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Title Page

Card Pull Effects of the TAT using the SCORS-G on a Complex Psychiatric Sample

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Researchers interested in learning more about the data that support the findings of this study may contact the corresponding author. The data are not publicly available due to their containing information that could compromise the privacy of research participants

Abstract

In recent years, there has been growing interest in examining the stimulus pull effects on respondent narratives to the Thematic Apperception Test (Murray, 1943) using standardized coding methods such as the Social Cognition and Object Relations Scale–Global Rating Method (SCORS–G; Stein, Hilsenroth, Slavin-Mulford, & Pinsker, 2011; Westen, 1995). The present study expands on prior work by examining sources of variance in SCORS-G dimensions and card pull effect patterns in an adult clinical sample characterized by high psychiatric comorbidity and clinical severity. A sample of 158 adult psychiatric patients in long-term residential treatment provided narratives to ten TAT cards (five of which have not previously been studied for pull effects). Cards 2 and 7BM pulled for significantly more adaptive narratives (positive pull) while Card 13MF pulled for more pathological stories (negative pull). Like prior studies, variance in cognitive dimensions of the SCORS-G was most explained by person effects, while the largest source of variance for all other dimensions was best explained by a combination of the card and the person effects on the narrative. Finally, exploratory analyses of card pull effects within different gender groups were conducted. The implications of these findings for

performance-based future studies and possible clinical applications of card pull findings are discussed.

Keywords: card pull; TAT; SCORS-G; gender effects; performance-based assessment

Key Practitioner Points:

- Different TAT cards exert different "card pull" as assessed by the SCORS-G rating system, with Card 2 exhibiting the most consistent pull for adaptive narratives and 13MF showing the most consistent pull for more pathological ones within the study card set.

- The cognitive dimensions of the SCORS-G (complexity of mental states and understanding of social causality within the narrative) are more strongly influence by individual narrator characteristics, while other affective-relational dimensions are affected more by the stimulus properties of the cards.

- Within male and female participant groups, different patterns of pull effects emerged for different cards, suggesting that clinicians should consider the gender of examinees when selecting TAT card sets in order to minimize the potential of introducing bias.

The Thematic Apperception Test (TAT; Murray, 1943) is one of the most commonly

used performance-based measures of personality in clinical practice (Mihura, Roy & Graceffo,

2017), often being used in conjunction with empirically-supported scoring systems assessing

social cognition, object relations (Siefert et al., 2016; Stein et al., 2014), and defense mechanisms

(Cramer, 1991). Murray intentionally sought to include cards within the TAT that differed with

regard to evocative thematic content (Murray, 1944). Nonetheless, early theorists (e.g., Rapaport,

1952) argued that performance-based tests like the TAT act as a neutral field onto which

respondents "project" aspects of their inner world. Contemporary personality research has,

however, increasingly shown that respondents' narratives are influenced by a range of factors,

including the properties of the card. The purpose of this paper is to build on prior research in this

area by examining card pull effects and factors influencing narratives in a clinical sample to

determine if findings from prior work hold in sample characterized by high psychiatric comorbidity. This can assist clinicians working within these populations in determining if findings from studies involving outpatient and nonclinical samples have implications for their work.

The Thematic Apperception Test and the SCORS-G

The Social Cognition and Object Relations Scale-Global rating method (SCORS–G; Stein & Slavin-Mulford, 2018; Westen, 1995) is a clinically-oriented rating system that assesses social cognition and relational schemas across eight dimensions; it represents one of the most popular current scoring methods for the TAT (Mihura, Roy, & Graceffo, 2017; Stein & Siefert, 2018). The eight dimensions are complexity of mental state representation (COM), clarity of logic underlying social causality (SC), the quality of the relationships [AFF], investment in relationships (EIR) investment in moral standards (EIM), management of aggression (AGG), self-esteem (SE), and identity coherence (ICS). Previous studies have investigated the factor structure of the SCORS-G (Bram, 2014, Lewis et al., 2016; Stein et al., 2012, Siefert et al., 2018). While some studies have found support for a three-factor model (Stein et al., 2012): cognitive dimensions (COM and SC), other-relational (AFF, EIR, EIM, AGG), and a self-relational component (SE and ICS), other studies (Bram, 2014; Lewis et al., 2016) have yielded support for a two-factor model: cognitive (COM and SC) and (AFF, EIM, EIR, AGG, SE, ICS). Siefert et al. (2018) found that both a two- and three-factor model produced good-to-adequate fit for the SCORS-G, although they recommend the two-factor model, which we will be used for

this study. To date, three studies have evaluated TAT card pull effects using the SCORS-G system. These studies have shown that person-factors (e.g. the psychological characteristics of the individual), card-factors (e.g. features of the stimulus), and the interaction between the two contribute to variance in SCORS-G ratings in both adults and children (Auletta et al., 2018; Siefert et al., 2016; Stein et al., 2014). Findings have suggested that variance in scales assessing cognitive dimensions of relational schemas are best explained by person-factors, while variance in affective-relational elements is better explained by card by person interactions.

The SCORS-G and Card Pull on the TAT

The phenomenon of "card pull" refers to the ways in which the visual properties of test stimuli (such as the images on the TAT cards) may evoke particular perceptual and affective responses, independent (at least partially) of the psychological characteristics of the examinee (Peterson & Schilling, 1983). From a clinical standpoint, identifying card pull effects serves to increase validity and accuracy of test interpretation by establishing whether examinee scores represent a "typical" versus atypical response (Kelly, 1999). Knowledge that a given TAT card often "pulls" for aggressive narrative themes, for example, may temper interpretations that assign an undue degree of importance to aggression for that particular card.

Stein et al. (2014) first used the SCORS-G to identify sources of variance in ratings and examine card pull. Using a sample of adult outpatients, they identified several cards showing significant pull effects across the eight SCORS-G dimensions. Card 2 for example pulled for more adaptive narratives (e.g., higher dimension ratings) across several SCORS-G dimensions,

Cards 3BM and 13MF pulled for more pathological narratives, Card 1 was neutral across all dimensions, and Card 12M was also neutral across all dimensions except for a positive pull for EIR.

Since Stein and colleagues initial study, other investigators have reported similar findings in different populations using diverse card sets. Siefert et al. (2016) replicated several of these findings using a nonclinical undergraduate sample: Card 2 once again was found to pull for more adaptive ratings (e.g., AFF, EIR, SE, ICS), while Card 3BM pulled for more maladaptive ratings. Siefert et al. (2016) found that the interaction between person by card effects accounted for the greatest proportion of variance for affective-relational dimensions while cognitive dimensions were more influenced by person factors. Auletta et al. (2018) extended work in this area by replicating findings in a nonclinical sample of children (between ages 7 and 13). Their card set included four TAT cards (Cards 1, 2, 3BM, and 4) that had been used in earlier card pull studies (Siefert et al., 2016; Stein et al., 2014), as well as two cards that had not previously been examined (Cards 8BM and 16). They similarly found large proportions of person-level variance in cognitive dimensions (i.e., 40% for COM and 49% for SC), although in contrast to earlier studies person by card interactions produced the largest variance estimates for all SCORS-G dimensions. O'Gorman and colleagues (2020) have extended this work and applied the SCORS-G to the Picture Story Exercise card set (Smith, 1992). The pattern of findings in terms of variance remained consistent with earlier studies: person effects explained as much variance in the cognitive dimensions as did person by card interactions. For the other affective-relational

SCORS-G dimensions, person by card interactions accounted for the largest amount of variance. Findings from these card pull studies can aid clinicians when they select cards from the TAT set and also guide interpretations. For instance, if on Card 2 a patient told a story about a depressed young woman who was thinking about leaving school after failing her exam this would be considered unusual given that Card 2 tends to pull for more globally positive ratings, especially on the identity scale (i.e. the stories tend to focus on a young woman who is balancing her educational aspirations with family responsibilities).

