability on the selected R-PAS codes, an undergraduate research assistant was recruited and trained by this researcher with the following steps. First, this researcher and the undergraduate assistant reviewed the coding criteria for the eleven R-PAS codes in the R-PAS manual and practiced coding them by using Table 7.1 in the R-PAS manual, one hundred responses for coding practice. This researcher and the undergraduate assistant discussed any questions they had from the coding practice and
consulted Table 7.3 in the R-PAS manual, coding rationales for practice responses, to clarify those coding questions. After this the researcher and undergraduate assistant coded the responses for the example case in Table 11.1 in the R-PAS manual. The undergraduate research assistant only made one error on this case so this researcher and the undergraduate assistant decided to utilize the dataset in Hsiao et al.’s (2011) study to establish inter-rater reliability.

Hsiao et al.’s (2011) dataset includes 76 valid Rorschach protocols that contain a total of 1878 responses. This researcher and the undergraduate assistant started by coding the first two protocols, and then discussed any differences to fine tune their coding benchmarks. After that, both of them coded the next three protocols, and then discussed any differences to further refine the coding benchmarks. After that, both of them increased the coding to the next five protocols, and then discussed differences again to fine tune benchmarks. After coding the first 10 protocols, this researcher and the undergraduate assistant then sequentially coded sets of 10 protocols and discussed differences to fine tune the benchmarks throughout the rest of the protocols. During this process, when there were ambiguities on the coding thresholds, this researcher consulted the first author of R-PAS manual, and chair of the present dissertation, Dr. Gregory J. Meyer, to clarify the thresholds. This researcher and the undergraduate research assistant then applied the newly clarified coding threshold to the next coding tasks. Among these discussions, the Aggressive Content code (AGC) received the most attention on the needs for clarifying the coding thresholds. As a result, an expended list of AGC threshold examples was generated to facilitate improved coding reliability (See Appendix D). The original coding discrepancies between this researcher and the undergraduate assistant on
each R-PAS variable were retained to compute the reliability between them. The final scores resolved by discussion also were saved to compute the reliability of each rater with the final score.

Table 3.1 lists the inter-rater reliability computed based on the intraclass correlation (ICC) across all 76 protocols. The ICC used an exact agreement model and results are reported for “single measures” (i.e., the reliability of one coder with another), not “average measures” (i.e., the reliability of the average score over both coders). Data are reported between this researcher and the undergraduate assistant (r_{1-2}), this researcher and the final resolved coding (r_{1-F}), and the undergraduate assistant and the final resolved coding (r_{2-F}). The reliability ranges from the highest (r_{1-F} = 1.0) on three of the Critical Content codes (Bl, Ex, and Fi) to the lowest (r_{1-2} = .66) on one of the interpersonal Thematic codes (MAH). Because the first 10 protocols in this dataset were coded while still trying to fine tune benchmarks, the first 10 protocols were then excluded to see whether the inter-rater reliability would increase. When the inter-rater reliability was computed with the exclusion of the first 10 protocols, it ranges from the highest (r_{1-F} = 1.0) on three of the Critical Content codes (An, Bl, and Ex) to the lowest (r_{1-2} = .75) on one of the interpersonal Thematic codes (MAH). Overall the results suggested that the inter-rater reliability for the selected R-PAS variables ranged from good (r = .60 - .74) to excellent (r ≥ .75).

Based on these results, this researcher believed that the undergraduate research assistant had a pretty good grasp on the coding rules. Thus, the undergraduate research assistant was designated to code the selected R-PAS variables for all 217 protocols obtained for this study, which contains a total of 5332 responses. In addition, the
undergraduate research assistant was blind to condition as well as the study hypotheses while coding these responses.

Table 3.1
Summary of Inter-Rater Reliability of the R-PAS Variables with Intraclass Correlations Based on the Number of Protocols

<table>
<thead>
<tr>
<th>R-PAS Variables</th>
<th>n = 76</th>
<th>n = 66</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC₁₂</td>
<td>ICC₁₋F</td>
</tr>
<tr>
<td>An</td>
<td>0.97</td>
<td>0.99</td>
</tr>
<tr>
<td>Bl</td>
<td>0.98</td>
<td>1.00</td>
</tr>
<tr>
<td>Sx</td>
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<td>0.99</td>
</tr>
<tr>
<td>Ex</td>
<td>0.88</td>
<td>1.00</td>
</tr>
<tr>
<td>Fi</td>
<td>0.96</td>
<td>1.00</td>
</tr>
<tr>
<td>AGC</td>
<td>0.86</td>
<td>0.99</td>
</tr>
<tr>
<td>AGM</td>
<td>0.92</td>
<td>0.96</td>
</tr>
<tr>
<td>MAP</td>
<td>0.82</td>
<td>0.97</td>
</tr>
<tr>
<td>MOR</td>
<td>0.89</td>
<td>0.99</td>
</tr>
<tr>
<td>COP</td>
<td>0.85</td>
<td>0.99</td>
</tr>
<tr>
<td>MAH</td>
<td>0.66</td>
<td>0.97</td>
</tr>
<tr>
<td>CCI%</td>
<td>0.97</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Note. ICC₁₋₂ indicates correlation between this researcher’s coding and the undergraduate research assistant’s coding. ICC₁₋F indicates correlation between this researcher’s coding and the final resolved coding. ICC₂₋F indicates correlation between the undergraduate research assistant’s coding and the final resolved coding.
The Implicit Association Test (IAT) is an experimental method introduced by Greenwald, McGhee, and Schwartz in 1998. It is designed to measure the degree of automatic connection between the concepts and attitudes related to objects and values presented on a computer screen. The design of the IAT requires participants to rapidly sort various stimulus objects into two paired categories by pressing two designated keys on a computer (the letter “d” and the letter “k”). It has been suggested that easier pairings (faster responses) can be interpreted as having stronger associations in memory than more difficult pairings (slower responses). The time differences among the responses of each participant to the paired stimuli represent implicit concepts and attitudes towards the presented objects (e.g., race, sexual orientation, religion etc.). “The SC-IAT is a modification of the Implicit Association Test, which measures the strength of evaluative associations with a single attitude object” (Karpinski & Steinman, 2006, p.16). According to Karpinski and Steinman (2006), the SC-IAT was able to produce effects equivalent to the standard IAT but also has the advantage of measuring attitudes that have a single direction by nature, such as ‘self’ related concepts, rather than two opposing directions.

The SC-IAT is incorporated into the current study because it provides an alternative way to assess participants’ implicit reactions to the film clips, including aggression and intimacy. In order to employ this methodology, the five self target words that Karpinski and Steinman used in their study have been adopted in this study. Moreover, 20 pictures were selected from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008), which provides a wide range of pictures that
have been studied and found to robustly elicit identified types of affect. Of the 20 pictures selected for use in this study, 10 contain aggressive imagery, and 10 contain interpersonally close or compassionate imagery. The selection of these 20 pictures was based on the unanimous consensus of top ratings from a small-group pilot study conducted in the Psychological Assessment lab at the University of Toledo. The target words and the 20 pictures from the IAPS (with their slide identification numbers) are included in Appendix E.

The SC-IAT designed for this study consists of four blocks, with blocks 1 and 3 containing 25 trials that were used as practice. Blocks 2 and 4 contain 75 trials that were used for the actual test. In each trial, one of the stimuli was randomly selected from the pool of target words or target pictures and presented on a computer screen. The participants were asked to classify the presented words or pictures into their corresponding categories as fast as they could by pressing a designated key on the keyboard. For example, in Block 1, Trial 1, if the stimulus presented on the computer screen was a self-word or an aggressive picture, the participants were asked to classify the stimulus into its corresponding category as listed on the left side of the screen by clicking the “F” key on the left side of the keyboard. On the contrary, if the stimulus presented on the computer screen was an image that represented intimacy the participants were asked to classify the stimulus into its corresponding category as listed on the right side of the screen by clicking the “J” key on the right side of the keyboard.

Block 2 and 4 examined participant’s reaction time when responding to the stimuli that were categorized as either aggression or self in one block, and love or self in another block. To compute the SC-IAT, the correct response rates in Blocks 2 and 4
were first reviewed to evaluate whether the participant provided a valid response to the task. Karpinski and Stinman (2006) recommend a threshold of 80% correct classifications of the IAT stimuli. Among the 207 protocols, only five protocols produced a correct response rate lower than .80 (i.e., .71, .77, .78, .79, .79, respectively). Because they are close to the recommended cut-off, they were retained for the final analyses. In addition to the preview of the correct response rates, the reaction time distribution was also taken into consideration. Following the suggestion from Karpinski and Stinman (2006), trials that have a reaction time less than 350 ms were excluded to control for impossibly fast responses. Following Greenwald, Nosek, and Banaji (2003), trials that had reaction times greater than 10,000 ms were also excluded. Five scales for the SC-IAT were computed. They are RT_M_LovSelf (mean reaction time for Love + Self block), RT_M_AggSelf (mean reaction time for Aggression + Self block), RT_SD_Correct (standard deviation of the reaction time on correct responses), D_LovSelf \[D \text{ value for LovSelf} = (\text{RT}_M\_\text{AggSelf} – \text{RT}_M\_\text{LovSelf}) / \text{RT}_SD\_\text{Correct}, \text{with higher scores indicating a preference for loving and self} \], and D_AggSelf \[D \text{ value for AggSelf} = (\text{RT}_M\_\text{LovSelf} – \text{RT}_M\_\text{AggSelf}) / \text{RT}_SD\_\text{Correct}, \text{with higher scores indicating a preference for aggression and self} \]. The latter two scales are identical except in the direction of their effect.

Schnabel Asendorph, and Greenwald (2008) reviewed the psychometric properties of IAT measures and summarized that the reliability with the internal consistency for IAT measures typically ranges from .70 to .90. Additionally, Nosek, Greenwald, and Banaji (2006) reported that the test-retest reliability of IATs had a median of .56 across different studies. In terms of validity, Schnabel et al. (2008)
reviewed the convergent and discriminant validity between IATs and explicit self-report measures as well as the predictive validity of IATs for behavioral measures. For convergent and discriminant validity, the average correlations between IATs and explicit self-reports were .24 (Hofmann, Gawroski, Gschwendner, & Schmitt, 2005) and .37 (Nosek et al, 2005). Regarding the predictive validity of IATs for behavior measurements, Schnabel et al summarized that the IATs were superior to explicit measures when predicting socially sensitive behaviors, such as stereotypes or prejudice. Additionally, IATs predict spontaneous behavior better than explicit measures, whereas explicit measures predict controlled behavior better than IATs.

**Procedure**

The study was conducted in a computer lab on the campus of the University of Toledo, and participants consisted of students recruited from undergraduate psychology classes. The whole experiment was administered via computer using the MediaLab and DirectRT psychology experiment software applications (Jarvis, 2012a; Jarvis, 2012b). Although the maximum capacity to run an experiment could be up to 16 members in each session, the highest number of participants who participated in an experiment session was 10. To minimize distractions and interference, participants were seated adjacent to the wall, the aisle, or the window, around the perimeter of the room. Also, in each experimental session, the participants all watched the same film clip at the same time, with the setting simulating the atmosphere of watching the movie in a movie theater. That is, each participant was given a headphone set and the light was turned off when watching the movie clip. All of the data and the experiment sessions were administered
by this researcher with some assistance from an undergraduate assistant to help set up the Rorschach cards and headphone sets prior to the experiment.

Participants were given a copy of the IRB-approved Informed Consent Form, which describes this as a study of how media images may impact visual perceptions and emotions. After participants consented, they were provided with instructions that specified the tasks they were to perform. The participants completed a demographic form at the beginning of the study and then completed the IPQ and CRT-A. Participants had already been assigned to one of the three experimental conditions: aggression, love, or neutral. In the aggression condition, participants were assigned to watch the 300 film clip. In the love condition, participants were assigned to watch the Braveheart film clip. In the neutral condition, participants were not assigned to watch any film clip, such that their total time in the study was several minutes shorter than for the other two groups. The 300 film clip is a commercially available R-rated motion picture that contains combat scenes. The Braveheart film clip is a commercially available R-rated movie that contains an emotionally touching scene in which the male and female characters reveal their emotions and engage in reciprocal interpersonal interactions during two different time frames. Participants were exposed to the stimuli for approximately three minutes. Participants were asked to attend to the stimuli and to press the computer space bar at the beginning and at the end of the video clip to indicate that their attention was directed toward the stimuli. Participants in neutral condition were not given any video clip so as to not induce any specific emotional state and to represent participants’ normal status as much as possible.
Next, the Rorschach Computerized Group Administration (Horn, Hsiao, & Meyer, 2011) procedure was applied in this study to administer the Rorschach in a group format. Participants provided responses to the 10 Rorschach inkblots. They held and viewed each inkblot, one at a time, and responded to the question, “What might this be?” They recorded up to three responses to each inkblot card using a computer keyboard. After participants had viewed each of the 10 cards and provided all the responses, which took about 15 minutes, they were told that they had finished the first phase (Response Phase) of the Rorschach and they were told that later they would finish the second phase (Clarification Phase) of the Rorschach. Participants were instructed next to complete the Single Category Implicit Association Test (SC-IAT), followed by the PFQ questionnaire. Because the SC-IAT was administered about 15 minutes after the films and because this might be beyond a reasonable time frame (about 10 minutes) to see carryover effects from the films (Rottenberg et al., 2007), this measure was de-emphasized in the subsequent analyses. After completing the SC-IAT, participants were asked to complete the PFQ by recalling their emotional experience after watching the film.

The PFQ measurement served two purposes. One purpose was to provide a subjective report on how participants viewed their experience of these two films so that this researcher could track the conscious emotional reactions they induced. The second purpose was to facilitate the perpetuation of their experience of the film and enhance the carryover effects of the induced emotions during the subsequent Rorschach Clarification Phase. Participants in the control condition were asked to report their emotional experience using the “how they felt at the beginning of the experiment” time frame on the PFQ rather than rating how they felt while watching the film.
To administer the second phase of the Rorschach (the Clarification Phase), participants were shown the initial responses they had previously typed in during the Response Phase and asked to clarify the location where they saw the object(s) on the inkblot and the features of the inkblot that helped them form their responses. Two examples of how to clarify the location of their percept using a paper location sheet were presented by this researcher. During the presentation of the second example, participants were asked to follow the step-by-step procedure demonstrated by this researcher to clarify their own first response on Card I. Participants were asked to raise their hands whenever they had questions, and this researcher approached that individual to answer his or her questions. After participants became familiar with how to complete the Clarification Phase and circle the location sheet, they were given three to four minutes per card to clarify the remainder of their responses. After completing the CRT-A, IPQ, Rorschach Response Phase, SC-IAT, PFQ, and Rorschach Clarification Phase, participants were debriefed about the study. They were given the opportunity to ask any questions they might have. Figure 3.1 presents a visual diagram of the time sequence of measures administered in the current study in order to facilitate understanding of the procedures.

In terms of the Rorschach Computerized Group Administration, several studies have applied this newly updated procedure to validate Rorschach variables using an experimental design (Charek, Meyer, & Mihura, 2015; Horn, Meyer, Mihura, 2009; Hsiao et al., 2011). The advantages of this group administration method were reviewed by Charek et al. (2015). In addition, Harrower-Erickson and Steiner (1951) conducted a systematic analysis of the effect of test repetition and method of administration.
(individual versus group) on Rorschach scores, finding largely consistent performance
across methods, noting a few small differences in Determinants and a slight tendency to
provide more Whole location responses under group administration procedures. Thus, it
was expected that the group administration would be appropriate to be applied in the
current study focusing on validating the interpersonally related Thematic codes as well as
the Critical Content codes.

Consent forms were collected and stored separately from the other data. Participation was completely voluntary, and participants were told they may stop
participation at any time. Participants also had the option to obtain the results of the
study if they wished, although no information would be available concerning individual
scores or interpretations from any of the tasks. Except for the Rorschach inkblots and
location sheets, all of the data were presented and recorded through computer by using
MediaLab and DirectRT psychology experimental software applications (Jarvis, 2012a;
Jarvis, 2012b). All results remained confidential. The data were saved as Excel files and
then imported into IBM SPSS 22 to conduct statistical analyses.
Figure 3.1. Time Sequence of measures administered in the current study
**Data Analyses**

**Main analyses.** This study employs a quantitative methodology of data analysis to determine whether the results support the research hypotheses. The data analyses first examined the results of the PFQ to answer Research Question 1: Did the two film clips, one with a violence and aggression theme and the other with a communion and love theme, successfully induce the expected mental state in our participants as assessed by self-report? The mean and standard deviation of each PFQ variable were examined across the three conditions (300, control, and Braveheart) and three independent t tests were conducted to examine differences between each group on each of the PFQ variables: (1) 300 vs. control, (2) Braveheart vs. control, and (3) 300 vs. Braveheart. The t values, p values, and Cohen’s d values of these three comparisons form a manipulation check.

