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Development of a Social Emotional Information Processing Assessment for Adults (SEIP-Q)

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Abstract

An expanded self-report, vignette-based, questionnaire was developed to assess five components in a social emotional information processing model (SEIP: attribution, emotional response, response valuation, outcome expectancy, response efficacy, and response enactment), first in a population-based sample (n = 250) and, second in healthy control participants (n = 50) and in those with DSM-5 Intermittent Explosive Disorder (IED: n = 50). SEIP-Q vignettes depict, separately, both overtly aggressive and relationally aggressive socially ambivalent scenarios. This expanded SEIP-Q assessment demonstrated good internal reliability, as well as convergent and discriminant validity, for all five SEIP components. IED participants differed from healthy controls in all SEIP-Q components. This expanded SEIP-Q assessment is thus proposed as a reliable and valid method for studying the various stages of SEIP in adult human subjects.

Keywords

social emotional information processing; hostile attribution; negative emotion; aggression

INTRODUCTION

Aggression in humans is a complex and multi-determined behavior that is influenced by a variety of factors including biological, situational, and psychological processes. Social information processing theory of aggression proposes that cognitive processes such as attribution and response access influence whether an individual will behave aggressively in a given situation (Dodge, 1986). A model developed from this theory identifies a number of cognitive biases that may each increase the tendency to respond aggressively to some event or situation (Dodge & Crick, 1990). First, an individual *encodes* situational cues including cues involving others' cognitive and emotional states, as well as their own internal emotional cues. Second, cues are *interpreted* and attributions are made. These can include causal attributions about an event and attributions about another person's intent. Third, *goals* in the situation are considered. Goals may include maintaining a friendship or retaliating against a perceived insult. Fourth, potential *responses* to the situation are generated. Individuals vary

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in the number and nature of responses they generate in a particular situation (e.g., the number of aggressive and prosocial responses generated). Fifth, decision-making processes are engaged in selecting a response. These processes include response evaluation, outcome expectations, and evaluation of self-efficacy in carrying out the response. Finally, a response is chosen and *enacted*. The chosen response may be highly familiar and rehearsed or it may be novel. Additionally, the response may be carried out more or less skillfully.

Dodge and Crick (Dodge & Crick, 1990), and others, have tested this theory extensively to examine whether certain biases in these cognitive processes are characteristic of children who are aggressive. Understanding these biases could then inform interventions aimed at reducing aggressive behavior in children. Empirical studies show the most support for hostile attributional bias, response evaluation biases in aggressive children. Specifically, studies show that aggressive children interpret the behavior of others as more hostile (Dodge & Coie, 1987; Milich & Dodge, 1984), evaluate aggressive responses to situations more favorably (Asarnow & Callan, 1985), expect more favorable outcomes for aggressive behavior (Crick & Dodge, 1989; Perry, Perry, & Rasmussen, 1986), and have greater self-efficacy for carrying out aggressive behavior (and lower self-efficacy for inhibiting aggressive behavior; Crick & Dodge, 1989) compared to their non-aggressive peers. Subsequent modification of SIP theory (Lemerise & Arsenio, 2000) has incorporated emotional factors such as emotionality, baseline mood, and emotion regulation. We refer to this updated model as a social-emotional information processing (SIEP) model. This addition reflects what we know about the role of negative affect in aggressive behavior (Berkowitz, 1990; Verona, Patrick, & Lang, 2002) as well as evidence that aggressive individuals have more trait anger (McCloskey et al., 2006), emotional lability (Fettich, McCloskey, Look, & Coccaro, 2014), and greater physiological reactivity (Patrick, 2008).

Social information processing theory was initially developed to better understand aggression in children. While studies show that aggressive adults exhibit cognitive and emotional biases (Eckhardt & Cohen, 1997), little research in this area has been conducted within the framework of the social information processing model (but see Lim & Casey, 2011). For example, studies in adults have shown that angry and aggressive individuals: a) show attentional bias toward aggression-themed words (even when irrelevant to the assigned task) in dot-probe and emotional Stroop tasks (Cohen, Christopher & Schagat, 1998; Eckhardt & Cohen, 1997; Honk, Tuitena, de Haana, vann de Houtb, & Stamc, 2001; Smith & Waterman, 2003); b) tend to expect aggressive outcomes to ambiguous social interactions and, c) tend to interpret others' ambiguous (and even neutral) behavior as aggressive (Dill, Anderson, Anderson, & Deuser, 1997). An important strength of the SEIP model is the incorporation of multiple cognitive processes, allowing researchers to identify the most relevant biases with respect to aggressive behavior. An additional strength of this model is its applicability to both hostile (emotional) and instrumental (goal-directed) forms of overtly aggressive and relationally aggressive behavior which, although highly correlated (Polman, Orobio De Castro, Koops, Van Boxtel, & Merk, 2007; Grotpeter & Crick, 1996; Poulin & Boivin, 2000; Dodge & Coie, 1987; Raine et al., 2006), may be differentially expressed by males and females (Crick, Ostrov, & Werner, 2006; Lagerspetz, Björkqvist, & Peltonen, 1988). This feature makes the SEIP model well-suited to studying different subtypes of aggression or aggression that contains features of different subtypes (Bushman & Anderson, 2001).

Indeed, some work in children has identified specific cognitive biases associated with reactive versus proactive aggression, and overt versus relational aggression, respectively (Crick & Dodge, 1996; Dodge & Coie, 1987; Crick & Werner, 1998; Werner & Nixon, 2005).