The Current Study

Previous TAT card pull studies have largely replicated findings across diverse samples. Findings have been most consistent in terms of identifying sources of variance: cognitive dimensions of the SCORS-G system have repeatedly shown higher person-level variance component estimates, indicating these dimensions are influenced primarily by the capacity of the individual participant. In other words, when participants generate a story on the TAT, the relative intricacy of the characters' mental states and soundness of their underlying social logic are likely to be consistent within individual participants across the card set, regardless of the individual card content. In contrast, for the affective-relational dimensions, person by card interactions have produced consistently larger variance component estimates, suggesting that these dimensions (e.g. emotional investment in relationships) speak more to the individual participant's characteristic responsiveness (person) to specific kinds of emotional stimuli (card), or their context-specific relational and emotional adaptations. At this point, however, only one study has

utilized a clinical sample (comprising mainly of psychiatric outpatients) to evaluate pull effects (Stein et al., 2014). It is possible these findings may not replicate in clinical samples characterized by higher clinical severity (Buer Christensen et al., 2019).

Our goal in the current study was to determine whether previous findings would replicate to a large clinical adult sample characterized by high psychiatric comorbidity and clinical severity, in which the precision of personality assessment findings may carry more significant impact on treatment planning and monitoring of change over the course of treatment. We examined pull effects using a TAT card set that overlapped with cards used in prior studies while also examining additional commonly-used cards not previously evaluated (i.e., Cards 7BM, 18GF, 12F, and 5; Aronow, Weiss, & Reznikoff, 2001; Bellak & Abrams, 1997; Cramer, 2017). An additional card (Picasso's La Vie), which was part of an earlier TAT card set (Morgan, 2003), was also evaluated, as it was included in the standard card set used at the data collection site and is still in use in other clinical settings. Finally, given that certain cards in the TAT are intended to be administered to participants based on gender (Murray, 1943), we were interested in exploring whether patterns of pull effects would differ within different gender groups; this is the first study to our knowledge to examine within-gender patterns of TAT card pull effects using the SCORS-G system.

Based on prior studies, we hypothesized that variance in cognitive SCORS-G dimensions would be best explained by person-effects, while the majority of variance in the affective-relational dimensions would be explained by interactions between person and card effects.

Consistent with the findings of Stein and colleagues (2014), we hypothesized that Card 2 would pull for more adaptive ratings, 13MF would pull for more pathological ratings, and 12M would demonstrate neutral pull effects across SCORS-G dimensions and on the global dimension. Our expectations for patterns of pull effect within men and women was left exploratory.

Method

Participants

The sample was comprised of 158 adult psychiatric patients enrolled in long-term residential treatment in the northeastern part of the United States. All patients admitted to the treatment center between 2015 and 2017 who had complete TAT data in their medical records were included (data from only two patients were omitted based on this criteria). Permission to access subject medical records to obtain demographic information and psychological testing data for the current study was granted by the treatment center's Institutional Review Board. The final sample consisted of 87 female patients (M age = 32.90, SD = 13.89) and 71 male patients (M age = 33.46, SD = 12.50), two of which identified as transgender men. The sample identified predominantly as European American (92.4%) and single (74.1%); 77.2% of participants reported at least one inpatient hospitalization. The most common principal diagnoses were depressive disorder (24.7%), unspecified/other specified personality disorder (23.4%), borderline personality disorder (17.7%), bipolar disorder (8.2%), and schizophrenia spectrum and other psychotic disorders (7.0%). On average, each patient carried 3.9 DSM-5 diagnoses (SD = 1.6); 79% percent of participants carried at least one personality disorder diagnosis. Clinical diagnoses

were assigned to participants by the psychiatrist and psychotherapist during the first 6 weeks of treatment using the Longitudinal, Expert, All Data (LEAD) diagnostic standard (Pilkonis, Heape, Ruddy, & Serrao, 1991; Spitzer, 1983).

Procedures

All patients were administered a battery of psychological tests that included the TAT within the first five weeks of treatment as a part of routine clinical practice. All TAT narratives were recorded and transcribed verbatim and rated according to the SCORS-G training manual (Stein et al., 2011). All variance component analyses were conducted in SPSS Version 23 (IBM). Variance component analyses were conducted in accordance with Generalizability Theory (Brennan, 2001; Shavelson & Webb, 1991). This approach employs a two-facet (in which 51 participants were rated by all raters and completed all cards) random model with ANOVA (Type I) estimation (Brennan, 2001; Shavelson & Webb, 1991). This yields variance component estimates at the person-level (p), rater-level (r), and card-level (c), as well as all two-way interactions (e.g., *pr, pc,* and *cr*). The remaining residual variance is composed of error and the three-way interaction between person, rater, and card.

Measures

The TAT was administered in accordance with the procedures and guidelines outlined by Murray (1943). TAT cards were administered in the following sequence: 1, 5, 14, Picasso's La Vie ("Picasso card"), 13MF, 12M, 2, 18GF to all 158 subjects. Finally, Card 12F was only administered to female patients ($n = 87$) and 7BM only to male patients ($n = 71$). The Social

Cognition and Object Relations Scale-Global rating method (SCORS-G; Stein et al., 2011; Stein & Slavin-Mulford, 2018) is a rating system applied to narrative material that assesses facets of object relations and social cognition. The system is comprised of eight dimensions scored on a 7-point rating scale, with lower scores indicating more pathological responses and higher scores indicating more adaptive responses (see Table 1 for scale descriptions). Multiple dimensions have a default score: AFF (4), EIR (2), EIM (4), AGG (4), SE (4), and ICS (5), if the specific narrative does not contain content deemed relevant to that dimension. For instance, if the story does not mention the emotional state of the characters, it would be given a '4' (default score) on AFF for lack of affective content. A global score representing overall adaptation and maturity of object representations is calculated by averaging dimension scores across all eight SCORS-G dimensions (Siefert et al., 2016). Over two decades of empirical studies have identified significant associations between SCORS-G dimensions and clinical constructs related to personality psychopathology, interpersonal functioning, suicidality, and change over the course of clinical treatment (see Stein & Slavin-Mulford, 2018 for a review). For the present study, two undergraduate psychology students were trained as raters for the SCORS-G under the supervision of a psychologist with considerable clinical and research experience with the TAT and SCORS-G rating system. Raters were blind to all identifying information and participant diagnoses. Raters completed a nine session training seminar utilizing the training manual and practice protocols outlines by Stein and colleagues (Stein et al., 2011). At the end of the nine sessions, raters had met the desired reliability goal of intraclass correlation coefficients (ICC)

>.60 for all eight SCORS-G dimensions both with the expert protocol ratings provided by Stein

et al. (2011) as well as with each other. Raters then co-rated a subset of 51 TAT protocols from

the current study to establish interrater reliability; ICC values were calculated every 10-15

protocols to identify and address rater drift as needed and raters met periodically to discuss and

resolve coding issues. The remaining study protocols were divided randomly between the two

raters.