Next, the data analysis examined the results of the Rorschach and IAT to answer Research Question 2: Did the Rorschach and IAT successfully capture the carryover effect of the induced mental state? The same data analyses used to answer Research Question 1 were applied to the Rorschach variables and the IAT. In addition, a focused contrast ANOVA was computed on each Rorschach variable and IAT score to dimensionally quantify the effect across the three conditions and provide a more comprehensive and accurate view of the overall results and directly address Hypothesis 2a (Group differences would be found among the three conditions on Aggressive-related variables) and Hypothesis 2b (Group differences would be found among the three conditions on Communion-related variables). When conducting the focused contrast ANOVA for hypothesis 2a, the aggression condition was assigned a contrast weight of 1,
the neutral condition was assigned a contrast weight of 0, and the love condition was assigned a contrast weight of -1 to indicate that the Aggressive-related variables were expected to increase in the aggression condition and to decrease in the love condition. When conducting the focused contrast ANOVA for hypothesis 2b, the love condition was assigned a contrast weight of 1, the neutral condition was assigned a contrast weight of 0, and the aggression condition was assigned a contrast weight of -1 to indicate that the Communion-related variables were expected to increase in the love condition and to decrease in the aggression condition.

Supplementary analyses. After obtaining results from the main analyses, this researcher answered the third research question: Would the participants who exhibit consistent explicit self-representation and implicit social cognition have a better capacity to absorb the films that correspond to their self-concepts and thus show stronger experimental effects reflected on their Rorschach performance? In other words, would there be an additive effect on priming for participants who displayed consistency between their explicit self-representation and implicit social cognition when watching a film that corresponded to their mindsets? If so, baseline psychological characteristics and experimental condition should both contribute to regression models predicting Rorschach and IAT scores.

Regarding Hypothesis 3a, this researcher assumed that participants who had high scores both on the IPQ Hostile-Dominance (high explicit self-representation on aggression) and the CRT-A (high implicit social cognition on aggression) prior to watching the violence and aggression (300) film would absorb this film better than others. Thus, those participants were expected to have higher AGM, AGC, MOR, MAP,
and Critical Content Index scores on the Rorschach and higher self-hostile reaction time scores on the IAT after watching the 300 film clip. At the same time, participants were expected to have average scores in the neutral condition and lower scores after watching the Braveheart film clip. For these analyses, the experimental effect of the specific condition was considered as one dimension, and the degree of consistency between implicit (CRT-A) and explicit (IPQ) reports of hostility was considered as another dimension. This researcher anticipated that the two dimensions combined would produce additive effects, such that Rorschach scores would be better predicted by having both variables in the equation rather than having either one alone.

To prepare for the regression analysis for hypothesis 3a, the Hostile-Dominant variable on the IPQ was created. The Hostile-Dominant variable would be best represented by averaging the T-scores from four dimensional scales (i.e., Dominance, Social Potency, the reverse of Love, and the reverse of Agreeableness). After the average score was computed it was converted to a z score. At the same time, a z score for the CRT-A Aggression variable was also computed. Then, the composite score was created by averaging the z scores from the IPQ Hostile-Dominant variable and the CRT-A Aggression variable to represent the Aggression-Hostility dimension as one predictor. The aggression hypothesis-testing groups (Love < Neutral < Aggression) variable was created by assigning weights to each condition with Love = -1, Neutral = 0, and Aggression = 1 to indicate the direction of the Aggression Condition dimension as another predictor. Thus, this dimension was bipolar and it reflects an experimental manipulation that should inhibit hostile – dominance at the low end and an experimental manipulation that should foster hostile – dominance at the high end. Hierarchical
regression analyses were applied by using the Aggression Condition dimension as the first predictor and the Aggression-Hostility dimension as the second predictor to examine whether the second predictor would additively contribute to predicting the DVs.

For Hypothesis 3b, this researcher assumed that participants who endorsed high scores on the IPQ Communion-Love (high explicit self-representation on communion) and low scores on the CRT-A (low or no implicit social cognition on aggression) prior to watching the *Braveheart* film clip would absorb this film better than others. Thus, participants would have higher COP and MAH scores on the Rorschach and higher self-love scores on the SC-IAT after watching the *Braveheart* film clip. At the same time, participants were expected to have average scores in the neutral condition and lower scores after watching the *300* film clip. To continue this second supplemental data analyses, similar steps were followed to prepare for the regression analysis for hypothesis 3b. First, the Communion-Love variable on the IPQ was created. The Communion-Love variable would be best represented by averaging the T-scores from five dimensional scales (i.e., Social Closeness, Love, Agreeableness, the reverse of Dominance, and the reverse of Social Potency). After the average score was computed, the z scores for this self-reported Communion-Love variable were then computed. At the same time, the already computed z scores from the CRT-A Aggression variable was reversed. Then, the composite score was formed by averaging the two z scores to represent the Communion-Love dimension as one predictor. The love hypothesis-testing groups (Aggression < Neutral < Love) was computed by assigning weights to each condition with Aggression = -1, Neutral = 0, and Love = 1 to indicate the direction of the Love Condition dimension as another predictor.
Summary

This chapter restated that the main purpose of this study aimed to validate the selected Rorschach Thematic and Critical Content codes through the mood induction procedure by testing out the research questions and hypotheses generated from the literature review in chapter 2. The participants were recruited from introductory psychology courses at the University of Toledo and randomly assigned to one of the three conditions: two experimental conditions and one control condition. Power analyses to determine the minimal sample size for obtaining the expected medium effect size with the significant level at 0.05 and power of 0.8 suggested that a minimal of sixty-four participants for each condition was required. The final sample size exceeded this requirement and consisted of 207 participants with valid protocols for final data analyses. The two film stimulus materials and five measurements utilized in this study were documented with detailed description of their properties, including their total items, subscales, coding criteria, purpose, and reliabilities. The data collection procedures for two experimental and one control conditions were also discussed. Finally, the methods of data analysis for each of the research questions and hypotheses were presented. Results of the data analyses based on the actual collected sample for this study are presented in the following chapter.
Chapter Four

Results

Introduction

A total of five measurements were included in this study to predict or examine the impact of aggression and communion films. Two cognitive-affective mindsets, aggressive-hostile and communion-love, were induced through watching two different film clips followed by the administration of the Rorschach, PFQ, and SC-IAT. For the five measurements included in this study, the IPQ (self-report explicit measurement) and the CRT-A (self-report implicit measurement) were utilized as baseline measurements to predict responses to the films and they were administered prior to watching the film clips. The PFQ (self-reported explicit measurement) was used to monitor the conscious awareness of the impact from the film clips and examine whether the intended cognitive-affective mindsets were successfully induced in the experimental conditions. The Rorschach and the SC-IAT were used as performance-based measurements and tested for their validity to capture the carryover effects from the experimental manipulations. This chapter presents the results of the data analyses for the two main research questions and hypotheses (1, 2a, and 2b) and one supplemental research question and hypothesis (3a and 3b). The results are organized into five main sections: (a) introduction, (b) demographic information, (c) testing the research questions and hypotheses: main analyses, (d) additional analyses, and (e) summary. Section (a) provides the outline and the organization of this chapter. Section (b) presents the results of demographic information regarding the participants, including their age, education, ethnicity, gender, and marital status. Section (c) illustrates the results examining whether the expected
priming effects were successfully produced based on the participant’s self-report on the explicit measurement and, if so, whether the same priming effects carry over to the Rorschach and SC-IAT and are successfully captured by selected R-PAS codes and SC-IAT scales. Section (d) expanded the data analyses to explore factors that might have led to the unexpected results from Section (c). The additional analyses including examining the carryover effects after coding the selected R-PAS variables based on the Response Phase (RP) only, exploring results several newly created codes, and examining additive and interactive effects of gender across the three conditions through 2x3 factorial ANOVAs and focused-contrast ANOVAs. Section (e) concludes this chapter with a brief summary of the analyses that were included in this study.

**Demographic Information**

The final data analyses included the valid protocols of 207 out of 216 participants. To provide a better comprehension of this sample, the demographic information, including age, education, ethnicity, gender, and marital status, were first analyzed and descriptive statistics are presented below. No differences on these variables were statistically significant across conditions.

**Age.** Within the 207 participants, their age ranges from 16 years old as the youngest to 40 years old as the oldest, with 89.9% of the participants reporting their age between 18 and 21. A similar distribution is observed across each condition as 91.3% in the aggression condition, 84.8% in the neutral condition, and 93.1% in the love condition reported their age was between 18 and 21. Age was not significantly different across conditions \[F (2, 204) = .37, p > .05, R^2 < .01\].
**Education.** For the 207 participants, 184 of them were freshman or sophomore (88.9%). Similar percentages were freshman or sophomores in the aggression condition (92.7%), neutral condition (87.9%), and love condition (86.1%). Chi square analysis indicated that there was no significant difference across conditions on education \[\chi^2 (8, N = 207) = 14.32, p > .05, V = .19\].

**Ethnicity.** Five ethnicity categories were specified in this study for the participants to identify. These categories are White, Black, Asian/Pacific Islander, Hispanic Origin, and Other. Among the total participants, most reported as being White (74.4%), followed by Black (19.8%). Even though the participants were randomly assigned to each condition, the proportion of participants reporting as White was the highest in the aggression condition (81.2%), followed by the neutral condition (71.2%), and the love condition (68.1%). Participants who reported as Black were equally assigned to the neutral and love condition (24.2% and 23.6, respectively), but less than in the aggression condition (11.6%). Chi square analysis indicated that there was no significant difference across conditions on ethnicity \[\chi^2 (8, N = 207) = 9.56, p > .05, V = .15\].

**Gender.** In this study, the gender category was limited to male and female, even though use of more gender categories has been encouraged in research to facilitate the exploration of diversity issues. Within the 207 participants, 86 (41.6%) identified themselves as male and 121 (58.5%) identified themselves as female. Even though participants were randomly assigned to each condition, the percentage of males was highest in the aggression condition (44.9%), midrange in the neutral condition (40.9%), and lowest in the love condition (38.9%). As would be expected, the percentage of
females was highest in the love condition and lowest in the aggression condition. Nonetheless, Chi square analysis indicated that there was no significant difference across conditions on gender \( \chi^2 (2, N = 207) = .55, p > .05, V = .05 \).

**Marital Status.** In this study, 194 of 207 (93.7%) participants reported as single. Within each condition, more than 90% of the participants reported their marital status as single as well (95.6% in aggression, 93.9% in neutral, and 91.7% in the love condition). Chi square analysis indicated that there was no significant difference across conditions on marital status \( \chi^2 (6, N = 207) = 11.015, p > .05, V = .16 \).

**Testing the Research Questions and Hypotheses: Main Analyses**

The main analyses aimed to answer research questions 1 and 2: Did the two film clips successfully induce the expected cognitive-affective mindsets in our participants via their self-report (Question 1) and performance on the Rorschach and SC-IAT (Question 2)? The results from the Post-Film Questionnaire (PFQ) are presented to answer research question 1 with a review of the descriptive statistics followed by examination of the independent \( t \)-tests across three conditions. Results from the Rorschach and SC-IAT are presented to answer research question 2, with a review of the descriptive statistics and independent \( t \)-tests.

**The Post-Film Questionnaire (PFQ).**

**Descriptive statistics of the PFQ.** Table 4.1 provides the means and standard deviations of the PFQ variables in the aggression, control, and love conditions, as well as the mean and standard deviation based on the total sample. Because the current study utilized exactly the same film clip as Hsiao et al.’s (2011) study in the aggression condition, Table 4.2 displays descriptive statistics of the PFQ variables in the aggression condition.
and neutral conditions along with results from the aggression condition in Hsiao et al.’s (2011) study to provide additional benchmarks on comparing the carryover effect in the aggression condition. The Communion subscales in Hsiao et al.’s (2011) study only included four items and are not equivalent to the Communion subscales in this study. Thus, the scores on the Communion scale and its subscales are omitted in this table. In addition, Table 4.3 presents descriptive statistics of the PFQ variables when comparing them with the normative data reported in PANAS-X manual.

Table 4.1
*Means and Standard Deviations of the PFQ Variables across Conditions*

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
<th>Total (n = 207)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Sadness</td>
<td>9.17</td>
<td>4.32</td>
<td>8.30</td>
<td>3.97</td>
</tr>
<tr>
<td>Self-Assurance†</td>
<td>18.14</td>
<td>8.06</td>
<td>14.42</td>
<td>5.87</td>
</tr>
<tr>
<td>Joviality</td>
<td>19.14</td>
<td>8.66</td>
<td>20.68</td>
<td>8.31</td>
</tr>
<tr>
<td>Joviality-Valence†</td>
<td>7.65</td>
<td>4.23</td>
<td>10.39</td>
<td>4.25</td>
</tr>
<tr>
<td>Joviality-Arousal†</td>
<td>11.49</td>
<td>5.30</td>
<td>10.29</td>
<td>4.30</td>
</tr>
<tr>
<td>Communion</td>
<td>18.84</td>
<td>7.99</td>
<td>25.02</td>
<td>9.95</td>
</tr>
<tr>
<td>Communion-Providing†</td>
<td>9.52</td>
<td>4.63</td>
<td>12.47</td>
<td>5.45</td>
</tr>
<tr>
<td>Communion-Receiving†</td>
<td>9.32</td>
<td>3.82</td>
<td>12.55</td>
<td>4.83</td>
</tr>
</tbody>
</table>

† PFQ variables that were listed in hypotheses.
Table 4.2  
*Means and Standard Deviations of the PFQ Variables in Aggression and Neutral Conditions in Current Study Comparing with Hsiao et al.’s (2011) Aggression Condition*

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Hsiao et al.’s (2011) Aggression (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Hostility</td>
<td>13.38</td>
<td>4.92</td>
<td>8.92</td>
</tr>
<tr>
<td>Sadness</td>
<td>9.17</td>
<td>4.32</td>
<td>8.30</td>
</tr>
<tr>
<td>Self-Assurance(^1)</td>
<td>18.14</td>
<td>8.06</td>
<td>14.42</td>
</tr>
<tr>
<td>Joviality-Valence(^1)</td>
<td>7.65</td>
<td>4.23</td>
<td>10.39</td>
</tr>
<tr>
<td>Joviality-Arousal(^1)</td>
<td>11.49</td>
<td>5.30</td>
<td>10.29</td>
</tr>
</tbody>
</table>

\(^1\) PFQ variables that were listed in hypotheses.

Table 4.3  
*Means and Standard Deviations of the PFQ Variables in Neutral Condition Comparing with PANAS-X Scales in Normative Data*

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Neutral (n = 66)</th>
<th>PANAS-X Moment (n = 1,027)</th>
<th>PANAS-X Today (n = 1,007)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Hostility</td>
<td>8.92</td>
<td>3.93</td>
<td>9.30</td>
</tr>
<tr>
<td>Sadness</td>
<td>8.30</td>
<td>3.97</td>
<td>9.40</td>
</tr>
<tr>
<td>Self-Assurance(^1)</td>
<td>14.42</td>
<td>5.87</td>
<td>16.50</td>
</tr>
<tr>
<td>Joviality</td>
<td>20.68</td>
<td>8.31</td>
<td>21.70</td>
</tr>
</tbody>
</table>

\(^1\) PFQ variables that were listed in hypotheses.

**Results of research question and hypothesis 1.** According to research hypothesis 1, it was expected that participants in the aggression condition would report high scores on Joviality-Valence, Joviality-Arousal, and Self-Assurance scales when compared to the neutral condition. Participants in the love condition would report higher scores on Communion-Providing and Communion-Receiving scales when compared to the neutral condition. Such a pattern would then reflect the successful induction of the
target cognitive-affective mindsets. The results of the independent t-tests of the PFQ across the three conditions are presented below to test the research hypothesis 1.

**Independent t-tests of the PFQ across three conditions.** Table 4.4 presents the independent t-tests, $p$ values, and Cohen’s $d$ values of the PFQ variables when comparing between aggression and neutral, love and neutral, and aggression and love conditions. As expected, the Self-Assurance scale was statistically significantly higher in the aggression condition than the neutral condition. In addition, the Hostility scale was unexpectedly also significantly elevated in the aggression condition than the neutral condition. Neither Joviality-Valence nor Joviality-Arousal was elevated as hypothesized in the aggression condition relative to the neutral condition. On the contrary, the Joviality-Valence was significantly lower in the aggression condition when comparing to the neutral condition. Sadness, Communion, Communion-Providing, and Communion-Receiving scales were found significantly elevated in the love condition when comparing to the neutral condition. Moreover, when comparing the aggression with the love condition, the Hostility, Self-Assurance, and Joviality-Arousal scales were significant higher in the aggression condition than the love condition while the Sadness, Joviality-Valence, Communion, Communion-Providing, and Communion-Receiving scales were significant higher in the love condition than the aggression condition. Overall, despite some anomalies, the results supported hypothesis 1 showing that the selected films in the aggression and love conditions successfully induced the consciously experienced and targeted cognitive-affective mindsets with the effect sizes ranging from moderate ($d = .35$) on Sadness to very large ($d = 1.61$) on Hostility and Communion-Providing when comparing these scores between the aggression and love conditions.
Table 4.4
Independent t-Tests, p Values, and Cohen's d Values of the PFQ Variables between Conditions

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Aggression vs. Neutral (df = 133)</th>
<th>Love vs. Neutral (df = 136)</th>
<th>Aggression vs. Love (df = 139)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>d</td>
</tr>
<tr>
<td>Hostility</td>
<td>5.79</td>
<td>&lt;0.01</td>
<td>1.01</td>
</tr>
<tr>
<td>Sadness</td>
<td>1.22</td>
<td>0.23</td>
<td>0.21</td>
</tr>
<tr>
<td>Self-Assurance¹</td>
<td>3.05</td>
<td>&lt;0.01</td>
<td>0.53</td>
</tr>
<tr>
<td>Joviality</td>
<td>-1.05</td>
<td>0.29</td>
<td>-0.18</td>
</tr>
<tr>
<td>Joviality-Valence¹</td>
<td>-3.76</td>
<td>&lt;0.01</td>
<td>-0.65</td>
</tr>
<tr>
<td>Joviality-Arousal¹</td>
<td>1.45</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>Communion</td>
<td>-3.98</td>
<td>&lt;0.01</td>
<td>-0.69</td>
</tr>
<tr>
<td>Communion-Providing¹</td>
<td>-3.39</td>
<td>&lt;0.01</td>
<td>-0.59</td>
</tr>
<tr>
<td>Communion-Receiving¹</td>
<td>-4.31</td>
<td>&lt;0.01</td>
<td>-0.75</td>
</tr>
</tbody>
</table>

Note. Bold font indicates $p < .05$ and the corresponding Cohen’s $d$ value. To facilitate interpretation, positive $d$ values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.

