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EVIDENCE OF SELF-SCHEMATIC COGNITIVE PROCESSING IN WOMEN WITH DIFFERING SEXUAL SELF-VIEWS

JILL M. CYRANOWSKI and

Western Psychiatric Institute and Clinic

BARBARA L. ANDERSEN

The Ohio State University

Sexual self-schemas have been defined as cognitive representations about sexual aspects of the self (Andersen & Cyranowski, 1994). Women's sexual self-views include both positive and negative dimensions, and are associated with systematic patterns of sexual-romantic affects and behaviors (Cyranowski & Andersen, 1998a). The current research explores cognitive components of the sexual self-schema construct. Specifically, we examine how women with Positive, Co-Schematic, Aschematic, and Negative sexual self-views cognitively process sexual-romantic information about the self. Results indicate that these groups exhibit consistent difference in their retrieval of sexual-romantic personal experience, prediction of future sexual-romantic responses, and the manner and speed with which they make sexually-relevant self-judgments.

Research suggests that the self-concept is multifaceted, comprised of self-views within multiple domains of social knowledge (e.g., Greenwald & Pratkanis, 1984; Kihlstrom & Cantor, 1984; Markus & Wurf, 1987). These self-views, or self-schemas, function to filter, organize, and interpret self-relevant information. Sexual self-schemas have been defined as cognitive representations regarding sexual aspects of the self. Research indicates that women with differing sexual self-views display consistent differences in their sexual attitudes, and sexual responsiveness. In the current research, we test whether women with alternate sexual self-views also display predictable differences in how they cognitively process sexually relevant information about the self (Andersen & Cyranowski, 1994; Markus, 1977).

THE SEXUAL SELF-SCHEMA CONSTRUCT

Prior to the work of Andersen and Cyranowski (1994), little research had studied sexuality as a social-cognitive phenomenon (see Simon & Gagnon, 1987; Whalen & Roth, 1987 for exceptions), nor attempted to map women's (and men's) cognitive views of the sexual self (Andersen & Cyranowski, 1995). Sexual self-schemas have been defined as cognitive representations regarding sexual aspects of the self, that are derived from past experience, manifest in current sexual cognition, and that influence sexual affect and behavior. Research indicates that women's sexual self-views are multifaceted, and may include both positive aspects (such as romantic/passionate and open/direct self-views) and negative aspects (such as embarrassment or conservatism). Further, research supports a bivariate model of women's sexual self-schema—in which positive (romantic/open) and negative (embarrassed/conservative) self-views are assessed as independent dimensions (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998a). Using subject scores on the Sexual Self-Schema

Scale, an unobtrusive trait-adjective rating scale, the bivariate model delineates four possible sexual self-schema groups: Positive schematic (those with strong positive and weak negative sexual self-views); Co-Schematic (those with simultaneously strong positive and negative sexual self-views); Aschematic (those with neither positive nor negative sexual self-views); and Negative schematic (those with weak positive and strong negative sexual self-views).

Research indicates distinctive patterns of sexual and romantic responding across these four schema groups (Cyranowski & Andersen, 1998a). Positive scorers report positive attitudes regarding sexual expression, high frequencies of sexual behaviors, high levels of positive sexual affects (such as sexual desire and arousal), and low levels of negative sexual affects (Such as sexual anxiety). Conversely, Negative scorers report negative attitudes toward sex, low levels of sexual desire and arousal, high levels of sexual anxiety, and a tendency to avoid sexual interactions. Women's sexual self-views are also associated with the development of emotional attachments within romantic relationships. For example, as compared to their Negative counterparts, Positive scorers report greater feelings of passionate love and more extensive romantic relationship histories; in contrast, Negative scorers report anxieties about abandonment and an avoidance of intimacy within romantic relationships (Cyranowski & Andersen, 1998a).