Results

Descriptive statistics and reliability

Means, standard deviations, and interrater reliability coefficients are listed in Tables 2

and 3. ICC estimates were calculated using SPSS Version 23, using a 2-way random-effects (2,

1) model with absolute agreement (see Table 2). Specific dimension ICC values for co-rated

protocols ranged from .58 (SC) to .82 (EIM) with an overall mean of .68 across the eight

SCORS-G dimensions, suggesting moderate-to-good levels of interrater reliability (cf., Cicchetti,

1994).

Variance component analyses for the eight SCORS-G dimensions for all co-rated

protocols (n=51) are reported in Table 4. Raters accounted for a small percentage of the variance

(ranging from 1% to 9%). Interactions between rater and card (r x c) and rater and participant (r

x p) generally contributed little variance. Consistent with past studies (Auletta et al., 2018;

Siefert et al., 2016; Stein et al., 2014), the majority of the variance for COM and SC was

accounted for by person effects (32% and 27%, respectively). For the affective-relational

dimensions, person by card interactions accounted for the largest proportion of variance, ranging from 26% for ICS to 58% for EIM.

Results by Individual TAT Cards

Following the procedure outlined by Siefert and colleagues (Siefert et al., 2016, p. 602), we evaluated card pull by computing two types of z scores: between-participant and within-participant (see Tables 5 and 6 for general results and Tables 7-10 for results by gender). To calculate between-participant z scores, an individual subject's raw score on a given dimension and card was subtracted from the overall sample mean and then divided by the overall sample's standard deviation. After calculating the z score for each participant's score on each card, these scores were then averaged to compute a z score for all dimensions for each cards. These z scores were then averaged across participants and a series of one-sample z tests were conducted ($M = 0$, $SD = 1$). For the within-participants approach, a subject's raw score on each card (e.g. COM on Card 10) was converted to a z score by subtracting the subject's dimensional mean score across the entire card set (e.g. COM mean score across all cards) from that score and then dividing that result by the subject's standard deviation across each cards (e.g. COM SD across all cards). Because we were interested in studying pull more generally (vs. examining how each card compared to every other individual card), we used a series of one-sample z tests. In this approach, each card's average between-participant score is compared to the mean for the sample (i.e., zero) to determine if the score is significantly higher or lower relative to the set average for that dimension. This approach was also repeated using the average within-participant z-scores for

each card. Given the multiple comparisons ($n = 90$), a Bonferroni correction was used to reduce Type 1 error (significance level set at $0.05/90 = .00056$). A card was determined to exert "pull" if it reached significance for both the between-participant and within-participant comparison. Inclusion of both types of analyses reduces the risk that differences, especially at the between-participant level, are due to a small number of outliers.

Card 1: *A young boy is contemplating a violin which rests on a table in front of him (Murray 1943)*

Card 1 showed a positive pull on the cognitive dimensions of COM and SC, carrying the highest mean scores for the entire sample on these dimensions. Card 1 was found to have a negative card pull for EIR, a negative trend for AGG and SE, and a positive trend for AFF. There was a significant positive pull in female subjects for SC, a positive trend for COM, and a negative trend for SE. There was a significant negative pull in male subjects for EIR.

Card 5: *A middle-aged woman is standing on the threshold a half-opened door looking into a room (Murray, 1943)*

Card 5 was the only card with no pull or trends across any dimension, either within male or female gender groups specifically or for the sample as a whole.

Card 14: *The silhouette of a man (or woman) against a bright window. The rest of the picture is totally black (Murray, 1943)*

Across the sample as a whole, Card 14 demonstrated a positive pull effect for AFF, positive trends for AGG and SE, and a significant negative pull for EIR. Similar to Cards 1 and

5, Card 14 features a single character, which may have contributed to lower EIR ratings. There were no notable differences within either gender group.

Picasso Card: *Two nude standing figures of a young man and woman. The woman rests her head on the man's shoulder. Beside them stands a draped woman with a baby in her arms (Morgan, 2003)*

The Picasso Card was largely neutral across SCORS-G dimensions, with the exception of a significant negative pull for EIM across the entire sample. It also received the lowest mean dimension score on SC (compared to all other cards) for the entire sample though this did not reach significance in terms of pull effects. There were no significant pull effects unique to either male or female subjects though male subjects did show a negative trend for EIM.

Card 13MF: *A young man is standing with downcast head buried in his arm. Behind him is the figure of a woman lying in bed (Murray, 1943)*

For the sample as a whole, Card 13MF showed the most frequent negative pull effects across dimensions, including negative pull for AFF, EIM, AGG, SE, ICS, and the global score. These pull effects were consistent within both gender groups, although the AGG dimension was not significant within female subjects. In response to Card 13MF, men and women both produced narratives that were lower in AFF, EIM, and SE relative to their group average dimension scores across cards.

Card 12M: *A young man is lying on a couch with his eyes closed. Leaning over him is the gaunt form of an elderly man, his hand stretched out above the face of the reclining figure (Murray,*

1943)

Like Card 5, Card 12M did not exhibit any significant pull effects. There was a negative trend for COM for the entire sample (showing the lowest mean dimension score across all cards). Within female subjects, there was a positive trend for ICS.

Card 2: *County scene: in the foreground is a young woman with books in her hand; in the background a man is working in the fields and an older woman is looking on (Murray, 1943)*

Card 2 showed a positive pull effect across the whole sample for the global score. There were also significant positive pull effects across the whole sample for AFF, EIM, AGG, and ICS, consistent with past findings (see Table 11). Within male subjects, a positive pull effect emerged for the global score, while within female subjects a positive trend for AFF and the global score was found.

Card 18GF: *A woman has her hands squeezed around the throat of another woman whom she appears to be pushing backwards across the banister of a stairway (Murray, 1943)*

Across the sample as a whole, Card 18GF showed significant negative pull effects for AFF, and negative trends for EIM, AGG, ICS, and the global score. There was additionally a positive trend for EIR. Within female subjects, a negative trend for AGG emerged, while within male subjects a positive trend for EIR was found.

Card 12F: *The portrait of a young woman. A weird old woman with a shawl over her head is grimacing in the background (Murray, 1943)*

Card 12F was generally neutral in terms of pull effects, with the exception of a significant positive pull for SE. This card obtained the highest mean SE ratings for female subjects.