¹ PFQ variables that were listed in hypotheses.

The selected Rorschach Performance Assessment System (R-PAS) codes.

Descriptive statistics of the selected R-PAS codes. Table 4.5 presents the descriptive information regarding the means and standard deviations of the selected R-PAS variables in the aggression, control, and love conditions as well as the mean and standard deviation for the total sample. Because the current study employed exactly the same film clip as Hsiao et al.’s (2011) study in the aggression condition, Table 4.6 lists descriptive statistics for the aggression and neutral condition of this study along with the results in the aggression condition from Hsiao et al.’s (2011) study to provide additional benchmark for comparison.
Table 4.5

*Means and Standard Deviations of the R-PAS Variables across Conditions*

<table>
<thead>
<tr>
<th>R-PAS Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
<th>Total (n = 207)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>AGC</td>
<td>3.42</td>
<td>2.12</td>
<td>3.59</td>
<td>2.20</td>
</tr>
<tr>
<td>AGM</td>
<td>0.71</td>
<td>1.10</td>
<td>0.53</td>
<td>0.79</td>
</tr>
<tr>
<td>MAP</td>
<td>0.49</td>
<td>0.76</td>
<td>0.41</td>
<td>0.61</td>
</tr>
<tr>
<td>MOR</td>
<td>1.16</td>
<td>1.39</td>
<td>0.91</td>
<td>1.13</td>
</tr>
<tr>
<td>COP</td>
<td>0.68</td>
<td>1.01</td>
<td>0.80</td>
<td>1.01</td>
</tr>
<tr>
<td>MAH</td>
<td>0.43</td>
<td>0.76</td>
<td>0.52</td>
<td>0.66</td>
</tr>
<tr>
<td>CCI%</td>
<td>17.82</td>
<td>13.53</td>
<td>16.49</td>
<td>13.08</td>
</tr>
</tbody>
</table>

Table 4.6


<table>
<thead>
<tr>
<th>R-PAS Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Hsiao et al.’s (2011) Aggression (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>AGC</td>
<td>3.42</td>
<td>2.12</td>
<td>3.59</td>
</tr>
<tr>
<td>AGM</td>
<td>0.71</td>
<td>1.10</td>
<td>0.53</td>
</tr>
<tr>
<td>MAP</td>
<td>0.49</td>
<td>0.76</td>
<td>0.41</td>
</tr>
<tr>
<td>MOR</td>
<td>1.16</td>
<td>1.39</td>
<td>0.91</td>
</tr>
<tr>
<td>COP</td>
<td>0.68</td>
<td>1.01</td>
<td>0.80</td>
</tr>
<tr>
<td>MAH</td>
<td>0.43</td>
<td>0.76</td>
<td>0.52</td>
</tr>
<tr>
<td>CCI%</td>
<td>17.82</td>
<td>13.53</td>
<td>16.49</td>
</tr>
</tbody>
</table>

Results of research question and hypotheses 2. According to research hypotheses 2, it was expected that participants in the aggression condition would show elevated scores on AGC, AGM, MAP, MOR, and CCI% when compared to the neutral condition. Participants in the love condition would show elevated scores on COP and MAH when compared to the neutral condition. Such a pattern would then reflect the validity that these Rorschach codes could capture the induced target cognitive-affective...
mindsets. The results of the independent $t$-tests of the R-PAS variables across three conditions are presented below to test research hypotheses 2.

**Independent $t$-tests of the selected R-PAS codes across three conditions.**

Independent $t$-tests of the R-PAS variables were conducted to compare the mean differences between the aggression and neutral, love and neutral, and aggression and love conditions. Table 4.7 displayed the results of these analyses. The results did not support the hypotheses, which were based on the previous results found in Hsiao et al.’s (2011) study.

<table>
<thead>
<tr>
<th>R-PAS Variables</th>
<th>Aggression vs. Neutral ($df = 133$)</th>
<th>Love vs. Neutral ($df = 136$)</th>
<th>Aggression vs. Love ($df = 139$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$t$</td>
<td>$p$</td>
<td>$d$</td>
</tr>
<tr>
<td>AGC</td>
<td>-0.46</td>
<td>0.65</td>
<td>-0.08</td>
</tr>
<tr>
<td>AGM</td>
<td>1.09</td>
<td>0.28</td>
<td>0.19</td>
</tr>
<tr>
<td>MAP</td>
<td>0.70</td>
<td>0.48</td>
<td>0.12</td>
</tr>
<tr>
<td>MOR</td>
<td>1.14</td>
<td>0.25</td>
<td>0.20</td>
</tr>
<tr>
<td>COP</td>
<td>-0.70</td>
<td>0.48</td>
<td>-0.12</td>
</tr>
<tr>
<td>MAH</td>
<td>-0.66</td>
<td>0.51</td>
<td>-0.13</td>
</tr>
<tr>
<td>CCI%</td>
<td>0.58</td>
<td>0.56</td>
<td>0.10</td>
</tr>
</tbody>
</table>

*Note.* Bold font indicates $p < .05$ and the corresponding Cohen’s $d$ value. To facilitate interpretation, positive $d$ values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.
The Single Category Implicit Association Test (SC-IAT).

**Descriptive statistics of the SC-IAT.** Table 4.8 lists the means and standard deviations of the SC-IAT variables in the aggression, control, and love conditions, as well as the mean and standard deviation based on the total sample.

**Results of research question and hypotheses 2.** According to research hypotheses 2, it was expected that participants in the aggression condition would show elevated scores on SC-IAT D_AggSelf scale when compared to the neutral condition. Participants in the love condition would endorse elevated scores on SC-IAT D_LovSelf codes when compared to the neutral condition. Such pattern would then reflect the validity that the SC-IAT could capture the induced target cognitive-affective mindsets. The results of the independent t-tests of the SC-IAT scales across three conditions are presented below to test research hypotheses 2.

**Independent t-tests of the SC-IAT across three conditions.** The D score values for faster pairing of Love variables with Self as opposed to Aggression variables with Self had the following Ms (and SDs) across conditions: Aggression = 0.16 (0.36), Neutral = 0.12 (0.35), and Love = 0.18 (0.33). The three independent t-tests had values of 1.0 or less, with associated p values > .30 and Cohen’s d values < 0.20. Thus, the results indicated there were no statistically significant mean differences on all SC-IAT scales in each comparison between conditions. The unexpected results failed to provide further evidence supporting the rationale that the carryover effects from the experimental manipulation could be successfully captured by the SC-IAT under participants’ implicit association presentation in this study.
Table 4.8
*Means and Standard Deviations of the SC-IAT Variables across Conditions*

<table>
<thead>
<tr>
<th>SC-IAT Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
<th>Total (n = 207)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>RT_M_LovSelf</td>
<td>694.63</td>
<td>141.95</td>
<td>673.74</td>
<td>115.30</td>
</tr>
<tr>
<td>RT_M_AggSelf</td>
<td>732.92</td>
<td>152.26</td>
<td>699.18</td>
<td>117.77</td>
</tr>
<tr>
<td>RT_SD_Correct</td>
<td>254.53</td>
<td>132.63</td>
<td>232.11</td>
<td>117.15</td>
</tr>
<tr>
<td>D_LovSelf</td>
<td>0.16</td>
<td>0.36</td>
<td>0.12</td>
<td>0.35</td>
</tr>
<tr>
<td>D_AggSelf</td>
<td>-0.16</td>
<td>0.36</td>
<td>-0.12</td>
<td>0.35</td>
</tr>
</tbody>
</table>
Additional Analyses

It was surprising that hypothesis 1 was generally supported for the PFQ but hypothesis 2 was not for the SC-IAT scales and the R-PAS variables. Current results from the selected R-PAS variables contradicted the findings from the previous study conducted by Hsiao et al. (2011, 2012), especially for the aggression condition, in which exactly the same film clip was utilized to induce the aggressive-hostile cognitive-affective mindsets among participants. Without significant results from hypothesis 2, the planned focused-contrast ANOVA on the Rorschach variables and SC-IAT scales and the regression analyses for testing the supplemental hypothesis 3 were deferred at this point. Instead, this researcher reviewed the methodology in this study and compared the difference between this study and Hsiao et al.’s (2011, 2012) study to sort out potential factors that may contribute to the discrepant results. One of the major differences in this study was that the SC-IAT was administered between the Rorschach Response Phase and Clarification Phase. It was suspected that task might have diluted the carryover effect from the films and led to the negative results. When completing the SC-IAT, participants were presented with a mixed set of pictures related to aggression and love that had to be classified in relation to the self. Thus, it is possible that psychological repairing effects were generated during this process to counter balance or offset the impact from the film, which would then affect participants’ responses to the Rorschach task during the Clarification Phase. To address this potential confounding factor, this researcher coded the selected R-PAS variables based on the information contained in the Response Phase only and then re-conducted the analyses for hypothesis 2.
Coding the selected R-PAS variables based on Response Phase only. During the process of coding the selected R-PAS variables based on the Response Phase only, this researcher was fully aware that some codes would be more likely to be scored during the Response Phase as long as the individual words or phrases that matched the concepts of those codes were mentioned. However, other codes would be less likely to be scored during the Response Phase because their coding thresholds require more comprehensive sentences to depict the meanings that indicate the interpersonally related interactions. For example, Bl would be coded as long as the participants mentioned the word blood in the Response Phase, and thus would contribute to the score on CCI% variable. AGC would be coded as long as the participants mentioned the objects, organisms, animal parts, or environmental forces that were above the thresholds for AGC. However, to score COP would require the participants to describe that they saw two objects involved in collaborative actions with each other, such as two girls holding a pot in the middle and trying to lift it together. Such descriptions were more likely to be found during the Clarification Phase, as participants were encouraged to provide further elaboration as the main task during this stage of the Rorschach administration. Thus, it was expected that the base rate of certain interpersonally related Thematic codes, such as AGM, MAP, COP, or MAH, would be reduced to even lower levels than other Thematic codes or the Critical Content codes, such as AGC, MOR, An, Bl, Sx, Ex, or Fi, when coding based on the Response Phase only. It was of course also expected that the base rate for even the latter codes would be lower using verbalizations from just the Response Phase.

Pleasant and Colorful Content codes (PCC, Hsiao & Meyer, 2015). In addition to the anticipated low base rate for all codes, the current selection of R-PAS codes favor
capturing the carryover effect from the aggression condition more than the love condition as 5 out of the 7 selected R-PAS codes were associated with the aggressive-hostile related concepts (AGC, AGM, MAP, MOR, and CCI%) and only 2 out of the 7 selected R-PAS codes were associated with the communion-love related concepts (COP and MAH). Furthermore, there are not other R-PAS variables available to code contents that may be associated with pleasant and positive concepts. One potential variable that could be considered is the color determinant, which is coded when the inkblot colors are described as contributing to a perception and is thought to reflect openness or receptivity to environmental stimuli. However, if the participants described their responses containing colorful experiences or concepts, such contents are not captured in current R-PAS codes due to the lack of colorful related content codes. The appearance of such phenomena was frequently observed by this researcher when reviewing the participants’ responses during the Response Phase only (this was done while blind to condition). To provide a more comprehensive understanding of the potential carryover effect from the love condition in this study, this researcher and Dr. Gregory Meyer created the Pleasant and Colorful Content (PCC) codes specifically for this study. Appendix F lists the guideline scoring criteria for each category in PCC, along with examples that were collected from this study. Category I of PCC focuses on scoring responses containing pleasant contents (Pleasant). Category II of PCC targets coding responses indicating colorful contents (Colorful). Category III and IV of PCC differentiate how participants use the colored stimuli on the inkblots when providing their responses, with Category III classifying the traditional use of color as a determinant (SumC) and Category IV classifying the use of color to only indicate where an object is located on the inkblot (ColorLoc). This
researcher applied the scoring criteria for these categories to this study and included this newly created PCC code and its subscales in the following analyses. All coding of the protocols was done while blind to participants’ conditions in the experiment.

*Descriptive statistics of the selected R-PAS codes based on Response Phase only.* Table 4.9 presents the means and standard deviations of the selected R-PAS variables coded base on the Response Phase only in the aggression, control, and love conditions as well as for the total sample. It also provides data for the newly created Pleasant and Colorful Contents (PCC) variable and its subscales.

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
<th>Total (n = 207)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>AGC RP</td>
<td>3.57</td>
<td>2.25</td>
<td>3.14</td>
<td>2.07</td>
</tr>
<tr>
<td>AGM RP</td>
<td>0.54</td>
<td>0.81</td>
<td>0.45</td>
<td>0.71</td>
</tr>
<tr>
<td>MAP RP</td>
<td>0.38</td>
<td>0.82</td>
<td>0.42</td>
<td>0.79</td>
</tr>
<tr>
<td>MOR RP</td>
<td>0.99</td>
<td>1.24</td>
<td>1.00</td>
<td>1.25</td>
</tr>
<tr>
<td>COP RP</td>
<td>0.80</td>
<td>1.04</td>
<td>1.00</td>
<td>1.29</td>
</tr>
<tr>
<td>MAH RP</td>
<td>0.42</td>
<td>0.72</td>
<td>0.50</td>
<td>0.71</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.83</td>
<td>1.44</td>
<td>1.89</td>
<td>1.80</td>
</tr>
<tr>
<td>Colorful</td>
<td>0.38</td>
<td>0.67</td>
<td>0.44</td>
<td>0.84</td>
</tr>
<tr>
<td>SumC</td>
<td>0.30</td>
<td>0.81</td>
<td>0.21</td>
<td>0.62</td>
</tr>
<tr>
<td>ColorLoc</td>
<td>0.04</td>
<td>0.36</td>
<td>0.12</td>
<td>0.67</td>
</tr>
<tr>
<td>PCC</td>
<td>2.55</td>
<td>1.91</td>
<td>2.67</td>
<td>2.03</td>
</tr>
</tbody>
</table>
Independent t-test of the selected R-PAS codes based on Responses Phase only

across three conditions. Independent samples t-tests were conducted to compare the mean differences between the aggression and neutral, love and neutral, and aggression and love conditions. Table 4.10 displays the results of these analyses. AGC RP was significantly elevated in the aggression condition when compared to the love condition.

With regard to the newly created codes, PCC was found significantly elevated in the love condition when compared to the neutral and aggression conditions. ColorLoc was also statistically elevated in the love condition when compared to the aggression condition.