In order to better understand SEIP biases in adults with problematic aggression, Coccaro and colleagues developed a series of assessment tools for studying SEIP in adults. One of these measures is a self-report questionnaire, the Social-Emotional Information Processing Questionnaire (SEIP-Q; Coccaro, Noblett, & McCloskey, 2009). This questionnaire presents the reader with 8 vignettes of ambiguous social interactions. For each vignette, the reader is asked to imagine a particular scenario in which he or she (as Subject A) and another person (Subject B) are participants. In each vignette, Subject B acts in a way that has negative consequences for Subject A. The intention behind Subject B's behavior is ambiguous, and the reader is asked to make an attribution about Subject B's intention. Additional questions inquire in greater depth about the attribution and about the decision-making processes supporting selecting a response to the scenario. Much of the work by Dodge and colleagues with children has involved either responses to hypothetical scenarios (e.g., Dodge & Coie, 1987) or *in vivo* modeling of ambiguous interactions. For example, a child research participant would spend time constructing a figure out of blocks, and would subsequently "overhear" another child knock the figure down (Steinberg & Dodge, 1983). The SEIP questionnaire assesses the following cognitive processes in response to hypothetical scenarios: attribution of intent and type of attribution (benign, hostile, instrumental) and negative emotional responding to the event. In addition, cognitive biases related to decision making are evaluated in response to hypothetical prosocial, overtly aggressive, and relationally aggressive responses with respect to subjects' evaluation of the response, expectancies about the outcome of a given response, and self-related likelihood of engaging in the response. Initial validation of this instrument was conducted in two samples of 923 and 461 adults from the community and focused on attributions and negative emotional responding to the vignettes. Psychometric data in the validation sample showed these subscales to have adequate to good internal consistency (α = .53–87, with the highest alphas for hostile attribution and negative emotional responding), good test-retest reliability (rs = .71-.77), and correlations that supported the convergent, construct, and discriminant validity of the scales.

The purpose of this paper was to replicate the psychometric properties of SEIP-Q related to attribution and negative emotional response, and to extend these findings by examining the psychometric properties of the SEIP-Q subscales for response evaluation and decision variables (RED) overall and in its component variables [i.e., response evaluation: (R-Value), outcome expectancy (O-Exp), response efficacy (R-Eff), and response enactment (R-Enact)]. In addition, we fully explore the correlates of SEIP-Q variables among themselves, and with external validation variables, and as a function of overt and relationally aggressive situations.

We report data supporting the validity of the full SEIP-Q based on two independent studies. The first focused on the convergent and divergent validity of the SEIP-Q in a sample of individuals from the community and the second investigated the construct validity of the SEIP-Q in healthy control adults and adults with intermittent explosive disorder (IED), a

disorder characterized by recurrent problematic aggression. We predicted that Study I would support the validity and reliability of the response evaluation and decision SEIP-Q scales and that Study II would support the utility of the SEIP-Q in clinical research subjects with and without significant recurrent, problematic, impulsive aggression.

Study I: Assessment Development, Psychometrics, and Initial Validation

Methods:

Development of the SEIP Questionnaire (SEIP-Q).: The SEIP-Q assessment consists of eight (8) written vignettes presenting socially ambiguous situations in which an adverse action by "Person B" is directed at "Person A"; participants completing the assessment are asked to identify with Person A. For example, in one scenario, Person B ("a friend") repeats some private information shared by Person A. The reader is then asked to what extent they agree with each of several attributional statements about Person B's behavior, including: (1) two hostile attributional (HA) statements ("This person wanted to make me feel stupid"); (2) an instrumental (IA) attributional statement ("This person wanted to impress other people"); and (3) a benign attributional (BA) statement ("This person forgot this was a secret"). This is followed by two questions regarding negative emotional response (NER) to the vignette situation (e.g., "How angry would you be in this situation"). See Appendix for an example of the SEIP-Q items.

In the current paper we also analyze data on response evaluation and decision (RED) processes that make up the latter stages of the current SEIP model (Fontaine, Burks, & Dodge, 2002; Fontaine & Dodge, 2006; Fontaine, Yang, Dodge, Pettit, & Bates, 2009). In order to assess these processes, the participant was asked to imagine each of three possible responses to Person B's behavior in turn. One response was a socially appropriate response (e.g., "I told you that in confidence, next time be more discrete"); one was an overtly aggressive response ("How could you do that?! I'm going to kill you!"); and one was a relationally aggressive response (e.g., "Giving the friend the 'silent treatment' for several weeks"). These response types were adapted from those developed by Fontaine et al. 2002, in their work in adolescent subjects. After each possible response option, participants were asked seven Likert-scaled questions to assess four RED variables: response evaluation (R-Value: e.g., "How good is it to act this way?"), outcome expectation (O-Exp: e.g., "If you acted this way: How likely is it you will get what you want?; How likely is it that others will respect you?, How would you feel about yourself?; How likely is it that others will like you?"), response efficacy (R-Eff; e.g., "How easy is it for you to act this way?"), and response enactment (R-Enact: e.g., "How likely is it you would act this way?"). RED variables were calculated for each of three response scenarios and were first examined as an overall RED variable for each scenario and then as the four separate components making up the overall RED variable. For ease of presentation, an overall aggressive RED variable was first examined as the average of the scores obtained from the overtly aggressive and the relationally aggressive response options before examining each separate aggressive response option.

All Likert-scaled ratings ranged from 0 (e.g., "Not At All Likely") to 3 (e.g., "Very Likely"). For ease of interpretation, individual SEIP-Q scores represent each variable as an averaged

score on the same 0–3 scale (see Appendix for details on SEIP-Q scoring). We previously reported on the psychometrics of the attributional and emotional SEIP variables (Coccaro et al., 2009) with internal consistency and test-retest reliability in the good-to-excellent range.

Participants.: Study I participants included 250 individuals randomly selected from the PennTwin Study Program, a population-based cohort of twins born in Pennsylvania between 1959 and 1978 (Coccaro & Jacobson, 2006). Data from only one member of any twin pair were used in this study. Participants included 139 females and 111 males ranging in age from 18 to 51 years (mean: 33.6 ± 7.6) with a median income of $50,000 per household and a racial profile (89.6% Caucasian, 7.2% African-American, and 3.2% other) similar to that of the Commonwealth of Pennsylvania.

Methods: Measures.

Automatic Thoughts: Hostile Automatic Thought Questionnaire (HAT) and Positive Automatic Thought Questionnaire (PAT).: For convergent/divergent validity, the HAT (Snyder, Crowson, Houston, Kurylo, & Poirier, 1997) and PAT (Burgess & Haaga, 1994) were used, respectively, for evidence of convergent and divergent validity. The HAT, a 30 item Likert scaled questionnaire, assesses automatic hostile thoughts and tendencies (e.g., physical aggression, derogation, and revenge) by asking subjects to estimate the frequency of various hostile self-statements over the previous week (e.g., “This person needs to be taught a lesson”) and has excellent internal reliability (α = .95; Snyder, 1997). Conversely, the PAT, a 22 item Likert scaled questionnaire, assesses automatic positive thoughts (e.g., “My life is running smoothly”) and has excellent internal consistency (α = .94; Burgess & Haaga, 1994). We expected that hostile attributions (HA) would correlate directly with scores on the HAT and indirectly with scores on the PAT. We also expected similar correlations between other SEIP-Q domains such as NER and the response evaluation and decision variables for aggressive, but not socially appropriate, response options.