Card 7BM: *A gray-haired man is looking a younger man who is sullenly staring into space (Murray, 1943)*

Card 7BM showed positive pull effects for AFF, EIR, and the global score. This card also had the highest mean dimension scores for AFF, EIR, and the global score for male subjects.

A full comparison of significant findings from the current study with card pull effect patterns obtained in prior studies for overlapping cards is presented in Table 11.

Discussion

We had three primary aims for this study. First, we examined sources of variance in SCORS-G dimensions to ascertain if findings from nonclinical and outpatient adult samples would extend to an adult residential treatment clinical population. While differences in magnitude of variance component estimates were observed, the overall pattern was largely consistent with prior work (Auletta et al., 2018; Siefert et al., 2016; Stein et al., 2014; see Table 11). Second, while five of the cards used in this study have been previously analyzed for pull effects (Cards 1, 2, 12M, 13MF, and 14), we aimed to expand on this existing literature by examining cards that have not previously been analyzed but are nonetheless relatively common in use in clinical practice and research (Aronow, Weiss, & Reznikoff, 2001; Bellak & Abrams, 1997, Cramer, 2017). Finally, we investigated card pull effects within different gender groups, a particularly important issue given that certain TAT cards (e.g. 12M or 18GF) were recommended

for use by Murray (1943) based on the examinee's gender. The current findings are the first to our knowledge to provide insight into differences in card pull effects within different gender groups for the SCORS-G system.

Similar to past studies on the TAT and Picture Story Exercise (Auletta et al., 2018; O'Gorman et al., 2020; Siefert et al, 2016; Stein et al, 2014), we found greater stability of variance at the person level for the cognitive variables and greater responsiveness to task (card x person effects) in affective-relational variables. Thus, even in a population with high levels of clinical severity and chronicity, people were still relatively consistent across cards in terms of how they described and represented mental states (COM) and organized the relational sequences and social logic of their narratives (SC). These features of narrative formation appear to be more "trait-like" in nature and shaped less by the specific card content used to elicit narratives. In contrast, the affective-relational dimensions all varied more as a function of the interaction between persons and cards.

Regarding card pull, the three cards that exerted the strongest pull effects were 13MF (negative pull) and 2 (positive pulls) and 7BM (positive pull for male subjects). Card 13MF pulled for hostile, destructive themes, including intimate partner violence, murder, suicide, and sexual assault. Our findings of a sweeping negative pull effect for this card replicate those of Stein and colleagues (2014) who also found that 13MF showed the greatest negative pull across all SCORS-G dimensions. In contrast, Card 2 elicited the highest ratings across all dimensions, especially for AFF, EIM, AGG, and ICS. These findings are consistent with past studies by that

showed positive pull effects for Card 2 on AFF (Siefert et al., 2016; Stein et al., 2014), EIR (Siefert et al., 2016; Stein et al., 2014), EIM (Stein et al., 2014), SE (Siefert et al., 2016), and ICS (Auletta et al., 2018; Siefert et al., 2016; Stein et al., 2014). These findings suggest that particularly negative stories on Card 2 (e.g. a woman who is being forced into farm labor by her oppressive parents) could be considered highly unusual and might representing someone who has difficulty imagining positive relational scenarios even when provided with neutral or positive stimuli. In contrast, a negative story on Card 13MF (e.g. a sexual encounter that turns abusive) should be considered typical given these convergent findings across studies. However, if a participant were to tell a love story between a man and woman (i.e. high scores for AFF and EIR) then it might raise questions about the possible avoidance of troublesome thoughts and feelings in response to a negative stimulus.

Findings for other cards were more variable and reflected both convergent and divergent results compared to prior studies. For example, Card 12M has been included in only one prior card pull study (Stein et al., 2014), which only found evidence of pull for higher EIR. Our study did not find positive pull on this dimension, though it did identify a negative trend for COM. Our study also found a negative pull for EIR on Card 1 in contrast to Siefert et al.'s (2016) findings, which found a positive pull for EIR. Given that our study included an adult clinical population marked by high rates of psychopathology (compared to the undergraduate sample in Siefert et al. [2016]), it is possible that the image of boy alone with the violin conjured feelings of aloneness or activated experiences of caregivers' absence, pulling for lower EIR scores in our clinical

sample. A nonclinical sample with presumably more positive internalized representations of others might have been more inclined to tell stories of teachers or parents who came to the child's aid and helped him with the violin (i.e. higher EIR scores),

As noted above, we explored pull effects in five new cards in the current study (5, Picasso, 18GF, 12F, and 7BM). Card 5 did not exhibit significant card pull effects for any SCORS-G dimension, joining the ranks of other cards in prior card pull studies that have been identified as neutral or limited in terms of pull (e.g., Card 4 [Stein et al., Siefert et al., 2016, Auletta et al., 2018]; 13B [Siefert et al., 2016]; 16 [Auletta et al., 2018]). The Picasso Card similarly appeared to be mostly neutral in terms of card pull. The low overall SC dimension mean could be explained by the complicated social situation featured on the card, which often elicits complex sexual plots that can lead to breakdowns in thinking.

Card 18GF exerted a negative pull on AFF and a negative trend for EIM, AGG, ICS, and the global score and a positive trend for EIR. Although Murray (1943) originally described the picture as featuring one woman choking another, our study found only a non-significant negative trend for AGG. Based on our qualitative analysis, the narratives often featured a dysphoric story of either loss or aggression (negative pull for AFF). At times, participants often told a story that featured a caregiver who was trying to support someone who was sick or ill (positive rating for EIR). Alternatively, the stories sometimes featured more explosive confrontations that often turned violent (negative ratings AFF, EIR, EIM, AGG, ICS, and EIR).

Card 7BM (administered only to male subjects), believed to represent the subject's attitude towards authority (Rapaport, Gill, & Schafer, 1946), was a more positive card on the dimensions of AFF, EIR, and the global score. This finding contrasts with early research on the TAT which found that examinees tend to generate stories on this card with a more neutral to sad affect tone (Eron, 1950). Card 12F, though only administered to female participants, also was largely neutral in terms of pull effects, with the exception of more adaptive ratings for SE. It is possible that this stimulus elicits more self-reflective stories that pull for aspirational narratives, given that the woman in the background is sometimes perceived as the woman in the foreground's future self.

This is the first study to our knowledge that has studied card pull effects within male and female subject groups. While several studies have provided evidence that some characteristics of narratives vary as a function of person by card interactions, no prior study has sought to examine how pull may be exerted *within* groups with different demographic characteristics. Within male and female subject groups, certain TAT cards were characterized by different patterns of pull effects (e.g. Cards 1, 13MF, 2, and 18GF) and trends (e.g. Picasso Card and 12M). For Card 1 (a card that features a young boy with a violin), we found that women produced more complex narratives with intricate plots (positive pull for SC) and a positive trend for the complexity of the characters' mental states (COM) relative to their stories on other cards; this card also pulled for lower SE in female subjects compared to other cards in the protocol. In contrast, Card 1 showed negative pull effects for male subjects on the EIR dimension, suggesting that male subjects were

less likely to evoke images of mutuality and caring between characters on this card compared to other cards in the protocol. It is possible that the male protagonist of Card 1 evoked feelings of aloneness (a feature that is rated lower on EIR) for male subjects, who might be more likely to identify with the young boy. Alternatively, it might be that men are more likely to identify with the boy and thus were less compelled to introduce additional characters. Together, these patterns of findings for Card 1 may suggest a pull for ruminative narratives focused on feelings of self-doubt in female examinees, while male examinees may be more likely to create stories about social isolation and feelings of loneliness.