Table 4.10
Independent t-Tests, p Values, and Cohen's d Values of the R-PAS Variables (Coded Base on Response Phase Only) between Conditions

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Aggression vs. Neutral (df = 133)</th>
<th>Love vs. Neutral (df = 136)</th>
<th>Aggression vs. Love (df = 139)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>d</td>
</tr>
<tr>
<td>AGC RP</td>
<td>1.15</td>
<td>0.25</td>
<td>0.20</td>
</tr>
<tr>
<td>AGM RP</td>
<td>0.62</td>
<td>0.54</td>
<td>0.11</td>
</tr>
<tr>
<td>MAP RP</td>
<td>-0.34</td>
<td>0.73</td>
<td>-0.06</td>
</tr>
<tr>
<td>MOR RP</td>
<td>-0.07</td>
<td>0.95</td>
<td>-0.01</td>
</tr>
<tr>
<td>COP RP</td>
<td>-1.01</td>
<td>0.31</td>
<td>-0.18</td>
</tr>
<tr>
<td>MAH RP</td>
<td>-0.65</td>
<td>0.52</td>
<td>-0.11</td>
</tr>
<tr>
<td>CCI% RP</td>
<td>0.32</td>
<td>0.75</td>
<td>0.06</td>
</tr>
<tr>
<td>Pleasant</td>
<td>-0.24</td>
<td>0.81</td>
<td>-0.04</td>
</tr>
<tr>
<td>Colorful</td>
<td>-0.48</td>
<td>0.63</td>
<td>-0.08</td>
</tr>
<tr>
<td>SumC</td>
<td>0.74</td>
<td>0.46</td>
<td>0.13</td>
</tr>
<tr>
<td>ColorLoc</td>
<td>-0.85</td>
<td>0.40</td>
<td>-0.15</td>
</tr>
<tr>
<td>PCC</td>
<td>-0.34</td>
<td>0.73</td>
<td>-0.06</td>
</tr>
</tbody>
</table>

Note. Bold font indicates p < .05 and the corresponding Cohen’s d value. To facilitate interpretation, positive d values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.
Additional results of research question and hypotheses 2a and 2b. To continue testing the research question and hypotheses 2a and 2b on the R-PAS RP variables, the focused-contrast ANOVA was applied to the aggressive-hostile related variables (AGC RP, AGM RP, MAP RP, MOR RP, and CCI% RP), with the expectation that the direction of the means on these codes would be the highest in the aggression condition (assigned contrast weight as 1), moderate in the neutral condition (assigned contrast weight as 0), and the lowest in the love condition (assigned contrast weight as -1). On the other hand, hypothesis 2b was directly addressed by the focused-contrast ANOVA to the communion-love related variables on selected R-PAS RP codes (COP RP, MAH RP, Pleasant, Colorful, SumC, ColorLoc, and PCC), with the expectation that the direction of the means on these codes would be the highest in the love condition (assigned contrast weight as 1), moderate in the neutral condition (assigned contrast weight as 0), and the lowest in the aggression condition (assigned contrast weight as -1). If such patterns were significant, it would provide additional evidence to support the validity of these codes in capturing the carryover effects from the films. Table 4.11 summarizes the results of the focused-contrast ANOVA and Figure 4.1 to Figure 4.4 presents the results of the codes that were significant in graphic form for easier comprehension. As summarized in Table 4.11, AGC RP and AGM RP were the two variables that demonstrated statistically significant differences indicating the expected pattern of the highest means in the aggression condition, moderate means in the neutral condition, and lowest means in the love condition, which supports hypothesis 2a. Additionally, ColorLoc and PCC demonstrated statistically significant differences indicating the expected pattern of the highest means in the love condition, moderate
means in the neutral condition, and lowest means in the aggression condition, which supports hypothesis 2b.
<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Aggression Hypothesis-Testing Groups</th>
<th>Love = -1, Neutral = 0, Aggression = 1</th>
<th>(df = 1, 204)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC RP</td>
<td>7.71</td>
<td>0.01</td>
<td>0.19</td>
</tr>
<tr>
<td>AGM RP</td>
<td>4.12</td>
<td>0.04</td>
<td>0.14</td>
</tr>
<tr>
<td>MAP RP</td>
<td>1.92</td>
<td>0.17</td>
<td>0.10</td>
</tr>
<tr>
<td>MOR RP</td>
<td>1.95</td>
<td>0.17</td>
<td>0.10</td>
</tr>
<tr>
<td>CCI% RP</td>
<td>1.22</td>
<td>0.27</td>
<td>0.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Love Hypothesis-Testing Groups</th>
<th>Aggression = -1, Neutral = 0, Love = 1</th>
<th>(df = 1, 204)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COP RP</td>
<td>3.46</td>
<td>0.06</td>
<td>0.13</td>
</tr>
<tr>
<td>MAH RP</td>
<td>0.33</td>
<td>0.57</td>
<td>0.04</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.87</td>
<td>0.17</td>
<td>0.10</td>
</tr>
<tr>
<td>Colorful</td>
<td>0.37</td>
<td>0.55</td>
<td>0.04</td>
</tr>
<tr>
<td>SumC</td>
<td>0.01</td>
<td>0.90</td>
<td>0.01</td>
</tr>
<tr>
<td>ColorLoc</td>
<td>7.78</td>
<td>0.01</td>
<td>0.19</td>
</tr>
<tr>
<td>PCC</td>
<td>7.02</td>
<td>0.01</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*Note.* Bold font indicates $p < .05$ and the corresponding Pearson’s $r$ value. To facilitate interpretation, positive $r$ values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.
Figure 4.1. Focused-Contrast ANOVA on AGM RP with Aggression Hypothesis-Testing Groups.

Figure 4.2. Focused-Contrast ANOVA on AGC RP with Aggression Hypothesis-Testing Groups.
Figure 4.3. Focused-Contrast ANOVA on ColorLoc with Love Hypothesis-Testing Groups.

Figure 4.4. Focused-Contrast ANOVA on PCC with Love Hypothesis-Testing Groups.
Results of supplemental research question and hypotheses 3a and 3b.

Research question 3 was intended to address whether or not participants’ general explicit interpersonal characteristics and the level of implicit cognitive-affective mindsets on aggression prior to watching the film clips in the experimental conditions would have potential additive effects in helping participants tune into the films better than others and then produce more of the corresponding aggression-hostile or communion-love codes on the Rorschach. To test hypotheses 3a and 3b, only the R-PAS RP variables that had been statistically significant in the focused-contrast ANOVAs were considered (AGC RP, AGM RP, ColorLoc, and PCC). Therefore, the condition dimension of love < neutral < aggression and the aggression-hostility dimension generated from the IPQ and CRT-A were used as two predictors in regressions predicting the R-PAS RP variables associated with aggression-hostility concepts (AGC RP, and AGM RP) and the condition dimension of aggression < neutral < love and the communion-love dimension generated from the IPQ and CRT-A were used as another two predictors in regressions predicting the R-PAS RP variables associated with communion-love concepts (ColorLoc and PCC).

Regression analysis of AGC RP and AGM RP with condition and aggression-hostility dimensions as predictors. Table 4.12 summarized the results of the regression analyses testing hypothesis 3a for the two DVs showing significant effects by condition, AGC RP and AGM RP. Unfortunately, the results indicated that the second predictor, the Aggression-Hostility dimension, did not contribute to a significant change in the $F$ value ($p$ value of $\Delta F$, ns), thus, failing to support hypothesis 3a. Baseline personality characteristics did not help contribute to the prediction of score elevations.
Hierarchical Regression Analyses Predicting the R-PAS RP Variables from Aggression Condition Dimension and Aggression-Hostility Dimension (n = 206)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>AGC RP</th>
<th>AGM RP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td>β Result</td>
<td>β Result</td>
<td>β Result</td>
</tr>
<tr>
<td>Aggression Condition Dimension</td>
<td>0.19</td>
<td>0.19</td>
</tr>
<tr>
<td>Aggression-Hostility Dimension</td>
<td></td>
<td>-0.05</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>$F$</td>
<td>7.76</td>
<td>4.14</td>
</tr>
<tr>
<td>$p$ value of $F$</td>
<td><strong>0.01</strong></td>
<td><strong>0.02</strong></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\Delta F$</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>$p$ value of $\Delta F$</td>
<td>0.46</td>
<td></td>
</tr>
</tbody>
</table>

Note: Bold font indicates $p < .05$.

Regression analysis of ColorLoc and PCC with condition and communion–love dimensions as predictors. Hierarchical regression analyses were applied by using the Love Condition dimension as the first predictor and the Communion-Love Dimension as the second predictor to examine whether the second predictor would contribute additional significant changes on the results of ColorLoc and PCC. Table 4.16 summarized the results of the regression analyses testing the hypothesis 3b. Unfortunately, the results indicated that the second predictor, the Communion-Love Dimension, did not contribute to significant change in the F value ($p$ value of $\Delta F$, ns), thus, failing to support hypothesis 3b as well. Baseline personality characteristics did not help contribute to the prediction of score elevations.
Table 4.13
Hierarchical Regression Analyses Predicting the R-PAS RP Variables from Love Condition Dimension and Communion-Love Dimension (n = 206)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>ColorLoc</th>
<th></th>
<th></th>
<th>PCC</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 1</td>
<td>Model 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>Result</td>
<td>β</td>
<td>Result</td>
<td>β</td>
<td>Result</td>
</tr>
<tr>
<td>Love Condition Dimension</td>
<td>0.19</td>
<td>0.19</td>
<td>0.18</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communion-Love Dimension</td>
<td>-0.04</td>
<td></td>
<td></td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                  |          |           |           |           |           |           |
|                  | $R^2$    | 0.04      | 0.04      | 0.03      | 0.04      |           |
|                  | $F$      | 7.85      | 4.10      | 7.09      | 4.56      |           |
|                  | $p$ value of $F$ | **0.01** | **0.02** | **0.01** | **0.01** |           |
|                  | $\Delta R^2$ | <0.01    |           |           | 0.01      |           |
|                  | $\Delta F$ | 0.38      |           |           | 2.00      |           |
|                  | $p$ value of $\Delta F$ | 0.54    |           |           | 0.16      |           |

*Note.* Bold font indicates $p < .05$.

**Results of analyses with gender differences as an effect.** According to Hsiao et al. (2011, 2012), gender had significant effects on reactions to the films in that study, especially for the aggression condition. Specifically, male participants experienced the 300 film as less sad, more entertaining, and more exciting than female participants. Such differences in experience were also reflected on Rorschach scores in Hsiao et al.’s (2011, 2012) study, as AGC had the highest mean for males in the aggression condition and the lowest mean for females in the loss condition. Given that this study employed the same experimental procedure and utilized the same film in the aggression condition, it was worth exploring whether gender would continue to be an effect in this study. To explore this, descriptive statistics and independent $t$-tests for males and females on PFQ and Rorschach in each condition were reviewed. Then, ANOVAs were run on the PFQ and R-PAS RP variables to examine the effects on gender and condition. Finally, focused-
contrast ANOVAs were used with the R-PAS RP variables that had significant gender and condition effects in order to test the hypothesized pattern between gender and condition.

**Descriptive statistics and independent t-tests of the PFQ by gender across three conditions.** The PFQ was employed in this study to measure the carryover effects from the films in the aggression and love condition. For the two experimental conditions, the PFQ was administered right after the Rorschach Response Phase to assess the participants’ self-perceived impact from the films. For the neutral condition, because no film was watched, the PFQ was administered right after the Rorschach Response Phase to assess the participants’ self-perceived general emotional state during the time between their arrival to the computer lab and the beginning of the experiment. Initial review of Table 4.2 previously indicated that the Hostility and Sadness scales were higher in the current study than in Hsiao et al.’s (2011). Further review of the PFQ items suggested that Hostility can be classified into two subscales, Hostile-Affect (anger, hostile, and irritable) and Hostile-Revulsion (scornful, disgusted, and loathing), to represent more fine-grained emotional reactions (See Appendix C). Thus, these two subscales were computed for the following analyses. It was expected that the gender effect would be more significant in the aggression and love conditions than the neutral condition. Table 4.14 displays the means and standard deviations of the PFQ variables by gender within each condition and Table 4.15 provides the results of the independent t-tests to directly evaluate the gender effect. As expected, males endorsed significantly more Self-Assurance, Joviality, Joviality-Valence, and Joviality-Arousal than females in the aggression condition, suggesting that males reacted to the film in a more positive manner.
than females. At the same time, females perceived the film in the aggression condition in a more negative manner than males, as females endorsed significantly more Hostility, Hostile-Revulsion, and Sadness. Moreover, the results also indicated that there were no gender effects in the control condition and the only gender effect found in the love condition was that females experienced the film as more sad than males. Overall, the results from the PFQ indicated that gender was clearly more of an effect in the aggression condition than the neutral and love conditions, which was consistent with the initial expectations.

Table 4.14
Means and Standard Deviations of the PFQ Variables by Gender within Each Condition

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n = 31)</td>
<td>Female (n = 38)</td>
<td>Male (n = 27)</td>
</tr>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
</tr>
<tr>
<td>Hostility</td>
<td>11.35 3.93</td>
<td>15.03 5.08</td>
<td>8.44 3.37</td>
</tr>
<tr>
<td>Hostile-Affect</td>
<td>2.16 0.86</td>
<td>2.54 0.96</td>
<td>1.48 0.66</td>
</tr>
<tr>
<td>Hostile-Revulsion</td>
<td>1.62 0.58</td>
<td>2.47 0.94</td>
<td>1.33 0.55</td>
</tr>
<tr>
<td>Sadness</td>
<td>7.10 2.96</td>
<td>10.87 4.55</td>
<td>7.74 3.30</td>
</tr>
<tr>
<td>Self-Assurance(^1)</td>
<td>21.10 7.81</td>
<td>15.74 7.53</td>
<td>16.04 6.05</td>
</tr>
<tr>
<td>Joviality</td>
<td>22.90 8.11</td>
<td>16.08 7.94</td>
<td>21.89 8.40</td>
</tr>
<tr>
<td>Joviality-Valence(^1)</td>
<td>9.00 4.43</td>
<td>6.55 3.77</td>
<td>10.85 4.24</td>
</tr>
<tr>
<td>Joviality-Arousal(^1)</td>
<td>13.90 4.50</td>
<td>9.53 5.14</td>
<td>11.04 4.40</td>
</tr>
<tr>
<td>Communion</td>
<td>18.74 7.96</td>
<td>18.92 8.12</td>
<td>25.96 8.81</td>
</tr>
<tr>
<td>Communion-Providing(^1)</td>
<td>9.03 4.27</td>
<td>9.92 4.93</td>
<td>12.78 4.96</td>
</tr>
<tr>
<td>Communion-Receiving(^1)</td>
<td>9.71 4.03</td>
<td>9.00 3.66</td>
<td>13.19 4.35</td>
</tr>
</tbody>
</table>

\(^1\) PFQ variables that were listed in hypotheses.
Table 4.1
Independent t-Tests, p Values, and Cohen's d Values of the PFQ Variables by Gender Comparison within Each Condition

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male vs. Female (df = 67)</td>
<td>Male vs. Female (df = 64)</td>
<td>Male vs. Female (df = 70)</td>
</tr>
<tr>
<td>Hostility</td>
<td>-3.30 *&lt;0.01 -0.81</td>
<td>-0.82 0.41 -0.21</td>
<td>1.28 0.20 0.31</td>
</tr>
<tr>
<td>Hostile-Affect</td>
<td>-1.68 0.10 -0.41</td>
<td>-0.99 0.33 -0.25</td>
<td>0.90 0.37 0.22</td>
</tr>
<tr>
<td>Hostile-Revulsion</td>
<td>-4.41 *&lt;0.01 -1.08</td>
<td>-0.53 0.60 -0.13</td>
<td>1.20 0.23 0.29</td>
</tr>
<tr>
<td>Sadness</td>
<td>-3.98 *&lt;0.01 -0.98</td>
<td>-0.96 0.34 -0.24</td>
<td><strong>-2.73 0.01 -0.67</strong></td>
</tr>
<tr>
<td>Self-Assurance¹</td>
<td><strong>2.89 0.01 0.71</strong></td>
<td>1.89 0.06 0.48</td>
<td>0.80 0.42 0.20</td>
</tr>
<tr>
<td>Joviality</td>
<td>*<em>3.52 <em>&lt;0.01 0.86</em></em></td>
<td>0.98 0.33 0.25</td>
<td>0.18 0.86 0.04</td>
</tr>
<tr>
<td>Joviality-Valence¹</td>
<td><strong>2.48 0.02 0.61</strong></td>
<td>0.73 0.47 0.18</td>
<td>-0.38 0.71 -0.09</td>
</tr>
<tr>
<td>Joviality-Arousal¹</td>
<td>*<em>3.72 <em>&lt;0.01 0.91</em></em></td>
<td>1.18 0.24 0.30</td>
<td>0.71 0.48 0.17</td>
</tr>
<tr>
<td>Communion</td>
<td>-0.09 0.93 -0.02</td>
<td>0.64 0.52 0.16</td>
<td>-0.95 0.35 -0.23</td>
</tr>
<tr>
<td>Communion-Providing¹</td>
<td>-0.79 0.43 -0.19</td>
<td>0.38 0.71 0.10</td>
<td>-1.03 0.31 -0.25</td>
</tr>
<tr>
<td>Communion-Receiving¹</td>
<td>0.77 0.45 0.19</td>
<td>0.89 0.38 0.23</td>
<td>-0.78 0.44 -0.19</td>
</tr>
</tbody>
</table>

*Note.* Bold font indicates p < .05 and the corresponding Cohen’s d value. To facilitate interpretation, positive d values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.