Aggression: Life History of Aggression (LHA), Buss-Perry Aggression Questionnaire (BPAQ), and Relational Aggression Questionnaire (RAQ).—For convergent validity analyses, overt aggression was assessed in two ways: first, with the Aggression score from the LHA (Coccaro, Berman, & Kavoussi, 1997) assessment and, second, with the Aggression (physical and verbal aggression) scores from the BPAQ (Buss & Perry, 1992). LHA Aggression assesses history of actual aggressive behavior by interview while BPAQ Aggression assesses aggressive tendencies as a personality trait by questionnaire. LHA Aggression has good internal consistency (α = .87) and good test-retest reliability up to one year (r = .80; Coccaro et al, 1997). The BPAQ Aggression scales have similarly robust psychometric properties (Buss & Perry, 1992). The RAQ was used to assess relationally aggressive behavior that harms interpersonal relationships (e.g., “when I am not invited to do something with a group of people, I will exclude those people from future activities”) with responses ranging from 0 (“not at all true”) to 3 (“very true”). Internal consistency for the RAQ is excellent (α = .92) as is the test-retest correlation over a one to two month period (Murray-Close, Ostrov, Nelson, Crick, & Coccaro, 2010). We expected the SEIP-Q to show evidence of convergent validity with measures of aggression by finding significant positive correlations between the hostile attribution and negative emotional

response with assessments of aggression (LHA, BPAQ, RAQ). We also expected to observe significant positive correlations between RAQ and the response evaluation and decision variables, especially in the case of relationally aggressive responses.

Extraversion: Eysenck Personality Questionnaire (EPQ).: For discriminant validity, we used the Extraversion scale from the EPQ (Eysenck & Eysenck, 1975) a self-report inventory of general personality. The psychometric properties of the EPQ scales are well documented (Eysenck & Eysenck, 1975). We expected the SEIP-Q to show no relation to EPQ extraversion (divergent validity).

Statistical Analysis.: Analyses were performed using SPSS 22 (IBM Corporation, 2013). Correlational analyses included Pearson correlation, and multiple regression analysis, where appropriate. SEIP-Q variables were expected to correlate positively with measures reflecting aggression (LHA, BPAQ, RAQ) and hostile thoughts (HAT) and negatively with measures reflecting converse constructs such as positive thoughts (PAT; i.e., convergent validity). Conversely, SEIP-Q variables were expected to correlate less strongly, if at all, with variables reflecting unrelated constructs such as EPQ Extraversion (i.e., discriminant validity). A two-tailed alpha value of 0.05 (Bonferroni corrected for multiple comparisons as appropriate) was used to denote statistical significance.

Results

Psychometric Properties of the SEIP-Q: Attribution and Negative Emotional Response Variables.: In this new sample, alpha coefficients were good to nearly excellent for both Hostile Attribution (HA: $\alpha = .88$) and for Negative Emotional Response (NER: $\alpha = .87$) and similar to those previously reported in the original psychometric study of these variables (i.e., HA: $\alpha = .82$; NER: $\alpha = .85$; Coccaro et al., 2009). Alpha coefficients were lower for Benign Attribution (BA: $\alpha = .68$) and for Instrumental Attribution (IA: $\alpha = .63$) but similar to those reported for the previous sample (i.e., BA: $\alpha = .66$; IA: $\alpha = .57$). Test-retest data were not collected in the current sample because our previous study revealed adequate test-retest reliability for HA and NER [e.g., HA: $r = .75$, NER: $r = .71$, both $p < .001$ (Coccaro et al., 2009).

Response Evaluation and Decision Variables: Psychometric Properties.: Alpha coefficients for the overall RED variable were excellent for both the socially acceptable, and overall aggressive response, scenarios. Alpha coefficients for the individual RED variables ranged from acceptable to excellent for the socially appropriate response scenario and very good to excellent for the overall aggressive response scenarios; Table 1A. Test-retest correlations for the overall RED variable in the 64 subjects who completed the SEIP-Q twice over a seven to eleven (mean 9.2 ± 0.7) month interval were very large for both the socially appropriate and the overall aggressive response scenarios; the correlations for the individual RED variables were no less than large in magnitude; Table 1B.

Evidence of Construct Validity for SEIP-Q Attributional and Emotional Response Variables (Table 2).: Both HA and NER correlated positively with LHA and BPAQ Aggression in the small-to-moderate range ($r = .19$ and .28) and with relational aggression

and hostile automatic thoughts in the moderate range (r = .31 and .37). NER correlated inversely with PAT (r = −.26) while the correlation with HA was inverse but not statistically significant. As expected, EPQ-Extraversion did not correlate significantly with either HA or NER; see Supplemental Materials for the full correlational matrices.

Construct Validity for SEIP-Q Response Evaluation and Decision Variables (Table 3).: In general, aggressive behavior/disposition, and hostile automatic thought scores were unrelated to the overall RED score for the socially appropriate scenarios. The opposite was observed for the overall aggressive response scenarios with aggression and hostile automatic thought scores correlating directly with the overall RED score. Positive automatic thought and EPQ-Extraversion scores were inversely, but not significantly correlated with overall RED score. Similar results were also observed with the individual RED variables. See Supplemental Materials for the full correlational matrices.

Relationships Among SEIP-Q Variables.

Among Attributional and Negative Emotional Response Variables.: As in our initial study (Coccaro et al., 2009), HA score correlated directly with NER score (r = .56, p < .001), inversely with BA (r = −.45, p < .001), and not at all with IA (r = .02, p = .753), score. BA score correlated modestly with IA (r = .25, p < .001), inversely with NER (r = −.20, p = .002); IA score also correlated modestly with NER score (r = .19, p = .003).

Among Individual Response Evaluation and Decision (RED) Variables (Table 4).: The individual response evaluation and decision variables correlated significantly within the socially acceptable response scenario and within the overall aggressive response scenario. Accordingly, moderately strong correlations were observed among R-Value, O-Exp, R-Eff and R-Enact scores for the socially appropriate response scenario (range: .47 to .82) and even stronger correlations for these variables for the two aggressive response scenarios (range: .66 to .83).