There were some differences in patterns of aggressive content between men and women. While Card 13MF pulled for narratives rated lower in AFF, EIM, SE, and ICS within both gender groups, male subjects also showed a pull for lower AGG on this card compared to their stories on other cards. The man pictured in the card appears distraught and is depicted in a scene that raises the possibility that he may have actively engaged in violence or shameful activity. This may pull male respondents, who may implicitly identify with the character to tell stories involving more poorly controlled impulses and aggression. The female in this card is in contrasted depicted in a passive position (possibly as the victim of violence). Unlike men, women did not respond to this particular card with narratives rated higher in AGG; instead, women were more likely to generate narratives rated higher in AGG in response to Card 18GF compared to their narratives for other cards (though this was not the finding amongst men). One hypothesis based on pull effect patterns for men and women on these cards may be that

depictions of violence are more likely to pull for narratives involving poorly controlled

aggression when the gender of the protagonist is the same as that of the respondent. Similarities

in gender may increase a sense of evocativeness and ownership over the character's actions,

leading to more disinhibited actions regulated less by reflective processes.

Cards 12F and 7BM, which have historically been administered only to women and men

respectively at the residential treatment facility, differed in their card pull effect patterns. Within

men, Card 7BM pulled for significantly more adaptive stories across several SCORS-G

dimensions. Further, Card 7BM led men to produce narratives with themes of relationships,

positive interactions, and interpersonal communication more frequently than other cards in the

protocol. Though Card 12F depicts two women, the narratives of female subjects for this card

were rated as largely neutral, though the card evoked themes related to self-esteem more

frequently than other cards in the protocol did.

Limitations

There were several limitations in the present study. First, our study featured a high

socioeconomic status and racially homogenous sample (92.4% European American) which,

while representative of the population at the treatment facility, is not representative of broader

clinical or community populations. That said, our findings mirror many results of earlier studies

that featured more diverse samples (e.g., Siefert et al., 2016), especially on Cards 2 and 14 (in

comparison to Siefert et al., 2016). Although we utilized subject self-identification of male and

female gender for creating subgroups for analyses in our study, we recognize that relying upon

traditional binary categories is not consistent with contemporary knowledge about gender and gender expression. Future studies should include a more nuanced assessment of gender identity and other potentially relevant intersectional dimensions, and examine the relevance of these factors for TAT card pull effects. Finally, estimates for rater by person interaction effects accounted for 16% of the variance in COM and 21% of the variance in SC, while in prior studies (Auletta et al., 2018; Siefert et al., 2016; Stein et al., 2014) rater by person effects ranged only from < 1% to 6% across all SCORS-G dimensions. One possible explanation for this finding is that rater agreement (i.e., ICCs) were lower in the current study for COM and SC relative to prior studies (e.g., ICC estimates ranged from .79 to .90 for Stein et al., [2014], .79 to .92 for Siefert et al., [2016], .78 to .84, and for Auletta et al., [2018]). While level of interrater agreement was acceptable in the current study (.64 and .58 for COM and SC, respectively), lower agreement for these two dimensions may have contributed to larger variance component estimates for the rater by person interaction for these two subscales. While the variance component results in the current study are consistent with those from prior studies regarding the cognitive SCORS-G dimensions, future studies with greater consistency in interrater agreement are needed to assess the replicability and robustness of this finding across diverse samples.

Conclusion and Future Directions

The current study offers several new and potentially important findings to the existing TAT and SCORS-G literature, including general replication of pull effect patterns for previously studied cards in a more clinically severe population, novel findings on pull effects for cards not

previously studied, and findings suggesting differential pull effect patterns related to participant's gender. Future research should explore the impact of administration order on the respondents' narrative. For instance, in our study, Card 12M was found to have a negative trend for COM (i.e. characters' mental states were less elaborated) and was always administered after Card 13MF (the most pathological card in our simple). It is possible that, after telling a story with more disturbing content (13MF), that respondents might shut down and offer a blander, less sophisticated narrative. Future studies investigating the impact of the card order, cognitive fatigue, and potential defensive processes across card sequence might deepen our understanding of respondents' stories and the SCORS-G system. Second, a major issue in TAT research is the wide variation in card set selections across sites, which are often chosen based on the traditions of the clinical site, clinician preferences, and/or feasibility. We advocate for greater movement toward a universal "core" card set of four to five cards which would allow for clearer comparisons and more empirically-grounded interpretation of findings across both clinical and research settings. Further, psychologists could select cards that are known to have adaptive (e.g. Card 2), neutral (e.g. Cards 12M or 5), and pathological (e.g. Card 13MF) pull effects, as it may provide the subject with a range of opportunities to craft narratives that demonstrate the relative rigidity or flexibility of their social cognitive capacities and object relations (Clemence & Lewis, 2018). If a subject consistently tells negatively valanced stories on cards that are known to pull for more neutral or adaptive SCORS-G ratings, it may highlight the degree of rigidity of the subject's negative relational schemas and their potential difficulty in shifting their interpersonal

stance across interpersonal scenarios. Finally, future studies should seek to expand understanding of the impact of gender on participants' responses to different TAT cards, conducting direct comparisons of pull effects between (as opposed to within) gender groups and using a more dimensional approach to gender conceptualization and examining card pull effect patterns in individuals identifying as transgender, non-binary, and gender-fluid.

The present study contributes additional evidence supporting the importance of considering card pull effects in the analysis and interpretation of SCORS-G ratings on the TAT. Our findings expand knowledge related to specific TAT cards as well as typical pull effect patterns within different gender groups. These findings provide knowledge that may improve the precision of clinical decision-making during both card set selection and interpretation of individual participant results, and point to future areas of research for further expanding knowledge of card pull effects and the SCORS-G.

References

Aronow, E., Weiss, K. A., & Reznikoff, M. (2001). *A practical guide to the Thematic Apperception Test: The TAT in clinical practice*. New York, NY: Routledge.

Auletta, A. F., Cupellaro, S., Abbate, L., Aiello, E., Cornacchia, P., Norcia, C., & Sogos, C. (2018). SCORS-G and card pull effect of TAT stories: A study with a nonclinical sample of children. *Assessment*, 1073191118781014.

Bellak, L., & Abrams, D. M. (1997). *The T.A.T., C.A.T., and S.A.T. in clinical use (6th ed.)*. Boston, MA: Allyn & Bacon.