Co-Schematics are those who endorse both positive (romantic/open) and negative (embarrassed/conservative) sexual self-views. These conflicting self-views appear to be disruptive, as manifest in a pattern of approach-avoidance responses to sexual-romantic cues. For example, Co-Schematics report strong feelings of passionate love, a preoccupation with sexual thoughts, and high levels of sexual desire and arousal—accompanied by fears of romantic abandonment and sexual anxiety. As a result of these conflicting responses, Co-Schematics display a moderately restricted pattern of sexual activity, falling between behavioral levels reported by the Positive and Negative schema groups. Notably, this middling level of sexual activity appears deceptively similar to that of the Aschematic group. Aschematic individuals endorse neither strong positive nor strong negative views on the Sexual Self-Schema Scale; hence, these individuals may lack an articulated schematic framework regarding the sexual self (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998a). Supporting this conceptual framework, Aschematics report few thoughts about sex, low levels of passionate love, and low levels of both positive and negative sexual affects (such as sexual desire, arousal, and anxiety).

Thus, previous research has documented consistent differences in the sexual behaviors, sexual attitudes, and sexual response patterns of these four schema groups. The sexual self-schema construct has also displayed predictive validity and clinical utility. Sexual self-schema scores have been shown to predict sexual behaviors in college-aged women (Andersen & Cyranowski, 1994), and are associated with sexual response outcomes in breast and gynecologic cancer survivors (Andersen, Woods & Copeland, 1997; Yurek, Farrar, & Andersen, 2000). There is, however, little information about how women with alternate sexual self-views cognitively process sexually relevant social information. Such research would advance our basic understanding of the functional aspects of women's sexual self-schemas. In addition, clarification of relevant cognitive processes may enhance clinical interventions for female sexual difficulty or dysfunction (for discussion, see Cyranowski, Aarestad, & Andersen, 1999). Hence, the present study was designed to explore the cognitive processing aspects of this novel sexuality construct. Specifically, we employed classic tests of schematic processing to examine differences with which women with alternate sexual self-views cognitively process sexually relevant information about the self.

RESEARCH PARADIGMS FOR SELF-SCHEMATIC PROCESSING

Markus (1977) first defined self-schemas (or self-schemata) as “cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information contained in the individual’s social experience” (p.64). Drawing from this definition, individuals with a well-elaborated self-view should have a significant memory store of behavioral evidence related to this view. These self-views, in turn, should function as efficient guides for ongoing judgments, decisions, and predictions regarding the self in the relevant domain. Specifically, individuals with a well-elaborated self-schema within a particular domain should: (1) Retrieve domain-relevant behavioral evidence (i.e., past personal experience related to one’s self-view) with relative ease; (2) Predict future domain-relevant behaviors in a manner consistent with one’s self-view; (3) Display consistency in domain-relevant self-judgments; and, (4) Process domain-relevant information about the self with relative ease (see Markus & Zajonc, 1985; Markus & Sents, 1982; Markus & Smith, 1981).

The current study was developed to test for self-schematic processing in women with differing sexual self-views. Specifically, we examine whether women with Positive, Co-Schematic, Aschematic, and Negative sexual self-views display differences in their: (1) retrieval of sexual-romantic personal experience, (2) prediction of future sexual-romantic responses, and, (3) the consistency and speed with which they make sexual-romantic self-judgments. In Study I, we test for schema group differences in cognitive processing across self-schematic processing tasks (1) and (2), above. In Study II, we examine hypothesis (3), in an extension of a reaction time paradigm that was also designed to explore the interaction of person and situation sources of self-schematic accessibility within a timed self-judgment task.

STUDY I: RETRIEVING BEHAVIORAL EVIDENCE AND PREDICTING FUTURE RESPONSES: SCHEMA GROUP DIFFERENCES

METHOD

Participants—Subjects were 154 female undergraduates at The Ohio State University enrolled in Introductory Psychology, who received course credit for experiment participation. The mean age of subjects was 20.3 years ($SD = 2.94$ years), with a mean education level of 13.19 years (between the first and second year of college). Subjects were predominantly Caucasian (79.3%; 13.8% were African American, 1.7% Asian, 1.7% Hispanic, 3.4% other) and unmarried (98.3%). Of the subjects, 95% reported a predominantly or exclusively heterosexual orientation.