¹ PFQ variables that were listed in hypotheses.
Descriptive statistics and independent t-tests of the selected R-PAS codes based on Response Phase only by gender across three conditions. The evaluation of the gender effect on the Rorschach was conducted for R-PAS codes that were based on Response Phase only. The previous study (Hsiao et al., 2011) documented a film-based gender effect on AGC. Thus, it was expected that such results could be replicated in this study. Table 4.16 and 4.17 present the results based on the R-PAS RP codes. Review of Table 4.17 indicated that a gender effect was found for AGC RP (male > female) in both the aggression and love conditions. Current results are consistent with the previous finding reported for the PFQ (see Table 4.15), supporting the rational that males seemed to absorb the film clip in the aggression condition better than females and the carryover effect from this film was captured by the AGC RP code on the Rorschach.
Table 4.16
Means and Standard Deviations of the P-PAS Variables (Coded Based on Response Phase Only) by Gender within Each Condition

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n = 31)</td>
<td>Female (n = 38)</td>
<td>Male (n = 27)</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>AGC RP</td>
<td>4.19</td>
<td>2.64</td>
<td>3.05</td>
</tr>
<tr>
<td>AGM RP</td>
<td>0.48</td>
<td>0.77</td>
<td>0.58</td>
</tr>
<tr>
<td>MAP RP</td>
<td>0.32</td>
<td>0.70</td>
<td>0.42</td>
</tr>
<tr>
<td>MOR RP</td>
<td>0.94</td>
<td>1.29</td>
<td>1.03</td>
</tr>
<tr>
<td>COP RP</td>
<td>0.68</td>
<td>0.94</td>
<td>0.89</td>
</tr>
<tr>
<td>MAH RP</td>
<td>0.35</td>
<td>0.61</td>
<td>0.47</td>
</tr>
<tr>
<td>CCI% RP</td>
<td>15.15</td>
<td>11.73</td>
<td>15.32</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.94</td>
<td>1.55</td>
<td>1.74</td>
</tr>
<tr>
<td>Colorful</td>
<td>0.45</td>
<td>0.72</td>
<td>0.32</td>
</tr>
<tr>
<td>SumC</td>
<td>0.23</td>
<td>0.62</td>
<td>0.37</td>
</tr>
<tr>
<td>ColorLoc</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>0.08</td>
</tr>
<tr>
<td>PCC</td>
<td>2.61</td>
<td>2.17</td>
<td>2.50</td>
</tr>
</tbody>
</table>

135
### Table 4.17

*Independent t-Tests, p Values, and Cohen's d Values of the R-PAS Variables (Coded Base on Response Phase Only) by Gender Comparison within Each Condition*

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Aggression (n = 69)</th>
<th>Neutral (n = 66)</th>
<th>Love (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male vs. Female (<em>df</em> = 67)</td>
<td>Male vs. Female (<em>df</em> = 64)</td>
<td>Male vs. Female (<em>df</em> = 70)</td>
</tr>
<tr>
<td></td>
<td><em>t</em></td>
<td><em>p</em></td>
<td><em>d</em></td>
</tr>
<tr>
<td>AGC RP</td>
<td>2.15</td>
<td>0.03</td>
<td>0.53</td>
</tr>
<tr>
<td>AGM RP</td>
<td>-0.48</td>
<td>0.63</td>
<td>-0.12</td>
</tr>
<tr>
<td>MAP RP</td>
<td>-0.49</td>
<td>0.63</td>
<td>-0.12</td>
</tr>
<tr>
<td>MOR RP</td>
<td>-0.30</td>
<td>0.77</td>
<td>-0.07</td>
</tr>
<tr>
<td>COP RP</td>
<td>-0.86</td>
<td>0.39</td>
<td>-0.21</td>
</tr>
<tr>
<td>MAH RP</td>
<td>-0.68</td>
<td>0.50</td>
<td>-0.17</td>
</tr>
<tr>
<td>CCI% RP</td>
<td>-0.06</td>
<td>0.95</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

Note. Bold font indicates *p* < .05 and the corresponding Cohen’s *d* value. To facilitate interpretation, positive *d* values indicate the first condition was higher than the second; negative values indicate the first condition was lower than the second.
Exploration of the gender, condition, and gender by condition effects through ANOVA analyses. The previous analyses focused on gender differences within conditions and so were relatively underpowered to detect effects. They also did not examine the combined impact of gender considered across all three conditions. Consequently, a series of 2 x 3 factorial ANOVAs were implemented with the PFQ and R-PAS RP variables that were significant in previous analyses. In addition, focused-contrast ANOVAs were conducted to test the directional hypotheses on gender and condition for the PFQ and R-PAS variables that had effects for both gender and condition.

2 x 3 factorial ANOVA analyses of the PFQ. Table 4.18 summarizes the results from the factorial ANOVAs of the PFQ. In addition, Figures 4.5 to Figure 4.15 provide visual aids to better comprehend these effects. As indicated in Table 4.18, almost all of the PFQ variables show an experimental condition effect (except Joviality). Moreover, Hostility, Hostile-Revulsion, and Jovial-Arousal were the three variables showing an interaction of gender by condition. The results indicated that females showed higher Hostility in the aggression condition than males (See Figure 4.5). This effect was mainly determined by a significant elevation on the Hostile-Revulsion scale for females in the aggression condition (See Figure 4.7). With regard to Jovial-Arousal, males were significantly more elevated than females in the aggression condition (See Figure 4.12). Another interesting finding was that females were significantly elevated on Sadness in both the aggression and love conditions (See Figure 4.8) while males demonstrated higher Self-Assurance in the aggression condition (See Figure 4.9).
Table 4.18
2x3 Factorial ANOVA of the PFQ on Gender and Experimental Condition

<table>
<thead>
<tr>
<th>PFQ Variables</th>
<th>Gender Effect (M vs. F)</th>
<th>Condition Effect (df = 2, 203)</th>
<th>Gender x Condition Effect (df = 2, 201)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>r</td>
</tr>
<tr>
<td>Hostility</td>
<td>-2.45</td>
<td>0.02</td>
<td>0.17</td>
</tr>
<tr>
<td>Hostile-Affect</td>
<td>-1.53</td>
<td>0.13</td>
<td>0.11</td>
</tr>
<tr>
<td>Hostile-Revulsion</td>
<td>-2.96</td>
<td>&lt;0.01</td>
<td>0.21</td>
</tr>
<tr>
<td>Sadness</td>
<td>-4.35</td>
<td>&lt;0.01</td>
<td>0.29</td>
</tr>
<tr>
<td>Self-Assurance</td>
<td>3.40</td>
<td>&lt;0.01</td>
<td>0.23</td>
</tr>
<tr>
<td>Joviality</td>
<td>2.63</td>
<td>0.01</td>
<td>0.18</td>
</tr>
<tr>
<td>Joviality-Valence</td>
<td>1.58</td>
<td>0.12</td>
<td>0.11</td>
</tr>
<tr>
<td>Joviality-Arousal</td>
<td>3.33</td>
<td>&lt;0.01</td>
<td>0.23</td>
</tr>
<tr>
<td>Communion</td>
<td>-0.24</td>
<td>0.81</td>
<td>0.02</td>
</tr>
<tr>
<td>Communion-Providing</td>
<td>-0.78</td>
<td>0.44</td>
<td>0.05</td>
</tr>
<tr>
<td>Communion-Receiving</td>
<td>-0.36</td>
<td>0.72</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note. Bold font indicates \( p < .05 \) and the corresponding effect size (\( r \) value). To facilitate interpretation, positive \( t \) values in the Gender effect indicate Male higher than Female and vice versa; positive \( F \) values in the Condition effect indicate higher means in Aggression relative to Love and vice versa.

\(^1\) PFQ variables that were listed in hypotheses.
Figure 4.5. 2x3 Factorial ANOVA on Hostility with Significant Effects of Gender, Condition, and Gender by Condition.

Figure 4.6. 2x3 Factorial ANOVA on Hostile-Affect with Significant Effect of Condition.
Figure 4.7. 2x3 Factorial ANOVA on Hostile-Revulsion with Significant Effects of Gender, Condition, and Gender by Condition.

Figure 4.8. 2x3 Factorial ANOVA on Sadness with Significant Effects of Gender and Condition.
Figure 4.9. 2x3 Factorial ANOVA on Self-Assurance with Significant Effects of Gender and Condition.

Figure 4.10. 2x3 Factorial ANOVA on Joviality with Significant Effect of Gender.
Figure 4.11. 2x3 Factorial ANOVA on Joviality-Valence with Significant Effect of Condition.

Figure 4.12. 2x3 Factorial ANOVA on Joviality-Arousal with Significant Effects of Gender, Condition, and Gender by Condition.
Figure 4.13. 2x3 Factorial ANOVA on Communion with Significant Effect of Condition.

Figure 4.14. 2x3 Factorial ANOVA on Communion-Providing with Significant Effect of Condition.
Figure 4.15. 2x3 Factorial ANOVA on Communion-Receiving with Significant Effects of Condition.
2 X 3 factorial ANOVA analyses of the selected R-PAS codes based on Response Phase only. Table 4.19 summarizes the results from the factorial ANOVAs of the selected R-PAS RP codes. In addition, Figures 4.16 to Figure 4.21 provided visual aids for the codes that demonstrated significant effects to better comprehend the results. As indicated in Table 4.19, AGC RP was the only code that showed both significant effects on gender and experimental condition. However, the interaction effect was not observed (also see Figure 4.16). Experimental condition contributed to the elevation on AGM RP codes as well, with the participants in the aggression condition displaying higher scores and participants in the love condition displaying lower scores (See Figure 4.17). To examine broader effects on the Aggression-Hostile related R-PAS codes, two composite scores were created, with one combining AGC RP and AGM RP (AGCM RP) and the other combining these two aggression markers and subtracting from that cooperative movement scores (i.e., AGC RP and AGM minus COP RP; AGCMmCOP RP). The results supported these composites, as the effect size $r$ increased from 0.19 on AGC RP to 0.26 on AGCMmCOP RP (See Table 4.19 and Figure 4.19). Finally, two out of the five newly created codes, ColorLoc and PCC, were also capable of capturing the carryover effect in the love condition (See Figure 4.20 and 4.21). The current results suggested that a proportion of the R-PAS RP codes were capable of capturing the carryover effect from the aggression and love conditions.
Table 4.19
2 x 3 Factorial ANOVA of the Selected P-PAS RP Variables on Gender and Experimental Condition

<table>
<thead>
<tr>
<th>R-PAS RP Variables</th>
<th>Gender Effect (M vs. F) (df = 1, 204)</th>
<th>Experimental Condition Effect (df = 2, 203)</th>
<th>Gender x Condition Effect (df = 2, 201)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t   p</td>
<td>r</td>
<td>F</td>
</tr>
<tr>
<td>AGC RP</td>
<td>3.34 &lt;0.01 0.23</td>
<td>7.13 0.01 0.19</td>
<td>0.11 0.90 0.02</td>
</tr>
<tr>
<td>AGM RP</td>
<td>-0.58 0.56 0.04</td>
<td>4.26 0.04 0.14</td>
<td>0.27 0.77 0.04</td>
</tr>
<tr>
<td>MAP RP</td>
<td>0.01 0.99 0.00</td>
<td>1.58 0.21 0.09</td>
<td>0.25 0.78 0.04</td>
</tr>
<tr>
<td>MOR RP</td>
<td>-0.86 0.39 0.06</td>
<td>2.35 0.13 0.11</td>
<td>0.37 0.69 0.04</td>
</tr>
<tr>
<td>COP RP</td>
<td>-1.44 0.15 0.10</td>
<td>-2.66 0.10 0.11</td>
<td>0.49 0.61 0.05</td>
</tr>
<tr>
<td>MAH RP</td>
<td>-1.08 0.28 0.08</td>
<td>-0.11 0.74 0.02</td>
<td>1.22 0.30 0.08</td>
</tr>
<tr>
<td>CCI% RP</td>
<td>0.53 0.60 0.04</td>
<td>1.03 0.31 0.07</td>
<td>0.11 0.90 0.02</td>
</tr>
<tr>
<td>AGCM RP</td>
<td>2.83 0.01 0.20</td>
<td>9.48 &lt;0.01 0.21</td>
<td>0.07 0.94 0.02</td>
</tr>
<tr>
<td>AGCMmCOP RP</td>
<td>3.42 &lt;0.01 0.23</td>
<td>14.04 &lt;0.01 0.26</td>
<td>0.10 0.91 0.02</td>
</tr>
<tr>
<td>Pleasant</td>
<td>-0.66 0.51 0.05</td>
<td>-1.14 0.29 0.08</td>
<td>1.10 0.33 0.07</td>
</tr>
<tr>
<td>Colorful</td>
<td>-0.98 0.33 0.07</td>
<td>-0.13 0.72 0.03</td>
<td>1.20 0.30 0.08</td>
</tr>
<tr>
<td>SumC</td>
<td>0.18 0.86 0.01</td>
<td>-0.08 0.78 0.02</td>
<td>0.62 0.54 0.06</td>
</tr>
<tr>
<td>ColorLoc</td>
<td>-0.29 0.77 0.02</td>
<td>-6.88 0.01 0.18</td>
<td>0.53 0.59 0.05</td>
</tr>
<tr>
<td>PCC</td>
<td>-0.94 0.35 0.07</td>
<td>-5.33 0.02 0.16</td>
<td>1.26 0.29 0.08</td>
</tr>
</tbody>
</table>

Note. Bold font indicates p < .05 and the corresponding effect size (r value). To facilitate interpretation, positive t values in the Gender effect indicate Male higher than Female and vice versa; positive F values in the Condition effect indicate higher means in Aggression relative to Love and vice versa.
Figure 4.16. 2x3 Factorial ANOVA on AGC RP with Significant Effects of Gender and Condition.

Figure 4.17. 2x3 Factorial ANOVA on AGM RP with Significant Effect of Condition.
Figure 4.18. 2x3 Factorial ANOVA on AGCM RP (AGC+AGM) with Significant Effects of Gender and Condition.

Figure 4.19. 2x3 Factorial ANOVA on AGCMmCOP RP (AGC+AGM-COP) with Significant Effects of Gender and Condition.
Figure 4.20. 2x3 Factorial ANOVA on ColorLoc with Significant Effect of Condition.

Figure 4.21. 2x3 Factorial ANOVA on PCC with Significant Effect of Condition.
Focused-contrast ANOVA analyses of the PFQ and R-PAS RP variables.

Based on the results analyzed so far, it has been observed that males and females seemed to respond to the films in the two experimental conditions quite differently on the explicit measurement level. Thus, it might potentially influence their responses on the Rorschach. To confirm this observation, two focused-contrast ANOVAs on the PFQ were conducted with the generated hypotheses to confirm such observation. First, it was hypothesized that female participants found the film in aggression more negative and less pleasant than male participants and thus created the resistant reaction toward this film while female participants found the film in the love condition more comfortable and congruent than male participants and thus generated a favorable reaction toward this film. To test this hypothesis, it was expected that the Hostile-Revulsion scores (composed of scornful, disgusted, and loathing) would be the highest for females in aggression, followed by males in aggression, about equal in the neutral condition, and then followed by males in the love condition and then females in the love condition. Thus, the focused-contrast ANOVA for the Hostile-Revulsion scale was implemented to test this pattern with the assigned weights as females in aggression = 3, males in aggression = 1, females in the neutral condition = 0, males in the neutral condition = 0, males in the love condition = -1, and females in the love condition = -3. Figure 4.2 displays the results of this focused-contrast ANOVA, including F values and effect sizes on the r metric. The results supported the observation of such a pattern in this study. Second, it was also hypothesized that male participants found the film in aggression more positive and pleasant than female participants as it depicted the traditional male characteristics such as being proud, strong, confident, bold, daring, and fearless, which were the items included
in Self-Assurance score. Thus, they may tune in to this film more congruently than the female participants in this condition. On the contrary, females may have found the film in the love condition more consistent with their gender identity as being more empathic and caring, thus immersing themselves with this film better than males. To test this hypothesis, it was expected that the Self-Assurance scores would be the highest for males in aggression, followed by females in aggression, about equal in the neutral condition, and then followed by males in the love condition and then females in the love condition. Thus, the focused-contrast ANOVA for the Self-Assurance scale was implemented to test this pattern with the assigned weights as males in aggression = 3, females in aggression = 1, females in the neutral condition = 0, males in the neutral condition = 0, males in the love condition = -1, and females in the love condition = -3. Figure 4.23 presented the result of this focused-contrast ANOVA, which supported the observation of such a pattern in this study. Third, with the previous two supported hypotheses indicating the diverse reactions to the films in the aggression and love conditions, it was expected that the AGC RP and the aggregated scores, AGCM RP and AGCMmCOP RP, would also follow the pattern of the second hypothesis, in which the score would be the highest for males in aggression, followed by females in aggression, then males in neutral, then females in neutral, then males in love, and then females in love. Figure 4.24 to 4.26 provided the results of these focused-contrast ANOVAs, all of which also supported this hypothesized patterns.
Figure 4.22. Focused-Contrast ANOVA on Hostile-Revulsion with Gender by Condition. Females in Love (n = 44) < Males in Love (n = 28) < Males in Neutral (n = 27) = Females in Neutral (n = 39) < Males in Aggression (n = 31) < Females in Aggression (n = 38), $F(1, 201) = 79.87, p < .05, r = .52$. 

Females in Love (n = 44) < Males in Love (n = 28) < Males in Neutral (n = 27) = Females in Neutral (n = 39) < Males in Aggression (n = 31) < Females in Aggression (n = 38), F (1, 201) = 79.87, p < .05, r = .52.
Figure 4.23. Focused-Contrast ANOVA on Self-Assurance with Gender by Condition. Females in Love \( (n = 44) \) < Males in Love \( (n = 28) \) < Females in Neutral \( (n = 39) \) = Males in Neutral \( (n = 27) \) < Females in Aggression \( (n = 38) \) < Males in Aggression \( (n = 31) \), \( F(1, 201) = 40.40, p < .05, r = .40 \).
Figure 4.24. Focused-Contrast ANOVA on AGC with Gender by Condition. Females in Love ($n = 44$) < Males in Love ($n = 28$) < Females in Neutral ($n = 39$) < Males in Neutral ($n = 27$) < Females in Aggression ($n = 38$) < Males in Aggression ($n = 31$), $F(1, 201) = 12.87, p < .05, r = .24$. 