Among All SEIP-Q Variables (Table 5).: For the socially acceptable response scenarios, only IA scores correlated with the overall RED score (as well as each of the individual RED variables); BA scores also correlated with the overall RED score but, specifically, with O-Exp and R-Enact scores only. NER scores did not correlate with the overall RED variable. For aggressive response scenarios, HA (r = .50, p < .001) and NER (r = .40, p < .001) scores correlated directly with the overall RED score and with each of the individual RED variable scores. In turn, BA scores correlated inversely with the overall RED score and significantly with R-Value, R-Eff, and R-Enact scores. IA scores did not correlate significantly with the overall RED score but did correlate inversely with two of the individual RED variables (i.e., R-Value and O-Exp).

SEIP-Q Variables for Overtly, and Relationally, Aggressive Vignettes (Table 6).: Analysis of SEIP-Q variables, with SEIP-Q vignette type (i.e., overtly aggressive vignettes *vs*. relationally aggressive vignettes) as within subject factor, revealed strong correlations between SEIP-Q variable scores from overt aggressive and from relational aggressive vignettes with the strongest being the correlation between HA and NER scores

across the two types of vignettes (r = .72 for both). Despite this, SEIP-Q variable scores for the different vignette types differed significantly in nearly each case. HA and NER scores were higher for relationally vs. overtly aggressive vignettes while IA and BA scores were higher for overtly *vs*. relationally aggressive vignettes. For socially appropriate response scenarios, overall RED scores were higher for overtly *vs*. relationally aggressive vignettes. While overall RED, and individual RED variable, scores were higher for relationally *vs*. overtly aggressive vignettes, the expected outcome was the case when looking at the aggressive vignettes separately. That is, overtly aggressive vignettes had higher overall, and individual, RED scores for the overtly aggressive, compared with the relationally aggressive, response scenarios. The reverse was observed for relationally aggressive vignettes.

Discussion for Study I—The attributional and negative emotional response variables studied in this report represent a replication of our earlier work in a separate group of subjects (Coccaro et al., 2009). Overall, these variables demonstrate both good-to-excellent psychometric properties as well as evidence for construct validity. Data relevant to response evaluation and decision processes (Fontaine et al., 2002; Fontaine & Dodge, 2006; Fontaine et al., 2009), are new to this work, and demonstrate good psychometric properties as well as evidence for construct validity. Most importantly, the response assessment and decision variables correlated with external validators in the ways expected. RED variables for aggressive response scenarios correlated with measures of overt aggression (LHA), dispositional aggression (BPAQ), relational aggression (RAQ), hostile cognition (HAT), inversely with positive cognition (PAT), and not at all with extraversion. In contrast, RED variables for socially acceptable response scenarios correlated with few of our external validators.

Most notable is the observation that hostile attribution and negative emotional response were more strongly associated with overall and individual RED variables from the aggressive response scenarios than from the socially appropriate response scenarios. This supports the validity of SEIP attributional and emotional variables with the later stages of the SEIP model particularly when it comes to aggressive behavior. The observation of little relationship among these variables for socially acceptable scenarios was expected and supports the specificity of these SEIP processes for aggressive behavior.

Finally, we observed significant differences in SEIP-Q scores as a function of the type of aggression depicted in the vignettes. In every case, SEIP-Q scores to both overtly aggressive and relationally aggressive vignettes were highly correlated to a moderately large, or larger degree. Even with these sizable correlations differences in the types of vignettes were observed. For example, scores for hostile attribution and negative emotional response variables were higher from relationally aggressive than overtly aggressive vignettes. These results suggest that a relationally aggressive event may be perceived as more “threatening” in nature, with a longer lasting effect, than an overtly aggressive event. In addition, the “physical pain” of an overtly aggressive event may be relatively short-lived in contrast to the “emotional pain” associated with a relationally aggressive event because the result of such aggression leads to damage of one’s personal relationships and/or reputation. The reverse was observed for instrumental and benign attributional variables suggesting that an overtly aggressive event may be perceived as due to an instrumental (or non-hostile) motivation of

the “aggressor” compared with a relationally aggressive event which is perceived as more threatening to the subject. Response evaluation and decision variable scores also displayed predictable differences across vignettes. RED scores from overtly aggressive response scenarios were significantly higher from vignettes depicting overtly aggressive than relationally aggressive, scenarios. The reverse was true, as well, providing evidence of validity for overtly aggressive and relationally aggressive vignettes.

Study II: SEIP-Q in Psychiatric and Healthy Control Participants

Methods

Participants.: Fifty participants without current or past history of any DSM-5 disorder Healthy Controls: HC) and fifty participants meeting DSM-5 Criteria for current or lifetime Intermittent Explosive Disorder (IED) completed the SEIP-Q while participating in a larger program of research on impulsive aggression. These subjects were not included in Study I and are new to this report. Subjects were recruited through advertisements in the community targeting (a) psychiatrically healthy individuals from the community and (b) individuals with problematic aggression. Subjects were excluded if they had a life history of bipolar disorder, schizophrenia (or other psychotic disorder), or mental retardation. After screening, subjects completed a comprehensive diagnostic assessment and completed the SEIP-Q in addition to the behavioral assessments.

Diagnostic Assessment.: Psychiatric and personality disorder diagnoses were made by DSM-5 criteria (American Psychiatric Association, 2013). Diagnoses were made using information from: (a) the Structured Clinical Interview for DSM Diagnoses (SCID-I; First, Spitzer, Williams, & Gibbon, 1995) and the Structured Interview for the Diagnosis of DSM Personality Disorder (SIDP; Pfohl, Blum, & Zimmerman, 1997); (b) clinical interview by a research psychiatrist; and, (c) review of all other available clinical data. Research diagnostic interviews were conducted by individuals with a masters or doctorate degree in Clinical Psychology after a rigorous training program until raters were deemed reliable with the trainer. This process resulted in good to excellent inter-rater reliabilities (mean kappa of .84 ± .05; range: .79 to .93) across anxiety, mood, substance use, impulse control, and personality disorders. Final diagnoses (Table 5) were assigned by team best-estimate consensus procedures involving research psychiatrists and clinical psychologists as previously described (Coccaro, Nayyer, & McCloskey, 2012). Most of the IED participants (82%) had a history of psychiatric treatment (52%) or of behavioral issues for which they should have received psychiatric evaluation and/or treatment (30%).