Bram, A. D. (2014). Object relations, interpersonal functioning, and health in a nonclinical

sample: Construct validation and norms for the TAT SCORS-G. *Psychoanalytic*

Psychology, *31*(3), 314.

Brennan, R. L. (2001). *Generalizability Theory*. New York, NY: Springer-Verlag.

Buer Christensen, T., Eikenaes, I., Hummelen, B., Pedersen, G., Nysæter, T.-E., Bender, D. S.,

Skodol, A. E., & Selvik, S. G. (2020). Level of personality functioning as a predictor of

psychosocial functioning—Concurrent validity of criterion A. *Personality Disorders:*

Theory, Research, and Treatment, 11(2), 79–90. https://doi.org/10.1037/per0000352

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and

standardized assessment instruments in psychology. *Psychological Assessment, 6*(4),

284-290.

Clemence, A. J., & Lewis, K. (2018). Flexibility and rigidity in object relational functioning:

Assessing change in suicidal ideation and global psychiatric functioning using the

SCORS–G. *Journal of Personality Assessment*, *100*(2), 135-144.

Cramer, P. (2017). Defense mechanism card pull in TAT stories. *Journal of Personality*

Assessment, *99*(1), 15-24.

Cramer, P. (1991). *The development of defense mechanisms: Theory, research and assessment.*

New York, NY: Springer-Verlag.

Eron, L. D. (1950). A normative study of the Thematic Apperception Test. *Psychological*

Monographs, 64(9), 1–47.

Kelly, F. D. (1999). *The psychological assessment of abused and traumatized children*. Mahwah,

NJ: Lawrence Erlbaum Associates.

Lewis, K. C., Meehan, K. B., Cain, N. M., Wong, P. S., Clemence, A. J., Stevens, J., & Tillman,

J. G. (2016). Impairments in object relations and chronicity of suicidal behavior in

individuals with borderline personality disorder. *Journal of Personality Disorders*, *30*(1),

19-34.

Mihura, J. L., Roy, M., & Graceffo, R. A. (2017). Psychological assessment training in clinical

psychology doctoral programs. *Journal of Personality Assessment*, *99*(2), 153-164.

Morgan, W. G. (2003). Origin and history of the" Series B" and" Series C" TAT pictures.

Journal of Personality Assessment, *81*(2), 133-148.

Murray, H. (1943). *Thematic Apperception Test manual*. Cambridge, MA: Harvard University

Press.

O'Gorman, E. T., Cobb, H. R., Galtieri, L. R., & Kurtz, J. E. (2020). Stimulus characteristics in

picture story exercise cards and their effects on the social cognition and object relations

scale–global rating method. *Journal of Personality Assessment*, *102*(2), 250-258.

Peterson, C. A., & Schilling, K. M. (1983). Card pull in projective testing. *Journal of Personality

Assessment*, *47*(3), 265-275.

Pilkonis, P. A., Heape, C. L., Ruddy, J., & Serrao, P. (1991). Validity in the diagnosis of

personality disorders: The use of the LEAD standard. *Psychological Assessment*, *3*(1),

46-54.

Rapaport, D. (1952). Projective techniques and the theory of thinking. *Journal of Projective*

Techniques, 16(3), 269-275.

Rapaport, D., Gill, M. M., & Schafer, R. (1946). *Diagnostic psychological testing.* Chicago,

IL: Year Book.

Shavelson, R. J., & Webb, N. M. (1991). *Generalizability theory: A primer.* Newbury Park, CA:

Sage Publications.

Siefert, C. J., Stein, M. B., Slavin-Mulford, J., Sinclair, S. J., Haggerty, G., & Blais, M. A.

(2016). Estimating the effects of Thematic Apperception Test card content on SCORS–G

ratings: Replication with a nonclinical sample. *Journal of Personality Assessment, 98*(6),

598-607.

Siefert, C. J., Stein, M. B., Slavin-Mulford, J., Sinclair, S. J., Haggerty, G., Sinclair, S. J., Funke,

D., & Blais, M. A. (2018). Exploring the factor structure of the Social Cognition and

Object Relations – Global Rating Method: Support for two- and three- factor models.

Journal of Personality Assessment, 100, 122 – 134. Doi:

10.1080/00223891.2017.1336716.

Spitzer, R. L. (1983). Psychiatric diagnosis: Are clinicians still necessary? *Comprehensive*

Psychiatry, 24(5), 399–411.

Stein, M. B., Hilsenroth, M., Slavin-Mulford, J., & Pinsker, J. (2011). Social Cognition and

Object Relations Scale: Global Rating Method (SCORS–G; 4th ed.). Unpublished

manuscript, Massachusetts General Hospital and Harvard Medical School, Boston, MA.

Stein, M. B., & Siefert, C. J. (2018). Introduction to the special section on the Social Cognition

and Object Relations Scale–Global Rating Method: From research to practice. *Journal of Personality Assessment*, *100*(2), 117-121.

Stein, M., & Slavin-Mulford, J. (2018). *The Social Cognition and Object Relations Scale-Global Rating Method (SCORS-G): A comprehensive guide for clinicians and researchers*. New York, NY: Routledge.

Stein, M. B., Slavin-Mulford, J., Sinclair, S. J., Siefert, C. J., & Blais, M. A. (2012). Exploring the construct validity of the social cognition and object relations scale in a clinical sample. *Journal of personality assessment*, *94*(5), 533-540.

Stein, M. B., Slavin-Mulford, J., Siefert, C. J., Sinclair, S. J., Renna, M., Malone, J., Bello, I., & Blais, M. A. (2014). SCORS–G stimulus characteristics of select Thematic Apperception Test cards. *Journal of Personality Assessment*, *96*(3), 339-349.

Stein, M. B., Slavin-Mulford, J., Sinclair, S. J., Siefert, C. J., & Blais, M. A. (2012). Exploring the construct validity of the Social Cognition and Object Relations Scale in a clinical sample. *Journal of Personality Assessment, 94*(5), 533–540.

Westen, D. (1995). *Social Cognition and Object Relations Scale: Q-sort for projective stories (SCORS–Q)*. Unpublished manuscript, Department of Psychiatry, The Cambridge Hospital and Harvard Medical School, Cambridge, MA.

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Table 1.
Description of the SCORS-G dimensions

Dimension	Abbreviation	Description
Complexity of Representations of People	COM	The mental boundaries and complexity of mental states of self and other
Affective Quality of Representations	AFF	The affective quality of relational experiences and expectations
Emotional Investment in Relationships	EIR	The emotional sharing and reciprocity in relationship
Emotional Investment in Values and Moral Standards	EIM	The investment in conventional moral standards
Understanding of Social Causality	SC	The capacity to realistically understand and predict the correlates and consequences of social behaviors
Experience and Management of Aggressive Impulses	AGG	The capacity for adaptive expression and management of aggression
Self-Esteem	SE	Realistic self-appraisal and sense of self-worth
Identity and Coherence of Self	ICS	The stability and coherence of self-concept

Table 2.
Mean SCORS-G dimension scores and reliability coefficients

	M	*SD*	ICC (2,1)
COM	2.92	0.61	0.64
AFF	3.38	1.26	0.80
EIR	2.74	0.90	0.71
EIM	3.67	0.83	0.82
SC	2.95	0.81	0.58
AGG	3.54	0.78	0.67
SE	3.69	0.78	0.60
ICS	4.50	0.94	0.59
Global	3.43	0.52	

Note. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score). Potential scores range from 1 (more pathological) to 7 (more adaptive) for each dimension and global score. ICC (2,1) = Two-way random effects model with absolute agreement.