Procedures—Subjects completed the Sexual Self-Schema Scale (Andersen & Cyranowski, 1994) as part of voluntary screening, in which students complete questionnaires for multiple experiments during the first week of a Psychology 100 course. Approximately 6 to 8 weeks after prescreen participation, subjects were recruited for study participation. They completed questionnaire booklets with demographic items and Tasks 1 and 2 (described below) in groups of 10 to 25.

MEASURES

The Sexual Self-Schema Scale—The Sexual Self-Schema Scale is an unobtrusive measure of sexual self-view that was developed using a classic empirical approach to test construction (see Andersen & Cyranowski, 1994, for the women’s scale; Andersen, Cyranowski, & Espindle, 1999, for the men’s scale). First, trait-adjectives most associated with a semantic representation of a “sexual woman” (as reported by females) were identified

from a pool of 300 adjectives. Next, a “criterion keying” approach to item selection was utilized throughout a series of convergent and discriminant validity studies. After screening items to ensure that they were not overly influenced by generational differences, positivity / negativity, self-esteem, or social desirability, we “keyed” or selected only those items for which self-ratings were empirically related to relevant criterion variables—such as sexual attitudes, sexual behavior indices, sexual arousal, or passionate love.

This procedure resulted in a self-report measure that is sexually relevant yet unobtrusive in nature. Specifically, subjects rate 50 trait-adjectives (26 scored and 24 fillers) on a Likert scale ranging from 0 (Not at all descriptive of me) to 6 (Very much descriptive of me). Internal consistency (Cronbach alpha = .82) and test-retest reliability (2-week, $r = .91$) estimates for the scale are high (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998b). Factor analyses indicate that women’s sexual self-views are comprised of three factors. Two of these factors represent positive views of the sexual self, labeled as romantic/passionate (Factor 1; includes 10 items such as romantic, passionate, loving, Stimulating) and open/direct (Factor 2; includes 9 items such as direct, straight-forward, open-minded). Factor 3, labeled embarrassed / conservative, represents a negative or inhibiting sexual self-view and includes ⁷ items such as embarrassed, conservative, self-conscious, and timid.

This assessment approach differs appreciably from more face-valid approaches to self-schema assessment. For example, we did not ask women to describe directly their sexual selves and to rate importance of these sexual self-views. This is because prior research has revealed the problematic nature of such face-valid self-reports when measuring the private and affectively loaded area of sexuality (see Catania, Gibson, Chitwood, & Coates, 1990; Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). In contrast, the criterion keying approach to scale development resulted in a powerful set of self-ratings that, being nonobvious, are not hindered by common response set biases, yet that are strongly correlated with sexually relevant criteria.

Extensive validity studies indicate that women with alternate sexual self-views display predictable differences across reported levels of sexual behaviors, sexual attitudes, and sexual responsiveness (Cyranowski & Andersen, 1998a); that sexual self-schema scores are associated with sexual response outcomes in samples of breast and gynecologic cancer survivors (Andersen et al., 1997; Yurek et al., 2000); and that sexual self-schema scores can predict group differences in sexual behaviors over an 8-week time interval (Andersen & Cyranowski, 1994). Finally, research indicates that the Sexual Self-Schema Scale shows discriminant validity in relation to measures of mood, social desirability, self-esteem, and personality. For example, scores show nonsignificant, low magnitude correlations with the Marlowe-Crowne and negative/positive affect, as well as incremental validity in the prediction of sexual outcomes over and above such personality constructs as extroversion or self-esteem (Andersen & Cyranowski, 1994).

Task 1: Retrieving Schema-Relevant Behavioral Evidence—Subjects received a booklet containing 16 words, one listed at the top of each page. Seven items were chosen to tap Factors 1 and 2 (romantic/open traits); five items were chosen to tap Factor 3 (embarrassed/conservative traits); and three items were chosen as fillers. The 12 stimulus items were selected because they were found to be related to sexual outcomes in previous research, and consisted of eight adjectives from the Sexual Self-Schema Scale (e.g.,

⁷Interestingly, exploratory analysis of romantic/open endorsement latencies indicated a completely crossed Schema $\times$ Context effect, $F(3,240) = 3.60$, $p < .02$, with the Negative and Co-Schematic groups displaying a tendency to take longer to endorse schema-inconsistent romantic/open traits when in the Dating (versus Social) context.

romantic, frank, embarrassed) and four adjectives conceptually related to the positive and negative schema factors (e.g., sexy, liberal, naive).