Statistical Analysis.: Analyses were performed using SPSS 22 (IBM Corporation, 2013). Correlational analyses included Pearson correlation. Group differences were analyzed by t-test, paired t-test, and MANCOVA (age, sex, race, socioeconomic scores as covariates), where appropriate. A two-tailed alpha value of 0.05 (Bonferroni corrected for multiple comparisons as appropriate) was used to denote statistical significance.

Results

Sample Characteristics.: The diagnostic characteristics of the IED participants are displayed on Table 7 while demographic and behavioral assessment scores of the Study II sample are displayed in Table 8.

Psychometric Properties and Inter-Correlations of SEIP-Q Variables in Healthy Control and IED Participants.: Alpha coefficients for all SEIP-Q variables in this sample were nearly excellent and similar to those in Study I (HA: α = .88; NER: α = .89. Alpha coefficients for the overall RED variables were excellent for each response scenario (i.e., socially appropriate response: α = .93; all aggressive response: α = .97, and overtly aggressive: α = .96, and relationally aggressive: α = .95, response scenarios). For attributional variables, HA was inversely correlated with BA ($r = -.29$, $p = .004$), positively correlated with NER ($r = .68$, $p < .001$), and uncorrelated with IA ($r = .16$, $p = .113$), scores. IA scores were correlated with BA ($r = .20$, $p < .05$) and NER ($r = .43$, $p < .001$) scores. For response evaluation and decision variables, the overall RED score for the socially appropriate response scenarios correlated inversely with HA ($r = -.42$, $p < .001$) and NER ($r = -.37$, $p < .001$) and positively with BA scores ($r = .28$), $p = .005$) as expected. The reverse was observed for the overall aggressive response scenarios (HA: $r = .52$, $p < .001$; NER: $r = .56$, $p < .001$; BA: $r = 0.36$, $p < .001$). IA scores did not significantly correlate with any of the response scenarios.

Group Differences in SEIP-Q Variables (Table 9).: Separate MANCOVAs with group (Healthy Control *vs.* IED) as the independent variable with HA, NER, overall RED (as well as R-Value, O-Exp, R-Eff, and R-Enact in subsequent analyses), scores for each response scenario (socially appropriate, all aggressive, overtly aggressive, and relationally aggressive) as dependent variables, showed significantly higher HA, higher NER, and lower BA, scores for IED than for HC participants; IA scores did not differ between the groups. For socially appropriate response scenarios, IED subjects evaluated the socially appropriate response less positively than HC participants based on a lower overall RED score for this scenario. Examining the individual RED variables, IED participants viewed the socially appropriate response scenarios less positively (R-Value, O-Exp), less easy to do (R-Eff), and less likely to carry out (R-Enact). This evaluation was in direct contrast to both aggressive response scenarios where IED subjects evaluated aggressive response scenarios much more positively across all RED variables, regardless of whether the response scenario was overtly or relationally aggressive in nature.

Discussion—Study II replicates the basic psychometric properties of the SEIP-Q in Study I but does so in healthy control and impulsive aggressive adults evaluated in a clinical research setting. Of the steps that can be assessed by the SEIP-Q, impulsive aggressive individuals with IED, compared with healthy controls, manifested elevated HA and NER scores and were much more likely to value overtly (or relationally) aggressive responses (R-Value). In addition, individuals with IED appear to believe that such responses will achieve their instrumental and social/emotional goals in the social encounter (O-Exp), believe that they can to carry out such responses (R-Eff), and that they would actually enact such responses (R-Enact) when social threats are either overtly or relationally aggressive in

nature. These results are consistent with what has been reported in children and adolescents (Crick & Werner, 1998; Fontaine et al., 2002; Fontaine & Dodge, 2006; Fontaine et al., 2009) and document that abnormalities in social-emotional information processing extends to adults as well, making work in this area especially relevant. Further, the results of the clinical research sample, unlike the study of a general population sample in Study I, note more robust relationships among the SEIP-Q variables particularly when it comes to correlates for the socially acceptable response option. For example, expected relationships between the response evaluation and decision variables (e.g., inverse correlations with HA and NER) were observed only in the clinical research sample and not in the general population sample. This is likely to be due to restriction of the range in Study I compared with Study II participants (who included highly aggressive as well as non-aggressive individuals).

Overall, these two studies suggest that hostile attribution, negative emotional response and the overall response evaluation and decision (RED) variable are the most valuable of the SEIP-Q variables. Each of these demonstrate excellent (or near excellent) internal consistency, test-retest, and subject-control differences. In contrast, instrumental, and benign, attribution variables have lower internal consistency, weaker test-retest reliability, and little (BA) to no (IA) subject-control differences.

LIMITATIONS

This study has limitations that should be addressed in future studies. First, participants studied in Study I were racially homogeneous and restricted in age range, limiting the generalizability of the SEIP-Q across different cultural and demographic subgroups. Thus, it would be important for future studies a more diverse participant group. Second, the SEIP-Q assesses all but the first stage (“encoding”) of the full SEIP model. That said, an “encoding” variable cannot be assessed by questionnaire. Third, the data presented in this paper cannot inform the temporal sequence of cognitive, emotional, and behavioral components of aggression. The preliminary correlational data presented in this manuscript is meant to direct future research in terms of providing a link between social and emotional information processes. Fourth, while the IED participants were recruited from the community and not from treatment centers, we note that most (82%) of the IED participants had a history of psychiatric treatment or of behavioral issues for which they should have received psychiatric evaluation and/or treatment. Thus, these participants may not be very different than those seen at treatment centers.

In conclusion, the SEIP-Q offers a valid and reliable method of assessing all but one of the stages of the SEIP model in adults and, appears to be a valid measure in psychiatric and control groups as well. The self-report format is easy to administer and score. In addition, the SEIP-Q is balanced so that social cognition responses to both overtly aggressive and relationally aggressive stimuli can be assessed as well as response evaluation and decision making variables associated with overtly aggressive and relationally aggressive responses can be assessed. Accordingly, we posit that the SEIP-Q will allow investigators to assess social emotional cognition in adult populations within the context of personality, mood, and other disorders of emotional dysregulation.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1A

Alpha (α) Coefficients for SEIP-Q Response Evaluation and Decision (RED) Variables

Response Type	All RED Variables	Response Valuation	Outcome Expectation	Response Efficacy	Response Enactment
Appropriate Response	.93	.75	.90	.74	.64
All Aggressive Responses	.96	.86	.92	.89	.86
Overtly Aggressive Response	.94	.77	.88	.83	.78
Relationally Aggressive Response	.94	.76	.90	.80	.78

Note: Mean α based on appropriate, overtly aggressive, and relationally aggressive response options only.