Table 3.

Means and Standard Deviations of SCORS-G dimensions and global score by card

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global[c]
1	3.12 (.54)	3.75 (.90)	2.45 (.63)	3.89 (.39)	3.18 (.81)	3.44 (.64)	3.54 (.83)	4.44 (.88)	3.48 (.40)
5	2.95 (.50)	3.48 (1.00)	2.68 (.76)	3.77 (.58)	2.88 (.74)	3.63 (.60)	3.80 (.56)	4.69 (.66)	3.48 (.40)
14	2.81 (.63)	3.78 (1.14)	2.23 (.60)	3.76 (.60)	2.81 (.74)	3.72 (.64)	3.90 (.97)	4.62 (1.06)	3.45 (.49)
Pic	2.96 (.59)	3.19 (.84)	2.95 (.58)	3.39 (.84)	2.79 (.73)	3.50 (.57)	3.59 (.63)	4.42 (.80)	3.35 (.36)
13MF	2.94 (.58)	2.58 (1.25)	2.80 (1.00)	3.27 (1.10	2.85 (.70)	3.28 (.96)	3.28 (.75)	4.04 (.99)	3.13 (.57)
12M	2.75 (.61)	3.51 (1.40)	2.98 (.85)	3.69 (.82)	2.88 (.77)	3.65 (.72)	3.84 (.63)	4.71 (.69)	3.50 (.50)
2	2.95 (73)	3.82 (.94)	2.98 (.76)	3.91 (.41)	3.10 (.96)	3.79 (.41)	3.90 (.73)	4.83 (.92)	3.66 (.43)
18GF	2.95 (.62)	2.75 (1.46)	3.07 (1.21)	3.37 (1.23)	2.95 (.84)	3.29 (1.13)	3.56 (.73)	4.14 (1.04)	3.26 (.70)
12F[a]	2.77 (.65)	3.56 (1.22)	2.91 (.87)	3.65 (.80)	2.96 (.86)	3.75 (.59)	3.99 (.85)	4.65 (.89)	3.53 (.52)
7BM[b]	2.84 (.63)	3.98 (1.21)	3.37 (.82)	3.72 (.72)	3.03 (.81)	3.75 (.50)	3.89 (.78)	4.71 (.86)	3.66 (.45)

Note. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score). Potential scores range from 1 (more pathological) to 7 (more adaptive) for each dimension and global score. Cards 1-18GF were administered to all 158 subjects. [a]Card 12F was only administered to female subjects (n = 87). [b]Card 7BM was only administered to male subjects (n = 71). [c]Global score was calculated by averaging all eight dimensions into a single score.

Table 4

Variance component estimates for the SCORS–G dimensions

	COM				AFF				EIR				EIM			
	df	MS	s^2	%	df	MS	s^2	%	df	MS	s^2	%	df	MS	s^2	%
Person (P)	50	3.87	0.16	32%	50	4.00	0.11	7%	50	2.30	0.07	8%	50	1.48	0.03	6%
Rater (R)	1	5.04	0.01	2%	1	1.83	0	<1%	1	39.74	0.09	9%	1	0.01	0	<1%
Card (C)	8	0.51	0.00	<1%	8	23.79	0.20	14%	8	11.96	0.10	12%	8	4.03	0.03	5%
P x C	400	0.33	0.08	15%	400	1.75	0.67	46%	400	0.95	0.33	36%	400	0.85	0.34	58%
R x C	8	0.28	0.00	<1%	8	1.81	0.03	2%	8	0.70	0.01	1%	8	0.19	0.00	<1%
P x R	50	0.87	0.08	16%	50	0.75	0.04	3%	50	0.41	0.01	1%	50	0.15	0	<1%
P x R x C, E	400	0.18	0.18	35%	400	0.41	0.41	28%	400	0.30	0.30	33%	400	0.18	0.18	30%

	SC				AGG				SE				ICS			
	df	MS	s^2	%	df	MS	s^2	%	df	MS	s^2	%	df	MS	s^2	%
Person (P)	50	5.83	0.22	27%	50	1.02	0.01	1%	50	2.66	0.11	14%	50	3.63	0.14	15%
Rater (R)	1	18.98	0.04	5%	1	8.44	0.02	3%	1	1.96	0.00	<1%	1	26.51	0.05	6%
Card (C)	8	1.69	0.01	1%	8	2.87	0.02	4%	8	8.61	0.08	10%	8	6.96	0.05	5%
P x C	400	0.47	0.12	15%	400	0.68	0.24	46%	400	0.78	0.22	29%	400	0.89	0.25	26%
R x C	8	0.91	0.01	2%	8	0.25	0.00	<1%	8	0.54	0.00	1%	8	1.41	0.02	2%
P x R	50	1.72	0.17	21%	50	0.44	0.03	5%	50	0.48	0.02	2%	50	0.68	0.03	3%
P x R x C, E	400	0.23	0.23	30%	400	0.21	0.21	41%	400	0.34	0.34	44%	400	0.40	0.40	43%

Note. df = degrees of freedom; MS = mean squares; s^2 = variance component estimate based on this sample; % = proportion of variance attributed to this source; e = error.

Card Pull Effects of the TAT

Table 5

Mean z-scores (between-participant) by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.33*	0.27	-0.37*	0.32*	0.32*	-0.19	-0.23	-0.11	0.08
5	0.07	0.06	-0.15	0.13	-0.07	0.08	0.12	0.19	0.10
14	-0.18	0.33*	-0.66*	0.12	-0.16	0.22	0.27*	0.17	0.06
Pic	0.11	-0.15	0.17	-0.28*	-0.18	-0.06	-0.11	-0.07	-0.13
13MF	0.04	-0.68*	0.00	-0.48*	-0.10	-0.39*	-0.58*	-0.49*	-0.59*
12M	-0.26	0.08	0.18	0.07	-0.08	0.14	0.17	0.22	0.13
2	0.04	0.34*	0.20	0.35*	0.20	0.33*	0.26	0.34*	0.44*
18GF	0.04	-0.49*	0.27	-0.31*	0.00	-0.35*	-0.15	-0.38*	-0.32*
12F	-0.26	0.13	0.09	0.01	0.04	0.23	0.37*	0.20	0.18
7BM	-0.06	0.47*	0.64*	0.08	0.14	0.23	0.30	0.21	0.45*

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 90 comparisons at .05 level.