$F(1, 201) = 12.87, p < .05, r = .24$. 

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Figure 4.25. Focused-Contrast ANOVA on AGCM with Gender by Condition. Females in Love (n = 44) < Males in Love (n = 28) < Females in Neutral (n = 39) < Males in Neutral (n = 27) < Females in Aggression (n = 38) < Males in Aggression (n = 31), F(1, 201) = 14.68, p < .05, r = .26.
Figure 4.26. Focused-Contrast ANOVA on AGCMmCOP RP with Gender by Condition. Females in Love (n = 44) < Males in Love (n = 28) < Females in Neutral (n = 39) < Males in Neutral (n = 27) < Females in Aggression (n = 38) < Males in Aggression (n = 31), F(1, 201) = 21.67, p < .05, r = .31.
Summary

In this Results section, multiple statistics methods were implemented to test the research hypotheses, including independent $t$-tests across conditions for the PFQ, Rorschach, and SC-IAT; focused-contrast ANOVAs for examining the experimental effects; regression analyses predicting effects from the baseline measurements (IPQ and CRT-A); 2 x 3 factorial ANOVAs to examine the gender effect, experimental condition effect, and their interaction effect; and the focused-contrast ANOVA to confirm the gender and condition effects of this study. It aimed to present comprehensive results in answering the research questions and hypotheses. The summary of this study and the discussion of the findings are presented in Chapter 5, along with the presentation of potential implications for practice, the limitation of the study, and recommendations for further research.
Chapter Five

Summary, Discussion, Implications, Limitations, Recommendations, and Conclusion

Summary of the Study

To summarize this study, chapter one reviewed the background of this study, along with the rational regarding the purpose of this study to address the current controversies on the validity of the Rorschach. Chapter two reviewed methodological issues, theoretical framework issues, and appropriate criterion selection issues to address potential validation procedures for establishing the Rorschach’s validity. The generated research questions and hypotheses were based on using the Interpersonal Circumplex as the theoretical framework, implementing a film-based mood induction procedure to induce the targeted cognitive-affective mindsets that are expected to line up with opposing poles on the Interpersonal Circumplex, and then validating selected Rorschach scores following the process-focused model with the SC-IAT as another parallel performance-based criterion measure. Chapter three documented the methodology of this study. Through power analyses, a minimum of 190 participants in total (at least 70 participants in each experimental condition and a minimum of 50 participants in the neutral condition) would be needed to reach the statistical power needed to detect the expected medium size results with a significance level set at .05. Additionally, chapter three also illustrated the procedure of how this study was carried out. Upon completion of the data collection, a total of 216 participants were recruited, with 207 valid protocols for data analyses. Chapter four then presented the actual results generated from these 207 protocols, including results from initial data analyses testing the a priori hypotheses and
results from additional data analyses exploring other factors that might potentially influence the successful production of expected results from this study.

**Discussion of the Findings**

The results started with a review of the descriptive statistics for demographic information, which showed the current sample reflects a typical college population from the mid-west region of the United State, with most participants being white and ranging in age between 18 and 20. Testing of the research questions and hypotheses began with an examination of the results from the PFQ and concluded that, overall, the experimental effects were produced successfully in both the aggression and love conditions based on participants’ explicit self-report of their conscious experience. In other words, participants generally perceived themselves as experiencing the cognitive-affective mindsets that this study intended to produce in the aggression and love conditions. The testing of the research questions and hypotheses then advanced to examine the results from the Rorschach and SC-IAT. The results were unexpected and failed to support the hypotheses 2 in general. In other words, none of the results from the Rorschach and SC-IAT captured the carryover effects from the experimental manipulation even though participants reported that they experienced such effects. Because the results contradicted the previous study conducted by Hsiao et al. (2011, 2012), tests of hypotheses 3 were deferred at that point because they would not contribute to any further understanding of the original hypothesized additive effect.

**Results from additional analyses of the experimental effect.** Additional analyses were then initiated by first examining the methodology of this study. It was suspected that the SC-IAT, which contains both positive and negative images for self-
ratings, could potentially produce an unexpected effect that influenced the participants’ reaction to or interpretation of the Rorschach during the Clarification Phase. To test this potential factor, analyses examined whether the expected experimental carryover effect might still be captured by the Rorschach during the Response Phase. Thus, the Rorschach protocols were coded again while blind to experimental condition based on the information given during the Response Phase in an attempt to re-test hypotheses 2a and 2b. During this process, the lack of existing codes to capture positive implicit experiences was observed. As a result, Pleasant and Colorful Content (PCC) codes were created to examine carryover effects from the love condition. The second round data analyses revealed some positive results in that AGC RP, AGM RP, ColorLoc, and PCC were capable of capturing the carryover effects, and thus provided an opportunity to examine hypotheses 3a and 3b on these codes. Regression analyses examined whether a combined measure of baseline implicit cognitive-affective mindsets and explicit self-rated interpersonal styles would produce additive effects alongside a contrast variable formed from the three experimental conditions when predicting which participants would have higher implicit aggressive or nurturing cognitive-affective mindset on the Rorschach. Unfortunately, the results did not support both factors; the contrast formed from the experimental conditions was a significant predictor but the composite score of baseline personality characteristics was not.

**Results from exploring gender effects with the experimental effects.** Previous results from Hsiao et al. (2011, 2012) documented gender effects as another potential factor that may impact participants’ reactions to the film clips and contribute to diverse performance on the Rorschach. In the current study, the analyses of gender differences
on the PFQ and Rorschach led to some interesting results. Simple within condition mean differences on the PFQ documented that females generally perceived the film clip in the aggression condition as negative and aversive while males generally perceived that film clip as positive and exciting. Similar simple mean differences were evident for AGC on the Rorschach with a higher mean for males in both experimental conditions. Thus, the results generally suggested that males might have absorbed the carryover effect in the aggression condition better than females, with that then reflected both in their self-perceived experience on PFQ as well as their implicit performance on Rorschach. To further evaluate the effects of gender, condition, and their interaction, a series of 2 x 3 factorial ANOVAs were completed, along with focused-contrast ANOVAs that specified an expected pattern of means by condition and gender. In general, these analyses confirmed that males and females perceived the film in the aggression condition quite differently and both genders produced differences in aggressive imagery when considered across all three conditions.

The observed mixed results on the PFQ and Rorschach are worthy of further discussion and conceptualization. It seems to this researcher that the congruence between the male figures in the film of 300 in the aggression condition and the gender identity in male participants for being assertive, strong, bold, fearless, and proud led to the expected carryover effect. Such effect were then captured and reflected in male participants’ responses to the PFQ and the Rorschach, particularly for the Aggressive Content (AGC) code. However, for female participants, the incongruence between this film and traditional gender identity in female participants for being caring, warm, sympathetic, and kind, produced an aversive effect, which was different from the original research
intention. It should be noted that with the aversive effect for females in the aggression condition, the Rorschach aggressive-hostile related variables might not be the appropriate variables to be selected for validation. However, there are no current R-PAS codes to capture aversive emotional expressions related to disgust, loathing, repulsiveness, scariness, intimidation, or general unpleasantness. Thus, aversive related variables might need to be created to capture such produced carryover effects.

Extended from this line of conceptualization, another observation from the current results is also worth further exploration. As indicated by Hsiao et al. (2011, 2012), participants who experienced difficulty tuning into an aggressive and hostile mode in the aggression condition may also have involved unconsciously activated self-regulatory or inhibition mechanisms. According to Meier, Robinson, and Wilkowski (2007), although individuals who are low in trait aggression are more likely to be vulnerable to situational influences on aggression than individuals who are high in trait aggression, individuals low in trait aggression would be aggressive only within a certain circumstances, such as being exposed to a blaming prime, but not in another circumstance, such as being exposed to an empathy prime. It appears that, for those individuals who are low in trait aggression and being exposed to an empathy prime circumstance, they may involve self-regulatory or inhibitory mechanisms to be capable of dissociating the relation between activated hostile information and aggression. Thus, in addition to creating Rorschach codes to target aversive states, it would also make sense to establish another set of codes to detect self-regulatory or inhibitory mechanisms. The current study developed components of the PCC code, Pleasant Contents (Category I) and Colorful Contents (Category II), with the intention to detect such mechanism as it was expected that these
aspects of the PCC code might be higher in the female participants watching the aggressive film. However, the current study did not provide sufficient evidence to support this rationale. Nonetheless, it could be due to the limitation of coding PCC based on the communication in Response Phase only or these elements of the PCC might not be sensitive enough to capture such mechanisms. Thus, another possible direction could be focused on developing additional R-PAS variables that may have a better mechanism to capture self-regulatory processes (e.g., immediately giving a positive response after giving a negative response) or distancing or avoidant reactions (e.g., stating “I cannot see anything” or rejecting to give responses) through either verbal expression or behavioral interactions. Having codes to capture such mechanisms may contribute to future clinical utility.

**Implications for Practice**

Based on the findings in this study, several implications could be drawn and might be useful when applied to clinical practice. These implications include the current validity for interpreting these Rorschach codes, consideration of the environmental contingencies that may potentially influence the codes, and dual process mechanisms in responding to congruent and incongruent environmental stimuli and it’s reflection on the Rorschach. Each of the implications for clinical practice is further elaborated below.

**Validity in interpretation.** In conjunction with the previous study conducted by Hsiao et al. (2011, 2012), the current study provided positive validity evidence for both the PFQ and Rorschach. For the PFQ, it continued to be observed as an appropriate and valid measure in assessing the impact of film through self-reported experience. That is, almost all of the variables were significant with the expected direction as evidenced from
the 2x3 ANOVAs and when examining the experimental condition effect by applying the focused contrast ANOVA. The effect sizes range from small on Sadness ($r = .14$) to medium on Self-Assurance ($r = .36$) and large on Hostile-Affect ($r = .55$). Interestingly, Hostility was expected to be significant in Hsiao et al.’s (2011) study, but the previous results did not support that expectation; Hostility was not higher in the Aggression condition. The current study found the opposite; that Hostility was significantly higher in the Aggression condition, particularly compared to the Love condition. Further analyses revealed that Hostility was elevated by scores on the Hostile-Revulsion subscale, based on reactions from female participants in the Aggression condition.

For the Rorschach, the focused contrast and 2x3 ANOVAs provide evidence supporting that two of the interpersonally related Thematic codes, Aggressive Content (AGC) and Aggressive Movement (AGM), were sensitive in capturing the carryover effects across all three conditions. That is, when in the aggression condition, these two codes were activated and responding to the intended experimental manipulation of an induced aggressive – hostile mindset. When in the love condition, these two codes were suppressed in reflecting the inhibition of an aggressive – hostile mindset by the induced communion – love mindset on the opposite dimension. And when in neutral condition, these two codes fall somewhere in between representing the average range of neither being activated nor being suppressed. In addition, the newly created Pleasant and Colorful Content (PCC) code and its subcategory, Color as Location (ColorLoc), were also capable of successfully capturing the film carryover effects across the three conditions as the focused contrast and 2x3 ANOVAs suggesting that these codes were activated in the love condition, suppressed in the aggression condition, and average in the
neutral condition. It should be noted that the Rorschach effects from these four codes were relatively small ($r$ ranges between .14 – .24); and the largest effect size ($r = .31$) was obtained by combining AGC with AGM and subtracting COP in a focused contract ANOVA. Perhaps these small effects were due to the result of having to limit coding to the Response Phase communication. Nonetheless, the validity of these codes provides further evidence supporting the rationale that when an examinee produces significantly elevated or decreased scores on these Content or Thematic codes, the examinee has the corresponding activated or inhibited implicit cognitive-affective mindsets. Such implications are important for clinical practice as they indicate that, when using the Rorschach as an assessment method, the significantly increased or decreased scores on these codes can be interpreted as meaningful reflections of the examinee’s implicit level of cognitive-affect mindset.

On the contrary, some negative findings from the current results are also worthy of discussion, especially for those PFQ and Rorschach variables that found support in Hsiao et al.’s (2011, 2012) study but not this time. For the PFQ, Jovial-Valence was significantly elevated in Hsiao et al.’s (2011) study when comparing the aggression and sad conditions. In the current study, Jovial-Valence was found to be in the opposite direction, as the scores were equivalent in the neutral and love conditions, but significantly lower in the aggression condition. After reviewing the M and SD in the current study and Hsiao et al’s (2011) study, it was found that the M and SD were close to equivalent in both studies within the Aggression condition. The contradictory results could be potentially due to the comparison of an aggression condition with a sad condition in the previous study versus the comparison of an aggression condition with a
love condition in current study. This makes sense as the Jovial-Valence items contain happy, joyful, delighted, and cheerful. The sad condition would inhibit and suppress participants’ experience on these emotions more than the aggression condition whereas the aggression condition would inhibit and suppress participants’ experience on these emotions more than the love condition.

For the Rorschach, Hsiao et al.’s (2011, 2012) study suggested that AGC, AGM, MOR, and CCI% were all significantly elevated in the aggression condition when compared to R-PAS norms. CCI% was also significantly elevated and MAP was close to a significant level in the aggression condition when compared to the sad condition. The significant results for MOR, CCI%, and MAP were not found in current study. It is interesting that the scores of AGC and AGM rely on identifying aggressive imagery and actions whereas the scores of MOR, CCI%, and MAP often rely on recognizing damaged images that were on the receiving end of aggressive actions or trauma related images. As indicated previously, the small effects on AGC and AGM might be due to the result of having to limit coding to the Response Phase communication. One speculative rationale to explain the lack of support for MOR and MAP in the current study might be that the identification and expression of aggressive images and actions is more likely to be experienced first and reflected in Response Phase communication, and the recognition and expression of damaged or traumatic images is more likely to be activated later and embedded in the Clarification Phase communication. Thus, when coding the Rorschach variables based on the Response Phase communication only, the significant elevation on AGC and AGM, but not on MOR, and MAP, may reflect such mental activation processes.
The lack of significant elevation on CCI% was a little bit complicated as it contains both MOR and AGM as part of the CCI%. Thus, the significant elevation on AGM might be cancelled out by the lack of elevation of MOR, leading to the non-significant results. In addition, the CCI% encompasses five other scores (An, Bl, Ex, Fi, and Sx). Although the code for blood (Bl) could reasonably be elevated in the Aggression condition, given all the blood in the 300 film, as well as suppressed in the Love condition, it is likely that the other codes addressing internal anatomy (An), explosions (Ex), fire (Fi), and sexual content (Sx) do not have very direct links to the mental state shifts induced by the films. As such, in hindsight it may be reasonable that they were not differentially impacted by those experimental manipulations. Alternatively, it is possible that these codes may be identified more often in Clarification Phase communications leading to a lack of significant elevation when coding was based only on Response Phase communication.

**Consideration of the environmental contingencies.** Another important implication is that, when interpreting these codes, the clinician will need to consider potential situational factors that may influence the fluctuation of these codes. For example, when the Rorschach was fully administered right after the film clip in Hsiao et al.’s study (2011, 2012), the experimental effect was significantly captured by the Rorschach. However, in this study when the SC-IAT was administered in between the Response Phase and Clarification Phase, the carryover effect from the films was captured only during the Rorschach Response Phase. The SC-IAT required self-related terms to be aligned with pictures that mixed aggressive and love images and this appeared to produce another carryover or counter-balance effect that was then captured by the
Rorschach during the Clarification Phase. It is likely that the new carryover or counter-balance effect from the SC-IAT was one that returned participants to their baseline level of cognitive imagery. Thus, the unexpected negative results in the first round of data analyses in this study using coded information from both the Response Phase and Clarification Phase are more likely to represent the participants’ quick shift in cognitive-affective mindsets in response to the change of environmental demands and stimuli that required classifications of self-relevant terms in relation to hostile or loving visual stimuli.

Nonetheless, following this line of thought, another implication could also be extended to consider the long term effect from environmental factors in shaping participants cognitive-affective mindsets. It can also be assumed that if a person constantly seeks out or is surrounded by a toxic, aggressive, or hostile environment, they would be more likely to carry those cognitive-affective mindsets and produce more aggressive-hostile related Rorschach codes. By the same token, it can also be assumed that if a person consistently seeks out or is immersed in a warm, loving, and supportive environment, they would also be more likely to possess those cognitive-affective mindsets and display more of the communion-love related Rorschach codes.