Table 1B

Test-Retest Pearson (r) Coefficients for SEIP-Q Response Evaluation and Decision (RED) Variables

Response Type	All RED Variables	Response Valuation	Outcome Expectation	Response Efficacy	Response Enactment
Socially Appropriate	.72	.56	.67	.54	.64
All Aggressive	.71	.66	.76	.71	.77
Overtly Aggressive	.69	.71	.75	.74	.74
Relationally Aggressive	.62	.52	.70	.58	.70

Note: p values for all r coefficients < .001; mean r based on appropriate, overtly aggressive, and relationally aggressive response options only.

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Table 2

Correlations: HA and NER Variables with External Validators

External Validator	Hostile Attribution r (partial r)	Negative Emotional Response r (partial r)
LHA Aggression	.19 (.19)	.21* (.23*)
BPAQ Aggression	.28* (.25*)	.19* (.25*)
Relational Aggression	.32* (.33*)	.35* (.34*)
Hostile Automatic Thoughts	.37* (.36*)	.31* (.37*)
Positive Automatic Thoughts	−.15 (−.13)	−.26* (−.24*)
EPQ Extraversion	.00 (.00)	−.09 (−.10)

* Notes. $p < .05$ after adjusting for 12 separate correlations.

Covariates for partial r coefficients included age, sex, race, and socioeconomic score.

Table 3

Response Evaluation and Decision (RED) Variables: Correlations with External Validators

Response Type	All RED Variables r (partial r)	Response Valuation r (partial r)	Outcome Expectation r (partial r)	Response Efficacy r (partial r)	Response Enactment r (partial r)
Socially Acceptable Response					
LHA Aggression	−.05 (−.09)	−.02 (−.06)	−.01 (−.04)	−.12 (−.15)	−.12 (−.14)
BPAQ Aggression	−.02 (.01)	−.09 (−.06)	−.04 (.00)	.00 (.00)	.02 (.05)
Relational Aggression	−.05 (−.07)	−.06 (−.07)	.00 (−.01)	−.22*(−.23*)	−.04 (−.04)
Hostile Automatic Thoughts	−.05 (−.05)	−.06 (−.05)	−.02 (−.02)	−.19 (−.21)	−.01 (.00)
Positive Automatic Thoughts	.20 (.25)	.15 (.17)	.18 (.23)	.20 (.19)	.25*(.29*)
EPQ Extraversion	.12 (.10)	.09 (.04)	.05 (.04)	.23*(.20)	.25*(.23*)
All Aggressive Responses					
LHA Aggression	.26*(.23*)	.18 (.17)	.22*(.19)	.25*(.22)	.34*(.31*)
BPAQ Aggression	.40*(.36*)	.34*(.30*)	.33*(.28*)	.40*(.37*)	.37*(.39*)
Relational Aggression	.36*(.35*)	.34*(.31*)	.35*(.34*)	.32*(.35*)	.43*(.42*)
Hostile Automatic Thoughts	.40*(.39*)	.34*(.33*)	.41*(.38*)	.41*(.40*)	.42*(.42*)
Positive Automatic Thoughts	−.16 (−.17)	−.13 (−.13)	−.11 (−.12)	−.13 (−.16)	−.14 (−.14)
EPQ Extraversion	−.05 (−.08)	−.09 (−.15)	−.05 (−.09)	−.02 (−.05)	−.07 (−.08)
Overtly Aggressive Response					
LHA Aggression	.24*(.18)	.14 (.12)	.18 (.13)	.21*(.15)	.31*(.24*)
BPAQ Aggression	.46*(.42*)	.40*(.35*)	.38*(.31*)	.45*(.40*)	.45*(.44*)
Relational Aggression	.28*(.29*)	.28*(.26*)	.31*(.31*)	.23*(.26*)	.34*(.35*)
Hostile Automatic Thoughts	.41*(.38*)	.34*(.30*)	.40*(.35*)	.39*(.36*)	.44*(.41*)
Positive Automatic Thoughts	−.15 (−.16)	−.14 (−.15)	−.08 (−.08)	−.12 (−.15)	−.11 (−.12)
EPQ Extraversion	−.03 (−.06)	−.08 (−.15)	−.01 (−.04)	.02 (.00)	−.04 (−.05)
Relationally Aggressive Response					
LHA Aggression	.27*(.27*)	.19 (.20)	.19 (.18)	.25*(.25*)	.31*(.32*)

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Response Type	All RED Variables r (partial r)	Response Valuation r (partial r)	Outcome Expectation r (partial r)	Response Efficacy r (partial r)	Response Enactment r (partial r)
BPAQ Aggression	.30* (.28*)	.22* (.20)	.25* (.20)	.28* (.28*)	.24* (.29*)
Relational Aggression	.44* (.42*)	.34* (.31*)	.43* (.43*)	.31* (.30*)	.44* (.43*)
Hostile Automatic Thoughts	.38* (.40*)	.28* (.29*)	.39* (.36*)	.31* (.32*)	.33* (.37*)
Positive Automatic Thoughts	−.13 (−.13)	−.09 (−.07)	−.05 (−.05)	−.12 (−.15)	−.15 (−.14)
EPQ Extraversion	−.07 (−.09)	−.08 (−.12)	−.04 (−.05)	−.06 (−.09)	−.09 (−.09)

*Note: p < .05 after adjusting for 48 separate correlations.

Covariates for partial r coefficients included age, sex, race, and socioeconomic score.

Table 4

Correlations Among Response Evaluation and Decision (RED) Variables fpr Socially Appropriate and Aggressive Response Options.