Subjects were instructed to go through the pages, one at a time, and (from Markus, 1977): "Circle the word if it is a term that describes you. Immediately after you circle an adjective, list the reasons why you feel this adjective is self-descriptive. Give specific evidence from your own past behavior to indicate why you feel a particular trait is self-descriptive. List the first kinds of behaviors that come to your mind... This information is anonymous. Use your own frame of reference." To clarify the task, subjects were given an example in which a respondent had circled the word "Independent" and provided three pieces of behavioral evidence, such as "I don't mind being in the minority on a controversial issue when in a discussion group."

Task 2: Predicting Sexual-Romantic Responses—A second booklet contained a list of 32 interpersonal situations, the majority (75%) of which included sexual or romantic social cues. Each situation was listed twice, followed by the description of either a positive or negative response, which was affective or behavioral in nature. Of the 32 items, 12 described negative reactions to the cues (e.g., "You go to see a movie with a group of female and male friends. Unexpectedly, you find that the movie contains a number of erotic and sexually explicit scenes. While viewing these scenes, you find yourself uncomfortable and embarrassed."); 12 described positive reactions to the same cues (e.g., same stem as above, but "...While viewing these scenes you find yourself interested and sexually aroused/excited."); and 8 were nonsexual filler items (e.g., "While at a social gathering, two of the people in your group get into a lively discussion on a controversial topic. You have strong feelings about the issue, and feel comfortable speaking your mind..."). Items were randomly ordered in such a manner that the positive and negative reactions to the same situation were separated by at least 4 other items. For each item, subjects indicated "how likely or how probable it is that you would behave or react in this way" with a numerical rating ranging from 0 (Not characteristic of you) to 100 (Very characteristic of you).

STUDY I HYPOTHESES

Study I was developed to test two aspects of self-schematic processing. We hypothesized that women with well-elaborated sexual self-schemas would: (1) have access to significant stores of behavioral evidence related to their sexual self-views; and, (2) use their sexual self-views as guides for predicting future responses to sexual-romantic cues. Consequently, we hypothesized different patterns of results across the four schema groups in response to cues related to positive versus negative sexually relevant information.

Our prior data (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998a) suggested that the greatest clarity in group differences would be found between women with a strong valence—Positive or Negative—to their self-view. Specifically, we predicted that the Positive schema group would retrieve more personal experience to support schema-consistent romantic / open traits and assign higher probabilities of responding positively to sexual cues, when compared with Negative schema scorers. The converse, then, should hold for the Negative schema group: Negative scorers should retrieve more personal experience to support schema-consistent embarrassed / conservative traits and assign higher probabilities for negative responses to sexual cues, as compared with their Positive schema counterparts. In addition to these between-group hypotheses, we also predicted within-group differences for these groups. Specifically, we predicted that the Positive schema group would generate more behavioral evidence to support schema-consistent romantic / open (versus schema-inconsistent embarrassed / conservative) traits, and show a greater

likelihood of responding positively (rather than negatively) to sexual situations; whereas the Negative schema group would show the reverse pattern of results.

Results for women without a clearly predominant valence to their self-views (i.e., Aschematics and Co-Schematics) were expected to be more variable. For Aschematics, this would likely occur because of their very weak sexual self-views, whereas for Co-Schematics sexual self-views are salient yet opposing in affective tone. Hence, our hypotheses here were more tentative. Given the likely social desirability bias toward endorsement of romantic/open self-views and positive responses, we expected that Aschematics would show a moderate inclination to retrieve more personal experience related to romantic/open (versus embarrassed/conservative) traits, and to assign higher probabilities for positive (versus negative) responses to sexual cues. However, we also expected absolute differences in responses across the schema groups, such that the scores of the Aschematics (guided by social desirability biases alone, rather than well-articulated sexual self-views) would fall between the more extreme scores of the Positive and Negative groups.