Taking into account the gender difference and the dual process mechanism in responding to aggressive – hostile stimuli. In addition to the experimental or environmental effects, gender effects continued to be documented in this study, as in Hsiao et al.’s (2011, 2012) study. Males were more susceptible to the film clip that was congruent with a traditional male gender identity in the aggression condition and produced a relative congruent presentation on induced cognitive-affective mindsets.
between self-reported experience from the PFQ and performance based measurement from the Rorschach. That is, the results from the focused contrast and 2x3 ANOVAs from both the PFQ and Rorschach provided support the idea that male participants in the aggression condition not only consciously perceived the characteristics and actions from aggressive – hostile stimuli as proud, strong, confidant, bold, daring, fearless, excited, enthusiastic, lively, and energetic, but also were preoccupied with aggressive – hostile imagery as represented by AGC, AGCM and AGCMmCOP from the Rorschach. As for female participants, the incongruence between a traditional female gender identity and the characters or actions presented from the film in the aggression condition produced an incongruent cognitive-affective mindset between self-reported experience from the PFQ and performance based measurement from the Rorschach. That is, the aversive reactions they experienced toward the aggressive – hostile stimuli were documented on the PFQ as females consciously perceived the characters or actions as scornful, disgusting, and loathing. Nonetheless, the preoccupation with aggressive – hostile imagery was still present in female participants and reflected on their elevated AGC, AGCM, and AGCMmCOP Rorschach codes relative to women in the other conditions (see Figures 4.16 to 4.19). Thus, the film stimuli consistently influenced the content of what was on one’s mind for both genders, but each gender had different conscious reactions to that content. The congruent presentation between explicit and implicit measurements for male participants and the incongruent presentation between explicit and implicit measurements for female participants are in line with the dual process theories in current social psychology (Chaiken & Trope, 1990). This is especially an important implication to clinical practice as clinicians may find quite diverse and different explicit expressions
from males or females in reacting to aggressive related circumstance, such as domestic violence, or abuse related incidents, but they may all possess similar implicit cognitive-affective mindsets.

**Limitations of the Study**

Several strengths could be recognized from the current research. At the same time, a few weaknesses were also identified through the process of conducting this research. For the strengths, the current study examined the Rorschach’s validity through an experimental design that is more commonly found in nonclinical subfields of psychology, including the study of emotion, social cognition, and interpersonal interactions. Additionally, it was carried out by applying Interpersonal Theory as a unifying theoretical framework and implemented following Bornstein’s (2011, 2012) proposed process-focused model to validate test variables. Finally, the Rorschach group administration procedure implemented in this study allowed the researcher to collect the needed large sample size for three conditions in a reasonably timely manner.

Nonetheless, some prominent weakness and limitations of this study can be identified. They include the selection of the film in the aggression condition, the selection of the SC-IAT as a parallel criterion variable, and the major weakness using an experimental procedure that failed to take into account the potential interference from administering the SC-IAT between the Response Phase and Clarification Phase.

**Selection of the film in the aggression condition.** Given the significant opposite reactions males and females had to the film in the aggression condition, this researcher reviewed the content of the clip from 300. All of the characters in this clip were males and it depicted a king leading a group of his finest solders to fight against thousands of
enemies that far outnumbered them. Such characteristics emphasize a prototypically male gender identity as the dominant feature in the film and this allowed male participants to easily identify with the film, but not females. Given that males and females tend to express their aggression and hostility in different formats and with different intensity levels, an alternative option to improve this study is to find another film clip that contains females as the main characters engaging in aggressive-hostile actions. This might facilitate the female participants’ willingness to identify with the characters and reduce their reactions of rejection and avoidance to tune into the aggressive film clip.

Additionally, the researcher could also resolve this issue by including a questionnaire item asking the participant whether they could identify with the main characters, the king and his army who perform most of the aggressive actions in the movie clip from 300. The answer from this question could then be used for post-hoc analyses to determine whether the participants who identified with the main characters demonstrated more congruent self-reported and behavioral performance-based measurements. Another alternative way to resolve this issue is to select film clips that have both male and female characters aggressing against a non-human target, such as a group of zombies.

In terms of gender identity, future research could beneficially also take into account not just the biological gender of participants but also their degree of gender identity. Thus, in the demographic information section, it would be important to include a few items assessing gender identity to facilitate more accurate data analyses.
**Selection of the SC-IAT as a parallel criterion variable.** The current study is the first to use the SC-IAT as an alternative performance-based implicit measure to serve as a parallel criterion variable to be impacted by the films when validating the Rorschach. One of the major advantages is that both measures share the similarity of relying on participants’ responses to visual stimuli as a way of detecting their underlying implicit cognitive-affective mindsets. However, one of the major differences is that the SC-IAT scales were computed based on the reaction time in classifying the pictures and self-relevant terms without utilizing language expression. Thus, it heavily emphasized the behavior of the participants in estimating the implicit cognitive-affective mindset. On the contrary, the Rorschach variables rely on the additional involvement of language expression from the participants to produce the scores for the selected codes. Participants were also allowed to take about 15 minutes in the Response Phase and 30 to 40 minutes in the Clarification Phase to produce responses to the inkblot. With different time frames and language requirements the SC-IAT and Rorschach may represent different pathways of mental processes, requiring different quantities of mental energy, and reflecting different levels of mental activities.

Additionally, another main reason that the SC-IAT may not have worked as expected might be that the Rorschach Response Phase served as an interfering activity that blocked or diluted the carry-over effect from the films to the SC-IAT. Alternatively, it is also possible that the SC-IAT is not as responsive to state like influences as the Rorschach Response Phase. Thus, further study would be needed to first establish how well the SC-IAT is capable of capturing the carryover effects from the experimental
manipulation in this study. After that, the consideration of selecting SC-IAT as the potential parallel criterion variable will be more adequate.

**Experimental procedure.** As mentioned above, the experimental procedure is the main weakness in this study and it limited the possibility to produce sufficiently strong results for fully testing the original research hypotheses. Two main drawbacks on the experimental procedure are identified. First, the current study administered five measures in total through the whole experiment with three of them (CRT-A, Rorschach, and SC-IAT) requiring a high level of mental activity and sustained mental energies to complete. Different from Hsiao et al.’s (2011) study, which required a total experiment time of 1 to 1.5 hours, this study extended the required time range to between 2 to 3 hours, with 2.5 hours as the average (See Figure 3.1). Thus, the long duration of the experiment may have reduced the participants’ sensitivities or concentration in responding to the experimental film stimuli due to mental fatigue, as the Rorschach was initiated about 1 hour after the experiment started in the current study while it was initiated about 15 minutes after the experiment started in Hsiao et al.’s study (2011).

Furthermore, depending on the intensity of the priming, the carryover effect induced by films typically last about 10 minutes and then subside after passing this time frame (Rottenberg, Ray, & Gross, 2007; Rottenberg, personal communication, October, 2009). Thus, it is possible that the first five Rorschach cards are more susceptible for capturing the strongest carryover effect than the later five Rorschach cards. Thus, in addition to a fatigue effect, a subsiding carryover effect would also need to be taken into account as part of the experimental design. Alternatively, one could try to amplify the carryover effect. For instance, during the full experiment there could be background
music playing that is congruent with the intended mental set of the film clip, or even playing a repeating audio of the film that was just viewed while the participants were administered Rorschach RP and CP.

Moreover, as mentioned above, although there is an advantage of using the Rorschach with the SC-IAT due to both of them relying on visual stimuli, such an advantage could also be a double edged sword. That is, when one is administered before the other, their images and task requirements may interfere with the experimental effect and dilute the influence of the film-induced cognitive-affective mindsets. The current study failed to identify this confound during the initial design of the experimental procedure, though it now provides an important insight to pay attention to when developing future experiments.

**Recommendations for Future Research**

Based on the recognized strengths and identified weaknesses of this study, three recommendations are provided for future research. These recommendations cover the advantages of the current research design as well as the need to modify the experimental procedure to better validate Rorschach codes. Moreover, during the process of additional analyses, this researcher realized the potential benefit of expanding the Rorschach’s Content codes and interpersonally related Thematic codes under the Interpersonal Circumplex framework. Finally, if the expansion of these codes is successfully carried out, the utility of the Rorschach could be extended to contributions and applications in the field of positive psychology and health psychology in the future.

**Advantage of current research design and the direction for modification.**

First of all, future researchers are encouraged to take advantage of the already established
foundation from this study to replicate the experimental design in validating other Rorschach variables that are suitable to be coded using responses generated in a group administration and without an examiner-led Clarification Phase. That is, certain Rorschach variables are more appropriate to be validated through the current experimental procedure than others. The more optimal codes are those that relate to the content that is perceived and where it is located in the inkblots, such as the Content codes, Thematic codes, Synthesis, Vagueness, Pair, or Location. Variables that require an explanation of the inkblot features that make particular objects look the way they do or that code the logic and coherence of verbal communications might not be as applicable to validation by this research design, such as many of the Determinant codes or Cognitive Codes.

Second, when attempting to validate Rorschach codes, it is important that the Rorschach administration procedures be intact and uninterrupted. As it was suspected from the results of this study, the SC-IAT was originally designed to be used in tandem with the Rorschach to have two implicit measures as criteria for capturing the carryover effects from the films. With the SC-IAT administered between the Rorschach Response Phase and Clarification Phase, the requirement of participants to classify self-related words and pictures that contained aggressive and love images likely produced another unexpected interference effect that reset or counter balanced participants’ mental mindsets to a baseline level of aggressiveness and lovingness. At the very least, the SC-IAT exposes all the participants in aggression condition to loving stimuli and self-relevant words and all the participants in love condition to aggressive stimuli and self-relevant words. This is probably the main reason the current study could not add
additional evidence supporting the validity of the interpersonally related Thematic codes by making use of additional communications from the Clarification Phase.

Third, as indicated previously, in addition to the current film in the aggression condition, it might be worth considering selecting another film that focused on female characters in the aggression condition – or both male and female characters together – to produce a better experimental effect for female participants. Alternatively, another future direction could be to explore films that focus on relational aggression rather than instrumental aggression, as these might be easier for female participants to identify with. If such a film was found and its ability to produce the target experimental effect was established, it may provide another opportunity to further examine gender differences and the dual process mechanisms that have been conceptualized from this study.

Fourth, it would be interesting to explore what PFQ scores would be if they were obtained directly following the films, rather than after a delay. This design could be expanded, such that some participants could be given just the PFQ and some just one other dependent measure.

Finally, related to the last point, future research could potentially validate both the Rorschach and SC-IAT as long as they were designated to be individual outcome variables after the experimental manipulation. This would reduce their interference effect on each other. For instance, the current research design could be modified to form one sub-project by administering a baseline set of PFQ items prior to the film clip, followed by administering the Rorschach Response Phase immediately after the film, administering the PFQ again for an experimental manipulation check as well as to sustain the carryover effect from the films, and then administering the Rorschach Clarification
Phase. Another sub-project could be conducted by administering a baseline set of PFQ items prior to the film clip, followed by administering the SC-IAT immediately after film, and then administering the PFQ again for an experimental manipulation check. The combination of these two subprojects might be able to provide more flexibility in examining the validity of both implicit measures.

**Expanding Rorschach codes under the Interpersonal Circumplex framework.** Another recommendation that can be drawn from the current study is that the current R-PAS interpersonally related Thematic codes and Critical Contents codes favor the aggression-hostility domain on the interpersonal circumplex and are less likely to tap the communion-love domain on the circumplex. Thus, even though a person’s high scores in the aggression-hostility domain may represent his or her implicit aggressive-hostile cognitive-affective mindset, a lack of elevated scores in this domain does not necessary support the rationale that the person’s implicit cognitive-affective mindsets would fall into the positive end on the communion-love domain on the interpersonal circumplex. The relative absence of codes for capturing imagery in this domain was attempted to be filled by the newly created Pleasant and Colorful Contents codes. Further research testing the newly created PCC codes would be beneficial in contributing to the utility of Rorschach.

Furthermore, when utilizing interpersonal theory as a framework to validate the Rorschach on the aggression-hostile and communion-love dimensions, the imbalanced number of Rorschach variables represented by these two dimensions could lead to bias interpreting the results. For example, 5 out of the 7 variables selected to be validated in this study were conceptualized to be in line with the aggression-hostile dimension (AGC,
AGM, MOR, MAP, and CCI%) while only two were conceptualized to be in line with the communion-love dimension (COP and MAH). Thus, it could be argued that the Rorschach hasn’t yet established sufficient codes to capture the intended communion – love dimension on the interpersonal circumplex. Therefore, it is also important for future researchers to develop other Rorschach codes that are in line with the communion-love domain, or even other domains on the interpersonal circumplex. The advantages of filling this gap is that it may provide the opportunity for the Rorschach to converge with the current personality research focused on dimensional models.

**Application of the Rorschach in the field of positive psychology and health psychology.**

In addition to convergence with current personality research focused on dimensional models, expanding Rorschach codes under an Interpersonal Circumplex framework may also provide an opportunity to expand the Rorschach’s utility in the field of positive psychology or health psychology by detecting the protective psychological factors of patients. Some elements of the new Pleasant and Colorful Content codes may add to COP and MAH in this regard. For instance, patients who contain implicit cognitive-affective mindsets that leave them prone to identify and interpret the ambiguous inkblot information positively and pleasantly, or maintain an openness and receptivity to what is bright and enlivening their surrounding environments might be able to predict a better treatment progress or outcome quality than patients who contains implicit cognitive-affective mindsets of experiencing distance or aloofness from others. One potential application in the field of health psychology is about cancer patients. Current health psychologists have shifted attention to the quality of life in cancer patients.
after they receive medical treatment. Studies have found that optimism played an important role in reducing psychological stress and depression in women with breast cancer (Shaheen, Andleeb, Ahmad, & Bano, 2014; Garner, McGregor, Murphy, Koenig, Dolan, & Albano, 2015), and these new codes may have implications for optimism. The current Rorschach literature has limited application to the fields of positive psychology and health psychology and such study will be much needed in the future to continue bridging the gaps between clinical psychology and other subfields of psychology.

**Conclusion**

The findings of this study expanded the work from previous studies conducted by Hsiao et al. (2011, 2012) as an attempt to provide further evidence for the validity of Rorschach interpersonally related Thematic code and Critical Content codes. This investigation revealed that the results from first round of data analyses supported the research hypothesis 1, but not research hypothesis 2. That is, the intended experimental effects were successfully produced when assessed through the explicit measurements. Participants watching the aggressive and love films reported experiencing a significant degree of congruent mental states. However, neither of the implicit measures, the Rorschach and the SC-IAT, captured the expected film-induced cognitive – affective mindsets.

A further exploration of the potential interference factors was reviewed. It was suspected that the administration of SC-IAT between the Rorschach Response Phase and Clarification Phase reset or counter balanced the carryover effect produced by the films, bringing participants back to their baseline levels. Additional analyses were conducted after excluding the potential interference factors by coding the Rorschach
communications in the Response Phase only. In addition, the Pleasant and Colorful Content (PCC) code, which contains four subcategories, was also created to better capture the implicit carryover effect in the love condition. The results from additional analyses partially supported hypothesis 2 that participants’ corresponding implicit cognitive-affective mindsets were activated by the films and can be captured by the Rorschach. Specifically, AGC and AGM were found to be significantly increased in the aggression condition, decreased in the love condition, and average in the neutral condition. The greatest experimental effect was found when an aggregated code was created by combining AGC and AGM and then subtracting COP. PCC and its subcategory, ColorLoc, were also found to be significantly increased in the love condition, decreased in the aggression condition, and average in the neutral condition.

Research hypothesis 3 was then conducted for AGC, AGM, PCC, and ColorLoc to examine whether the Aggression – Hostility and Communion – Love dimensions assessed from the combination of baseline explicit and implicit measurements using the IPQ and CRT-A, respectively, contributed addictive effects to the significant results. The regression analyses showed that no addictive effect was found. That is, the dispositional congruent implicit and explicit cognitive – affective mindsets on the Aggression – Hostility and Communion – Love dimensions prior to the experimental manipulation had no influence on capturing the carryover effects after the experimental manipulation. In other words, regardless whether a person has a higher or lower mindset on Aggression – Hostility or Communion – Love, it did not contribute to the prediction of the Rorschach codes across all three conditions.
In addition to the experimental effect, gender was also examined and found to be a significant factor in the current study. Although male participants consciously experienced the aggressive – hostile stimuli in the aggression condition as positive and female participants experienced it as negative, they both displayed increased implicit aggressive-hostile cognitive-affect mindsets on the Rorschach relative to their same gender peers in the other conditions. Such results further support the importance of gender differences and the dual process mechanism that prompts individuals to respond to the same situational influence in different ways.

Finally, the implication that can be drawn from the results of this study for clinical practice, the limitations of the current study, and recommendations for further research were reviewed. Overall, it addressed the value of including the Rorschach as an implicit measure in combination with explicit measures to facilitate a more comprehensive conceptualization of people. It also explored the factors that potentially influenced the results of the current study and suggested promising future directions for Rorschach research to enhance its potential contribution to other fields of psychology.
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Appendix A

Sample Items of IPQ (Trapnell & Broughton, 2006)

Instructions: Listed below are different phrases used to describe people. For each phrase, circle the number that most accurately and honestly describes you. Interpret the scale as shown below. Please do not skip any. If you feel unclear about a phrase, simply make as good a guess as you can.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neither Agree nor Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Assertive:
I love being in the spotlight.  
1  2  3  4  
5

Dominant:
I am very assertive by nature.  
1  2  3  4  
5

Manipulative:
I am willing to be ruthless at times to get what I want.  
1  2  3  4  
5

Coldhearted:
I have a cold manner of dealing with people at times.  
1  2  3  4  
5

Aloof:
I am not really interested in others.  
1  2  3  4  
5

Introverted:
I dislike having a lot of people around me.  
1  2  3  4  
5
Timid:
I tend to be the quiet one in a group.