	SA: O-Exp	SA: R-Eff	SA: R-Enact	AGG: R-Value	AGG: O-Exp	AGG: R-Eff	AGG: R-Enact
SA: R-Value	.82*	.51*	.61*	−.16	−.15	−.12	−.03
SA: O-Exp		.47*	.52*	−.15	−.08	−.11	−.05
SA: R-Eff			.71*	.12	.10	.08	.19
SA: R-Enact				−.03	−.02	−.10	−.04
AGG: R-Value					.83*	.66*	.71*
AGG: O-Exp						.69*	.71*
AGG: R-Eff							.78*

*Note: $p < .05$ after adjusting for 28 separate correlations. SA: Socially Appropriate Response Option; AGG: Aggressive Response Option; R-Value: Response Valuation; O-Exp: Outcome Expectation; R-Eff: Response Efficacy; R-Enact: Response Enactment.

Table 5

Correlations Between Attributional and Emotional Response Variables With Response Evaluation and Decision (RED) Variables

Response Type	All RED Variables r (partial r)	Response Valuation r (partial r)	Outcome Expectancy r (partial r)	Response Efficacy r (partial r)	Response Enactment r (partial r)
Socially Acceptable Responses:					
Hostile Attribution	−.21 (−.21)	−.18 (−.15)	−.23 * (−.23 *)	−.16 (−.15)	−.07 (−.05)
Instrumental Attribution	.41 * (.41 *)	.40 * (.40 *)	.38 * (.37 *)	.24 * (.24 *)	.32 * (.31 *)
Benign Attribution	.30 * (.30 *)	.21 (.21)	.30 * (.31)	.17 (.17)	.22 * (.20)
Negative Emotional Response	−.02 (−.02)	.07 (.08)	−.02 (−.02)	−.21 * (−.20)	.03 (.02)
All Aggressive Responses					
Hostile Attribution	.50 * (.48 *)	.39 * (.34 *)	.40 * (.36 *)	.40 * (.39 *)	.50 * (.50 *)
Instrumental Attribution	−.09 (−.18)	−.29 * (−.27 *)	−.23 * (−.20)	−.15 (−.13)	−.12 (−.10)
Benign Attribution	−.31 * (−.27 *)	−.25 * (−.21)	−.18 (−.14)	−.31 * (−.26*)	−.30 * (−.27)
Negative Emotional Response	.40* (.45 *)	.28 * (.31 *)	.25 * (.30 *)	.33 * (.39 *)	.48 * (.52 *)
Overtly Aggressive Responses:					
Hostile Attribution	.43 * (.40 *)	.35 * (.29 *)	.41 * (.36 *)	.34 * (.31 *)	.45 * (.43 *)
Instrumental Attribution	−.24 * (−.21)	−.29 * (−.26 *)	−.24 * (−.20)	−.22 (−.19)	−.17 (−.13)
Benign Attribution	−.30 * (−.23 *)	−.21 * (−.16)	−.23 * (−.17)	−.29 * (−.21 *)	−.28 * (−.22)
Negative Emotional Response	.30 * (.37 *)	.23 * (.27 *)	.23 * (.29 *)	.22 * (.30 *)	.38 * (.44 *)
Relationally Aggressive Response					
Hostile Attribution	.48 * (.47 *)	.35 * (.31 *)	.37 * (.32 *)	.40 * (.41 *)	.46 * (.49 *)
Instrumental Attribution	−.15 (−.14)	−.24 * (−.23 *)	−.24 * (−.20)	−.06 (−.05)	−.05 (−.06)
Benign Attribution	−.29 * (−.27 *)	−.22 * (−.20)	−.23 * (−.19)	−.28 * (−.27 *)	−.26 * (−.27 *)
Negative Emotional Response	.44 * (.46 *)	.29 * (.30 *)	.24 * (.28 *)	.38 * (.42 *)	.49 * (.50 *)

* Note: $p < .05$ after adjusting for 32 separate correlations; covariates for partial r coefficients included age, sex, race, and socioeconomic score.

Table 6

Mean (± SD) SEIP-Q Variables as a Function of SEIP-Q Vignette Type

	Overtly Aggressive Vignettes	Relationally Aggressive Vignettes	Differences Between Vignettes	p	r
Attribution / Emotional Variables					
Hostile Attribution	0.52 (± 0.39)	0.85 (± 0.47) *	RA > OA	< .001	.72 *
Instrumental Attribution	2.21 (± 0.44)	2.01 (± 0.42) *	OA > RA	< .001	.42 *
Benign Attribution	2.15 (± 0.50)	1.59 (± 0.53) *	OA > RA	< .001	.45 *
Negative Emotional Response	1.22 (± 0.48)	1.54 (± 0.51) *	RA > OA	< .001	.72 *
Socially Appropriate Responses					
All RED Variables	1.99 (± 0.38)	1.91 (± 0.38)	OA > RA	= .001	.59 *
Response Valuation	2.17 (± 0.43)	2.16 (± 0.38)	OA = RA	= .595	.60 *
Outcome Expectation	1.84 (± 0.34)	1.96 (± 0.39)	RA > OA	< .001	.68 *
Response Efficacy	1.96 (± 0.56)	1.76 (± 0.55)	OA > RA	< .001	.56 *
Response Enactment	2.00 (± 0.48)	1.75 (± 0.52)	OA > RA	< .001	.46 *
All Aggressive Responses					
All RED Variables	0.59 (± 0.33)	0.66 (± 0.36)	RA > OA	< .001	.71 *
Response Valuation	0.54 (± 0.34)	0.64 (± 0.34)	RA > OA	< .001	.68 *
Outcome Expectation	0.61 (± 0.30)	0.63 (± 0.29)	RA = OA	= .125	.72 *
Response Efficacy	0.63 (± 0.49)	0.72 (± 0.52)	RA > OA	< .001	.71 *
Response Enactment	0.63 (± 0.43)	0.69 (± 0.48)	RA > OA	= .018	.64 *
Overtly Aggressive Responses					
All RED Variables	0.59 (± 0.38)	0.50 (± 0.36)	OA > RA	< .001	.71 *
Response Valuation	0.53 (± 0.37)	0.49 (± 0.37)	OA = RA	= .043	.64 *
Outcome Expectation	0.63 (± 0.32)	0.54 (± 0.30)	OA > RA	< .001	.68 *
Response Efficacy	0.61 (± 0.56)	0.54 (± 0.52)	OA > RA	= .010	.68 *

	Overtly Aggressive Vignettes	Relationally Aggressive Vignettes	Differences Between Vignettes	p	r
Response Enactment	0.60 (± 0.49)	0.44 (± 0.44)	OA > RA	< .001	.61*
Relational Aggressive Responses					
All RED Variables	0.62 (± 0.35)	0.84 (± 0.44)	RA > OA	< .001	.54*
Response Valuation	0.55 (± 0.37)	0.78 (± 0.41)	RA > OA	< .001	.53*
Outcome Expectation	0.60 (± 0.32)	0.73 (± 0.33)	RA > OA	< .001	.59*
Response Efficacy	0.65 (± 0.52)	0.90 (± 0.64)	RA > OA	< .001	.54*
Response Enactment	0.66 (± 0.48)	0.94 (± 0.63)	RA > OA	< .001	.48*

*
Note: p < .05 by paired t-test after adjusting for 32 separate correlations.