Finally, we predicted that the Co-Schematics would retrieve personal experiences related to both romantic / open and embarrassed / conservative traits. This co-activation of conflicting positive and negative self-views should thereby lead Co-Schematics to assign middling probabilities regarding their likely (positive or negative) responses to sexual-romantic cues. Hence, compared to the Aschematics, Co-Schematics should retrieve more behavioral evidence in response to both romantic / open and embarrassed / conservative traits, but give similarly middling probabilities for responding to sexual-romantic cues in either a positive or negative manner.

RESULTS

Preliminary Analyses and Analysis Plan—Subjects were categorized into one of four schema groups on the basis of their subscores on the positive (Factors 1 and 2) and negative (Factor 3) dimensions of the Sexual Self-Schema Scale.¹ For each task, we conducted a 4×2 mixed-factor ANOVA, with Schema group categorization (i.e., Positive, Co-Schematic, Aschematic, or Negative) as the between-subject factor. For Task 1, Word Type (i.e., romantic / open vs. embarrassed/conservative words) served as the within-subject factor. For Task 2, Response Type (i.e., positive vs. negative responses to sexual-romantic cues) was the within-subject factor. One-way ANOVAs were examined to test for main effects of Schema across each level of the within-subject factors. Finally, planned contrasts within the entire factorial ANOVA were examined to test hypothesized group differences.

Task 1: Retrieving Schema-Relevant Behavioral Evidence—As predicted, women's sexual self-views moderated the relationship between sexual-romantic trait-adjectives and the amount of personal experience subjects retrieved in response to these prompts. Specifically, the 4 (Schema) $\times$ 2 (Word Type) ANOVA calculated for the mean number of words generated to support romantic/open versus embarrassed/conservative adjectives indicated a significant Schema $\times$ Word Type interaction, $F(3,150) = 30.41, P < .001$. See Figure 1a. One-way ANOVAs indicated significant schema effects for number of words generated for both romantic/open [$F(3,149) = 10.44, p < .001$] and embarrassed/

¹For this sample, the mean of the positive schema dimension (sum of Factors 1 and 2) was 79.74 ($SD=12.08$), with a median score of 79.5. The sample mean of the negative dimension (Factor 3) was 22.81 ($SD = 5.93$), with a median score of 23. Median split procedures were performed on the two dimensions utilizing cut-offs based on a larger previous sample of 318 female undergraduates (82/83 for positive schema dimension and 22/23 for the negative schema dimension; see Cyranowski & Andersen, 1998a). This categorization resulted in the following group assignments: Positive (high positive, low negative scorers; $n = 32$); Co-Schematic (high positive, high negative scorers; $n = 37$); Aschematic (low positive, low negative scorers; $n = 39$); and Negative (low positive, high negative scorers; $n = 46$).

conservative [$F(3,149) = 11.76, p < .001$] word—though, as predicted, Schema effects differed for the alternate positive versus negative sexual cues.

As predicted, the Positive schema group generated significantly more evidence in response to schema-consistent romantic / open adjectives (on average, 22.52 words per adjective), when compared to the 11.97 words generated by their Negative schema counterparts ($p < .001$). In contrast, the Negative schema group generated more behavioral evidence in response to schema-consistent embarrassed / conservative traits (on average, 16.6 words per adjective), in contrast to the scant 5.27 words generated by the Positive schema group ($P < .001$). Planned contrasts of within-subject effects indicated that, as predicted, Positive schema scorers generated more evidence for schema-consistent romantic / open cues than for schema-inconsistent embarrassed / conservative cues ($p < .001$); whereas the Negative schema group generated more evidence to support schema-consistent embarrassed / conservative cues than inconsistent romantic / open cues ($p < .01$).