Card Pull Effects of the TAT

Table 6

Mean z-scores (within-participant) by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.38*	0.28*	-0.41*	0.25	0.44*	-0.35*	-0.35*	-0.26	-0.02
5	0.06	0.05	-0.17	0.09	-0.12	0.04	0.15	0.10	0.06
14	-0.20	0.39*	-0.80*	0.13	-0.21	0.29*	0.26	0.08	0.08
Pic	0.13	-0.17	0.20	-0.38*	-0.21	-0.14	-0.08	0.15	-0.17
13MF	0.04	-0.77*	0.07	-0.48*	-0.09	-0.39*	-0.62*	-0.45*	-0.70*
12M	-0.34*	0.08	0.23	0.05	-0.15	0.20	0.24	0.03	0.18
2	0.01	0.35*	0.23	0.32*	0.24	0.30*	0.24	0.28*	0.46*
18GF	0.05	-0.51*	0.32*	-0.19	0.01	-0.18	-0.18	-0.11	-0.25
12F	-0.31	0.11	0.04	0.06	-0.07	0.28	0.40*	0.29	0.19
7BM	-0.02	0.55*	0.67*	0.11	0.31	0.15	0.22	0.18	0.61*

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 90 comparisons at .05 level.

Table 7

Mean z-scores (between-participant) for female subjects by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.35	0.30	-0.25	0.31	0.37*	-0.18	-0.29	-0.09	0.07
5	0.14	0.09	-0.04	0.20	0.00	0.03	0.11	0.20	0.09
14	-0.23	0.32	-0.65*	0.12	-0.21	0.23	0.26	0.13	0.01
Pic	0.14	-0.17	0.17	-0.27	-0.18	-0.08	-0.08	-0.02	-0.07
13MF	0.02	-0.74*	0.07	-0.47*	-0.09	-0.24	-0.67*	-0.61*	-0.37*
12M	-0.26	0.18	0.16	0.12	-0.13	0.18	0.21	0.32	0.11
2	-0.05	0.34	0.19	0.32	0.22	0.30	0.28	0.32	0.25
18GF	0.02	-0.49*	0.22	-0.32	0.06	-0.49*	-0.14	-0.45*	-0.22
12F	-0.32	0.05	0.02	-0.05	-0.07	0.18	0.31	0.17	0.04

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 81 comparisons at .05 level.

Card Pull Effects of the TAT

Table 8

Mean z-scores (within-participant) for female subjects by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.43*	0.33	-0.27	0.24	0.59*	-0.38*	-0.39*	-0.23	0.07
5	0.16	0.09	-0.01	0.10	-0.02	-0.07	0.11	0.19	0.11
14	-0.26	0.38*	-0.76*	0.11	-0.32	0.28	0.27	0.19	0.06
Pic	0.17	-0.16	0.21	-0.29	-0.25	-0.12	0.01	0.00	-0.12
13MF	0.02	-0.80*	0.14	-0.43*	-0.10	-0.25	-0.72*	-0.67*	-0.72*
12M	-0.34	0.20	0.22	0.07	-0.21	0.23	0.25	0.38*	0.26
2	-0.08	0.38*	0.20	0.35	0.30	0.31	0.29	0.33	0.46*
18GF	-0.01	-0.49*	0.22	-0.21	0.08	-0.28	-0.19	-0.47*	-0.30
12F	-0.34	0.07	0.03	0.05	-0.06	0.27	0.40*	0.30	0.17

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 81 comparisons at .05 level.

Card Pull Effects of the TAT

Table 9

Mean z-scores (between-participant) for male subjects by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.27	0.22	-0.54*	0.34	0.21	-0.20	-0.19	-0.14	-0.01
5	-0.08	-0.04	-0.30	0.05	-0.17	0.11	0.10	0.16	-0.02
14	-0.11	0.36	-0.67*	0.13	-0.07	0.22	0.27	0.18	0.09
Pic	0.01	-0.16	0.18	-0.27	-0.17	-0.02	-0.17	-0.15	-0.17
13MF	0.05	-0.62*	-0.10	-0.49*	-0.09	-0.59*	-0.46*	-0.37	-0.60*
12M	-0.28	-0.08	0.18	0.00	-0.01	0.09	0.11	0.10	0.03
2	0.15	0.30	0.23	0.33	0.15	0.30	0.18	0.29	0.41*
18GF	0.03	-0.47*	0.35	-0.27	-0.07	-0.11	-0.16	-0.28	-0.24
7BM	-0.02	0.51*	0.67*	0.12	0.23	0.20	0.31	0.20	0.50*

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 81 comparisons at .05 level.

Card Pull Effects of the TAT

Table 10

Mean z-scores (within-participant) for male subjects by SCORS–G dimension

Card	COM	AFF	EIR	EIM	SC	AGG	SE	ICS	Global
1	0.27	0.24	-0.61*	0.27	0.24	-0.30	-0.26	-0.29	-0.14
5	-0.09	-0.04	-0.37	0.07	-0.25	0.15	0.20	0.24	-0.03
14	-0.13	0.41*	-0.81*	0.16	-0.07	0.31	0.25	0.21	0.11
Pic	0.04	-0.19	0.21	-0.46*	-0.16	-0.18	-0.16	-0.16	-0.24
13MF	0.06	-0.70*	-0.03	-0.53*	-0.07	-0.57*	-0.49*	-0.39	-0.67*
12M	-0.36	-0.08	0.22	0.02	-0.07	0.16	0.23	0.14	0.07
2	0.15	0.32	0.27	0.23	0.16	0.26	0.16	0.29	0.42
18GF	0.08	-0.51*	0.44*	-0.14	-0.08	0.00	-0.16	-0.24	-0.13
7BM	-0.02	0.55*	0.67*	0.11	0.31	0.15	0.22	0.18	0.61*

Note. Pic = Picasso card. COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; Global = Global Rating (composite score).

*Suggests significant at .0006 level based on Bonferroni correction with 81 comparisons at .05 level.

Table 11.

Comparison of current findings with prior studies

Card	Stein et al. (2014)	Siefert et al. (2016)	Auletta et al. (2018)	Current
Sample	Clinical Adult	Undergraduate Adult	Nonclinical Children	Clinical Adult
1	N	+EIR; -SE	+COM, SC, SE, global	+COM, SC; -EIR
2	+AFF, EIR, EIM, ICS, global	+AFF, EIR, SE, ICS, global	+ICS	+AFF, EIM, AGG, ICS, global
12M	+EIR	n/a	n/a	N
13MF	-AFF, EIM, AGG, SE, ICS, global	n/a	n/a	-AFF, EIM, AGG, SE, ICS, global
14	+AFF, EIM	+AFF, SC, AGG -EIR	n/a	+AFF -EIR

Note. N = neutral (no card pull effects on any SCORS-G dimension); + = positive pull effect (more adaptive ratings); - = negative pull effects (more pathological ratings); n/a = card not included in study; COM = Complexity of Representation of People; AFF = Affective Quality of Representations; EIR = Emotional Investment in Relationships; EIM = Emotional Investment in Values and Moral Standards; SC = Understanding of Social Causality; AGG = Experience and Management of Aggressive Impulses; SE = Self-Esteem; ICS = Identity and Coherence of Self; global = Global Rating (composite score).