Table 7

Syndromal and Personality Disorder Diagnoses in the Patient Sample

	IED (N = 50)
Current Syndromal Disorders:	
Any Depressive *or* Anxiety Disorder	17 (34%)
Any Depressive Disorder	11 (22%)
Any Anxiety Disorder	10 (20%)
Any Substance Use Disorder	0 (0%)
Any Stress and Trauma Disorder	4 (8%)
Any Eating Disorder	3 (6%)
Any Obsessive-Compulsive Disorder	1 (2%)
Any Somatoform Disorder	1 (2%)
Intermittent Explosive Disorder	32 (64%)
Non-IED Impulse Control Disorder	0 (0%)
Lifetime Syndromal Disorders:	
Any Depressive *or* Anxiety Disorder	33 (66%)
Any Depressive Disorder	30 (60%)
Any Anxiety Disorder	12 (24%)
Any Substance Use Disorder	26 (52%)
Any Stress and Trauma Disorder	10 (20%)
Any Eating Disorder	7 (14%)
Any Obsessive-Compulsive Disorder	3 (6%)
Any Somatoform Disorder	1 (2%)
Intermittent Explosive Disorder	50 (100%)
Non-IED Impulse Control Disorder	0 (0%)
Personality Disorders:	
Any Personality Disorder	34 (68%)
Personality Disorder Clusters:	
Cluster A (Odd)	5 (10%)
Cluster B (Dramatic)	17 (34%)
Cluster C (Anxious)	6 (12%)
PD-NOS	12 (24%)

Table 8

Demographic and Behavioral Characteristics of the Study II Sample

	HC (N = 50)	IED (N = 50)	Group Differences	p
Demographic Variables				
Age	38.6 ± 16.1	41.2 ± 11.7	HC = IED	.360[a]
Gender (% Female)	62%	60%	HC = IED	.990[b]
Race (% W / AA / Other)	62 / 20 / 18	48 / 34 / 18	HC = IED	.258[b]
SES Score	50.7 ± 9.8	39.8 ± 14.0	HC > IED	< .001[a]
Psychometric Variables				
LHA Overt Aggression	3.6 ± 3.3	16.0 ± 4.4	IED > HC	< .001[a]
BPAQ Overt Aggression	25.1 ± 6.9	40.9 ± 11.9	IED > HC	< .001[a]
RAQ Relational Aggression	4.4 ± 3.6	15.5 ± 11.4	IED > HC	< .001[a]
HAT Hostile Automatic Thoughts	35.1 ± 4.3	60.3 ± 22.8	IED > HC	< .001[a]
PAT Positive Automatic Thoughts	65.2 ± 13.9	51.3 ± 20.0	IED > HC	= .001[a]
EPQ Extraversion	15.8 ± 3.6	13.0 ± 5.6	IED > HC	= .017[a]

"a" Notes: by t-test (adding demographic covariates did not change these results).

"b" by Chi-Square test.

TABLE 9

Marginal Means for SEIP-Q Variable Scores in HC and IED Subjects

SEIP Variable	HC (N = 50) Mean ± SD	IED (N = 50) Mean ± SD	p*
Hostile Attribution (HA)	0.67 ± 0.47	0.92 ± 0.47	= .010
Instrumental Attribution (IA)	2.17 ± 0.47	2.08 ± 0.47	= .356
Benign Attribution (BA)	1.86 ± 0.50	1.57 ± 0.50	= .008
Negative Emotional Response (NER)	1.33 ± 0.56	1.72 ± 0.56	= .001
Overall Mean for RED Variables			
Socially Appropriate Response	2.09 ± 0.36	1.83 ± 0.36	= .001
All Aggressive Responses	0.56 ± 0.41	1.01 ± 0.41	< .001
Overtly Aggressive Response	0.46 ± 0.43	0.91 ± 0.43	< .001
Relationally Aggressive Response	0.66 ± 0.45	1.11 ± 0.45	< .001
Response Valuation (R-Value) for:			
Socially Appropriate Response	2.27 ± 0.40	2.05 ± 0.40	= .009
All Aggressive Responses	0.59 ± 0.41	0.79 ± 0.41	= .001
Overtly Aggressive Response	0.40 ± 0.46	0.74 ± 0.46	= .001
Relationally Aggressive Response	0.64 ± 0.43	0.91 ± 0.43	= .003
Outcome Expectancy (O-Exp) for:			
Socially Appropriate Response	1.94 ± 0.35	1.73 ± 0.35	= .006
All Aggressive Responses	0.60 ± 0.32	0.79 ± 0.32	= .006
Overtly Aggressive Response	0.56 ± 0.34	0.75 ± 0.34	= .009
Relationally Aggressive Response	0.65 ± 0.34	0.83 ± 0.34	= .011
Response Efficacy (R-Eff) for:			
Socially Appropriate Response	2.01 ± 0.54	1.74 ± 0.54	= .002
All Aggressive Responses	0.59 ± 0.59	1.27 ± 0.59	< .001
Overtly Aggressive Response	0.50 ± 0.63	1.14 ± 0.63	< .001
Relationally Aggressive Response	0.68 ± 0.65	1.40 ± 0.65	< .001
Response Enactment (R-Enact) for:			
Socially Appropriate Response	2.06 ± 0.45	1.80 ± 0.45	= .007
All Aggressive Responses	0.53 ± 0.54	1.15 ± 0.54	< .001
Overtly Aggressive Response	0.39 ± 0.56	1.00 ± 0.56	< .001
Relationally Aggressive Response	0.68 ± 0.62	1.30 ± 0.62	< .001

*After significant MANCOVA (age, sex, race, socioeconomic score as covariates).