Also as predicted, While the Aschematic group showed a moderate tendency to generate more evidence for the socially desirable romantic / open traits (15.35 words) versus the less desirable embarrassed / conservative traits (11.91 words; $p < .05$), their scores for both word types fell between the more extreme scores of the Positive and Negative schema groups. Finally, the Co-Schematics displayed the expected tendency to generate more evidence than the Aschematics for both romantic / open and embarrassed / conservative cues ($ps < .05$).

Task 2: Predicting Sexual-Romantic Responses—As hypothesized, women's sexual self-views moderated the relationship between sexual-romantic situational cues and subjects' predicted responses to such cues. Specifically, the 4 (Scheme) $\times$ 2 (Response Type) ANOVA calculated for personal predictions of responding in a positive versus negative manner to sexual-romantic cues indicated a significant Schema $\times$ Response Type interaction, $F(3, 149) = 12.60, p < .001$. See Figure 1b. Again, one-way ANOVAs indicated significant, yet opposite, main Schema effects for personal predictions of responding to sexual-romantic cues in a positive manner [$F(3, 149) = 10.78, p < .001$].

As predicted, planned contrasts indicated that the Positive schema group reported a greater likelihood of responding to sexual-romantic cues in a positive manner (reporting a mean probability of 77.39%), When compared with the Negative schema group (57.04%; $p < .001$). In contrast, the Negative schema group reported that they were more likely than the Positive schema group to respond to sexual-romantic cues in a negative manner (43.30% vs. 22.19%, respectively; $p < .001$). Also as predicted, within-subject contrasts indicated that the Positive schema group was significantly more likely to respond positively (77.39%) versus negatively (22.19%) to identical sexual-romantic cues ($p < .001$). Contrary to our predictions, however, the Negative schema group also reported a slightly higher probability of responding positively (57.04%) versus negatively (43.3%) to sexual-romantic cues.

The Aschematic group also displayed this generalized tendency to report higher probabilities of responding positively (62.1%) versus negatively (32.65%) to sexual-romantic cues ($p < .001$), yet again their responses fell between the more extreme probabilities reported by the Positive and Negative schema group. As predicted, the probability ratings of the Aschematic and Co-Schematic groups did not significantly differ from one another for either positive or negative personal probability ratings ($ps < .05$).

DISCUSSION

Findings from Task 1 indicate that individuals with well-articulated sexual self-views have easy access to a significant store of schema-consistent personal experience. Highlighted by the Schema $\times$ Word Type interaction, the Positive schema group generated substantially

more evidence to support schema-consistent romantic / open traits (22.52 words) than schema-inconsistent embarrassed / conservative traits (5.23 words). In contrast, the Negative group generated more evidence to support schema-consistent embarrassed / conservative traits (16.6 words) than schema-inconsistent/open traits (11.97 words) —a notable finding given that this pattern runs contrary to a potentially strong self-enhancing response bias (i.e., generating more personal evidence for negatively toned traits such as naive or self-conscious, versus positively toned traits such as passionate or loving).²

These Task 1 results also provide preliminary support for our hypotheses regarding the Aschematic and Co-Schematic groups. As expected, the Aschematics — who are without relevant self-schema from which to draw behavioral evidence — generated middling levels of evidence to support both romantic / open and embarrassed / conservative traits, falling between the more extreme scores of the Positive and Negative groups. Finally, the Co-Schematics, who hold both positive and negative sexual self-views, retrieved more personal evidence than the Aschematics for both romantic / open and embarrassed/conservative traits. These findings, moreover, cannot be explained by group differences in verbosity, as ANCOVAs controlling for the number of words generated for filler items produced a similar set of results.

Also as predicted, findings from Task 2 indicate that sexual self-schemas are not just markets of past behaviors, but also function as templates from which to guide predictions regarding future sexual-romantic responses. Again, we obtained the hypothesized Schema $\times$ Response Type interaction. When compared with the Negative schema group, Positive schema scorers described themselves as more likely to respond positively to sexual-romantic cues, and less likely to respond negatively to the same cues. Moreover, Positive schema women reported the predicted discrepancy between their reported probabilities of engaging in positive (77.39%) versus negative (22.19%) responses. However, the Negative schema group also displayed a moderate tendency toward endorsing positive versus negative responses to sexual-romantic cues. This finding may highlight a social desirability bias operating in the opposite direction of the hypothesized Schema effect for this group. Hence, although the discrepancy between positive and negative probability ratings is smallest for the Negative group, the schema effect may not have been strong enough to overcome a potent yet opposing social desirability effect that, moreover, is apparent across all four schema groups.