Deferent:
I am easy to push around.

Agreeable:
I am not good at deceiving people

Nurturant:
I am especially careful never to hurt anyone’s feelings

Warm:
I am good-natured and cheerful toward almost everyone

Extravert:
I love talking to almost anyone
Figure A.1. Interpersonal Circumplex Dimension Scales generated by IPQ (Trapnell & Broughton, 2006)
Figure A.2. Interpersonal Circumplex Dimension Scales generated by IPQ (Trapnell & Broughton, 2006)
Appendix B
Sample Items of CRT-A (James & McIntyre, 2000)

INSTRUCTIONS: Identify the one answer that is the most logical. Be sure that you read each answer carefully to choose the best answer.

Sample Item: American cars have gotten better in the last 15 years. American car makers started to build better cars when they began to lose business to the Japanese. Many American buyers thought that foreign cars were better made.

Which of the following is the most logical conclusion based on the above?

a. America was the world's largest producer of airplanes 15 years ago. (illogical)
b. Swedish car makers lost business in America 15 years ago. (illogical)
c. The Japanese knew more than Americans about building good cars 15 years ago. (nonaggressive)
a. American car makers built cars to wear out 15 years ago, so they could make a lot of money selling parts. (aggressive)
Appendix C

Post-Film Questionnaire (PFQ)

Instruction for control group

Please indicate the emotion you are experiencing upon your arrival and prior to the beginning of the experiment

<table>
<thead>
<tr>
<th>very</th>
<th>a little</th>
<th>moderately</th>
<th>quite a bit</th>
<th>extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>connected</td>
<td>blue</td>
<td>delighted</td>
<td>embracing</td>
<td></td>
</tr>
<tr>
<td>angry</td>
<td>strong</td>
<td>lively</td>
<td>supported</td>
<td></td>
</tr>
<tr>
<td>sad</td>
<td>joyful</td>
<td>caring</td>
<td>disgusted</td>
<td></td>
</tr>
<tr>
<td>proud</td>
<td>enthusiastic</td>
<td>loved</td>
<td>lonely</td>
<td></td>
</tr>
<tr>
<td>happy</td>
<td>loving</td>
<td>scornful</td>
<td>daring</td>
<td></td>
</tr>
<tr>
<td>excited</td>
<td>safe</td>
<td>alone</td>
<td>supporting</td>
<td></td>
</tr>
<tr>
<td>compassion</td>
<td>irritable</td>
<td>bold</td>
<td>loathing</td>
<td></td>
</tr>
<tr>
<td>cared for</td>
<td>downhearted</td>
<td>cheerful</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hostile</td>
<td>confident</td>
<td>energetic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Instruction for 300 and Braveheart group

Please recall the emotion you experienced after watching the film

<table>
<thead>
<tr>
<th></th>
<th>1 very connected</th>
<th>2 slightly or blue</th>
<th>3 not at all delighted</th>
<th>4 a little embracing</th>
<th>5 not at all supported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>very angry</td>
<td>a little strong</td>
<td>moderately lively</td>
<td>quite a bit caring</td>
<td>extremely disgusted</td>
</tr>
<tr>
<td></td>
<td>sad</td>
<td>joyful</td>
<td>loved</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proud</td>
<td>enthusiastic</td>
<td>loved</td>
<td></td>
<td>lonely</td>
</tr>
<tr>
<td></td>
<td>happy</td>
<td>loving</td>
<td>scornful</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>excited</td>
<td>safe</td>
<td>alone</td>
<td></td>
<td>supporting</td>
</tr>
<tr>
<td></td>
<td>compassion</td>
<td>irritable</td>
<td>bold</td>
<td></td>
<td>loathing</td>
</tr>
<tr>
<td></td>
<td>cared for</td>
<td>downhearted</td>
<td>cheerful</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hostile</td>
<td>confident</td>
<td>energetic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Hostility Scale = Hostile-Affect + Hostile-Revulsion
Hostile-Affect = angry + hostile + irritable.
Hostile-Revulsion = scornful + disgusted + loathing.
Sadness Scale = sad + blue + downhearted + alone + lonely.
Self-Assurance Scale = proud + strong + confident + bold + daring + fearless.
Jovial Scale = Jovial-Valence + Jovial-Arousal.
Jovial-Valence Scale = happy + joyful + delighted + cheerful.
Jovial-Arousal Scale = excited + enthusiastic + lively + energetic.
Communion Scale = Communion-Providing + Communion-Receiving.
Communion-Providing Scale = compassion + loving + caring + embracing + supporting.
Communion-Receiving Scale = connected, cared for, safe, loved, supported.
## Appendix D

### Expanded List of AGC Threshold Examples

<table>
<thead>
<tr>
<th>Generally Below the Threshold for AGC</th>
<th>Generally Above the Threshold for AGC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clothing, Tools, and Objects</strong></td>
<td></td>
</tr>
<tr>
<td>Goggles, Headdress, Helmet (Sports), Mask, Vest</td>
<td>Armor, Helmet (Military), Shield, Warrior Headdress</td>
</tr>
<tr>
<td>B-B, Pellet, Stone, Arrow (Directional)</td>
<td>Arrow, Arrowhead, Bullet, Cannonball</td>
</tr>
<tr>
<td>Firecracker, Fireworks</td>
<td>Bomb, Missile, Nuclear Warhead, Torpedo</td>
</tr>
<tr>
<td>Hammer, Pliers, Wrench</td>
<td>Axe, Hatchet, Sledgehammer</td>
</tr>
<tr>
<td>Butter/Dinner Knife, Fork, Stick, Pole</td>
<td>Blade, Boomerang, Knife, Mace, Spear, Sword, Tomahawk</td>
</tr>
<tr>
<td>Pea-Shooter, Slingshot, Squirt Gun</td>
<td>Bow (for Arrow), Cannon, Gun, Rifle, Shotgun, Spear-Gun</td>
</tr>
<tr>
<td>Boat, Plane, Rocket Ship, Tanker</td>
<td>Battleship, Dive Bomber, Fighter Jet, Gun Boat, Stealth Jet, Tank</td>
</tr>
<tr>
<td>Thumbs Up Sign, Pentagram (No Circle)</td>
<td>Devil’s Sign, Pentacle</td>
</tr>
<tr>
<td>Jack-o-Lantern, Mask, Opera Mask</td>
<td>Evil Pumpkin, Mask of Death</td>
</tr>
<tr>
<td>Pitchfork, Rope</td>
<td>Devil’s Pitchfork, Noose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Organisms (Real and Imaginary)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protozoa, Microorganism, Algae</td>
<td>Virus, Germ (pathogen), Bacteria</td>
</tr>
<tr>
<td>Vesuvius Fly Trap</td>
<td></td>
</tr>
<tr>
<td>Spider</td>
<td>Black Widow, Tarantula, Big Spider, Wolf Spider</td>
</tr>
<tr>
<td>Bee</td>
<td>Hornet, Yellow Jacket, Wasp</td>
</tr>
<tr>
<td>Bug, Insect, Fly</td>
<td>Mosquito, Scorpion, Fire Ant</td>
</tr>
<tr>
<td>Carp, Catfish, Marlin, Sailfish, Salmon, Tuna</td>
<td>Barracuda, Hammerhead, Muskellunge, Swordfish, Sawfish, Piranha, Shark</td>
</tr>
<tr>
<td>Ray, Manta Ray, Eel</td>
<td>Stingray, Morey Eel</td>
</tr>
<tr>
<td>Garter Snake, Snake</td>
<td>Anaconda, Cobra, Copperhead, Poisonous Snake, Rattlesnake, Water Moccasin</td>
</tr>
<tr>
<td>Iguana, Lizard</td>
<td>Alligator, Crocodile, Giant Lizard, Komodo Dragon</td>
</tr>
<tr>
<td>Dinosaur, Archaeopteryx</td>
<td>Tyrannosaurus, Pterodactyl</td>
</tr>
<tr>
<td>Crow, Egret, Jay, Raven</td>
<td>Eagle, Falcon, Hawk, Raptor, Vulture</td>
</tr>
<tr>
<td>Bat, Fruit Bat</td>
<td>Vampire Bat</td>
</tr>
<tr>
<td>Cat, Feral Cat, Ocelot, Polecat</td>
<td>Bobcat, Cheetah, Cougar, Jungle Cat, Leopard, Lion(ess), Lynx, Mad/Rabid Cat, Panther, Tiger</td>
</tr>
<tr>
<td>Dog, Fox</td>
<td>Coyote, Evil Dog, Hyena, Jackal, Wolf</td>
</tr>
<tr>
<td>Hog, Pig</td>
<td>Boar or Pig, with Tusks</td>
</tr>
<tr>
<td>Bear, Dancing Bear, Circus Bear, Panda Bear</td>
<td>Grizzly Bear, Huge Bear</td>
</tr>
<tr>
<td>Deer, Elk, Moose</td>
<td>Bull, Rhinoceros, or Bison, with Horn(s) Identified</td>
</tr>
<tr>
<td>Dolphin, Porpoise, Whale</td>
<td>Killer Whale</td>
</tr>
<tr>
<td>Generally Below the Threshold for AGC</td>
<td>Generally Above the Threshold for AGC</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Monkey, Chimp, Ape</td>
<td>Gorilla</td>
</tr>
<tr>
<td>Person</td>
<td>Devilish Smile, Donnie Darko, Evil Person, Evil Eyes/Grin, Murderer</td>
</tr>
<tr>
<td>Policeman, Sheriff</td>
<td>Knight, Ninja, Samurai, Soldier, Warrior</td>
</tr>
<tr>
<td>Bigfoot, Unicorn, Yeti</td>
<td>Dragon, Godzilla, King-Kong</td>
</tr>
<tr>
<td>Creature, Fairy, Giant, Sprite</td>
<td>Beast, Evil Creature, Gargoyle, Goblin, Monster</td>
</tr>
<tr>
<td>Ghost (unspecified)</td>
<td>Demon, Devil, Poltergeist</td>
</tr>
<tr>
<td>Pokémon: Bulbasaur, Caterpie, Pichu, Pichu, Squirtle</td>
<td>Aggron, Charizard, Gliscor, Gyarados, Machamp, Magmar, Scyther</td>
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<tr>
<td>Transformers: Bumblebee, Jazz, Unspecified</td>
<td>Autobots (Most), Decepticons (Most), Megatron</td>
</tr>
<tr>
<td>X-Men: Angel, Cyclops, Iceman</td>
<td>Apocalypse, Magneto</td>
</tr>
</tbody>
</table>

**Animal Parts**

- Used for ornamentation or walking, such as hooves, horns, antlers
- Used for clenching, grabbing, stinging, such as claw, fangs, mandibles, pincers, sharp teeth, stinger, tentacles, tusks

**Environmental Forces**

<table>
<thead>
<tr>
<th>Fire</th>
<th>Forest Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fireworks, Cumulus Cloud</td>
<td>Explosion, Mushroom Cloud, Storm Clouds</td>
</tr>
<tr>
<td>Wind</td>
<td>Cyclone, Hurricane, Tornado</td>
</tr>
<tr>
<td>Ocean Wave</td>
<td>Tidal Wave, Tsunami</td>
</tr>
<tr>
<td>Volcano</td>
<td>Volcano Erupting</td>
</tr>
</tbody>
</table>
Appendix E

The Single Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006)

Target words and pictures that will be used in the SC-IAT

<table>
<thead>
<tr>
<th>SC-IAT target words</th>
<th>Aggressive-Communion target pictures*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self</strong></td>
<td>Me</td>
</tr>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>Myself</td>
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<table>
<thead>
<tr>
<th>Aggressive</th>
<th>Communion</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAPS slide #1932</td>
<td>Shark</td>
</tr>
<tr>
<td>IAPS slide #1321</td>
<td>Bear</td>
</tr>
<tr>
<td>Bears</td>
<td>IAPS slide #1441</td>
</tr>
<tr>
<td>IAPS slide #6250</td>
<td>Aimed Gun</td>
</tr>
<tr>
<td>IAPS slide #1726</td>
<td>Tiger</td>
</tr>
<tr>
<td>IAPS slide #2691</td>
<td>Riot</td>
</tr>
<tr>
<td>IAPS slide #6211</td>
<td>Attack</td>
</tr>
<tr>
<td>IAPS slide #6940</td>
<td>Tank</td>
</tr>
<tr>
<td>IAPS slide #6940</td>
<td>Romance</td>
</tr>
<tr>
<td>IAPS slide #8060</td>
<td>Boxer</td>
</tr>
<tr>
<td>IAPS slide #1050</td>
<td>Snake</td>
</tr>
<tr>
<td>IAPS slide #2130</td>
<td>Woman</td>
</tr>
<tr>
<td></td>
<td>Dolphins</td>
</tr>
<tr>
<td></td>
<td>IAPS slide #2550</td>
</tr>
<tr>
<td></td>
<td>IAPS slide #2170</td>
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<td>IAPS slide #2360</td>
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<td>IAPS slide #4606</td>
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<td>IAPS slide #2091</td>
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<tr>
<td></td>
<td>IAPS slide #2352</td>
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<td></td>
<td>IAPS slide #1920</td>
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</table>

*Pictures are attached in the following two pages.
Appendix F

Hsiao & Meyer (2015) Pleasant and Colorful Contents (PCC)

Guideline criteria for the new codes included the following categories:

Category I: Pleasant Contents (Pleasant)
Figures, Objects, Places, Events, Activities, or Emotional Expressions That Represent Something Uplifting, Good, Positive, Friendly, Joyful, or Happy (Apply to Responses in All 10 Cards):

A. Figures or Objects: Cheerleader, Acrobat, Dancer, Ballerina, God, Angel, Guardians, Buddha, Fairy, Confetti, The Inside of an Iris Bloom, Lover’s Heart, Flower Arrangement, Holy Grail, Two Love Birds, Circus Animals, A Wedding Dress, Praying Hands, Jazz Band. Do not code spoiled images, like “Headless Angel”.

B. Places: Circus, Heaven, Temple, Church, Paradise, Inviting and Comfortable Place, Amusement Park, Disney World, Flower Garden, Aquarium, An Open Park, Art Gallery.


D. Activities: A New Beginning, A Budding / Blooming / Sprouting Flower, A Flower Growing From The Ground, Play, Circus Act, A Person Dancing in the Rain, People or Animals Frolicking, Two People Holding Hands, Shaking Hands, Putting Hands Together, Touching, Touching Noses in front of the Eiffel Tower, A Man Playing the Saxophone (or any Instrument), Two Men Playing the Flute (or Any Instrument), A Person Singing, Two People Gardening, Two People with Hands Pressed Together, Two People Praying, A man Kneeling Praying, Clapping Each Other’s Hands.

E. Emotion or Interpersonal Experiences or Expressions (Movement is not Required): Smiling or Laughing (Excluding any that are Evil, Creepy, Sadistic, Ominous, or Sinister), Two Thumbs Up, High-Five, Embrace, Kiss, Snuggle, Happiness, Unity, Union, Joy, Freedom, Alive and Pure, Innocent, Love, Warmth, Excitement, Funny, Extravagant, Cheering, Hugging, Sharing a Moment with Each Other, Their Hearts are Connected.
**Category II: Colorful Contents (Colorful)**
Pretty or Colorful Responses Given in Colored Cards (II, III, VIII, IX, X) that Contain Pleasant or Relaxing Components, Whether or not Color is Identified:

- Spring/Summer Time, Sunrise, Sunset, Rainbow, Rainbow Fish, Colorful Tree, Fancy Colorful Mask, Colorful Vase, Coral (Sea) Reef, Aquatic Life, Tropical Scene, Palm Trees, Brightly Colored Ball, Gown, Bright Orange Flower, Specified Flowers (e.g. Tulip, Orchid, Rose), Beautiful/Colorful Butterfly, Colorful Dress, Artistic Color in Abstract Art, An Adorned Hollywood Actress, Colorful Clouds.

**Category III: Use of Color as Determinants (SumC)**
Colored Objects Given in Colored Cards (II, III, VIII, IX, X) without Inherently Pleasant or Relaxing Components (i.e., Seeing Color Reflects Openness and Receptivity to the Environment):


**Category IV: Use of Color as a Locator (ColorLoc)**
Colors are Used as a Locator in Colored Cards (II, III, VIII, IX, X) (i.e., The Performance-Based Presentation of Paying Attention to and Naming the Colors as Areas Represents Openness and Receptivity to the Environment):

- The “Grayish Black Ink” Looks Like a Rat, “The “Green Ink” Looks Like a Tree.”

**Note:**

a. Category III is separated from Category II because Category III is equivalent to the existing R-PAS determinant codes of FC, CF, and C. However, our overall focus is not differentiating those three determinants from one another, but targeting the content associated with color. In other words, we view Sum C (FC+CF+C) as part of the PCC Content Code.

b. Category IV is separated from Category III because Category IV is a new code that focuses on just the naming of colors instead of pointing or using the terms right, left, top, down, or center to indicate a location. Exhibiting this kind of behavior is consistent with the concept of being open and receptive to the environment.