Results of Task 2 lend further support to our predictions regarding the Aschematic and Co-Schematic groups. As hypothesized, the Aschematics (who lack the self-views necessary to guide predictions toward either extreme) gave probabilities for both positive and negative responses that fell between the more extreme scores of the schema-driven Positive and Negative groups. Moreover, the probability ratings of the Co-Schematics were, as predicted, statistically similar to those of the Aschematics. This similarity is deceptive, however, because the middling predictions of the Co-Schematics likely represent the outward result of conflicting positive and negative responses to sexual cues—rather than a lack of schematic activation (see Cyranowski & Andersen, 1998a).

²Our decision to use word counts to quantify subjects' retrieval of personal evidence in response to trait-descriptors is of methodological note. Content ratings of these materials, although possible, would have been problematic given the need to determine reliably what consisted of "unit" of content, which units were sexually relevant for the individual, etc. Hence, we felt that simply counting the number of words written for each of the sexually relevant adjective (i.e., adjectives found to be correlated with sexual outcome in previous research) to be the most unbiased scoring procedure.

STUDY II: TIMED SELF-JUDGMENTS: FURTHER EXAMINATION OF COGNITIVE PROCESSING AND EXPLORATION OF PERSON $\times$ SITUATION INTERACTIONS

Study II was designed to further explore the schematic nature of women's sexual self-views. Specifically, we tested two additional self-schematic hypotheses, namely, that individuals with well-elaborated sexual self-schemas would display differences in the *consistency* and *speed* with which they make sexual/romantic self-judgments. In addition, we hoped to explore the potential impact of contextual cues on sexual schematic processing. Social cognition research highlights the influence and potential interaction of both person and situation variables on schematic processing (Banaji & Prentice, 1994). Similarly, individual differences in sexual self-schemas represent a person variables, that may interact with ongoing contextual cues to determine which and how sexually relevant, stimuli are perceived and interpreted (Bargh, Bond, Lombardi & Tota, 1986; Bargh, Lombardi & Higgins, 1988; Higgins, 1990; Higgins, Bargh, & Lombardi, 1985; Higgins & King, 1981). Hence, a timed self-judgment task was used to test the effect of sexual self-schema on the consistency and speed with which subjects make sexual-romantic self-judgments. Secondly, this task provided a preliminary examination of the role of contextual cues on schematic processing, and the extent to which person $\times$ situation interactions may facilitate (or inhibit) the processing of sexually relevant information about the self.

METHOD

Participants—Participants consisted of 271 female undergraduates enrolled in Psychology 100 at The Ohio State University. Participants were drawn from a screening pool of right-handed, female undergraduates who completed the Sexual Self-Schema Scale as part of voluntary screening conducted during the first week of two successive academic quarters. (See description of the Sexual Self-Schema Scale provided in Study I.) Subjects received course credit for experiment participation. The mean age of subjects was 19.5 years ($SD = 2.61$ years), with a mean education of 13.32 years (between the first and second year of college). Subjects were predominantly Caucasian (81.9%; 8.5% were African American, 4.8% Asian, 1.8% Hispanic, 3% other). Of the subjects, 94% reported a predominantly or exclusively heterosexual orientation.

Measures, Design, and Procedures—Approximately 6 to 8 weeks following prescreening, subjects completed a reaction time task on individual 486 DX-33 MHz computers equipped with SVGA color monitors. The reaction time program was developed with a LABVIEW-based application, and run on Microsoft Windows for Workgroups 3.11. Subjects were instructed to rate a series of trait adjectives as to whether or not each of the words was self-descriptive. Stimulus words were presented individually in a clearly delineated yellow rectangle located in the center of the monitor. Alternate "Me" and "Not Me" response keys were denoted with green and red markers placed on "/" (right side of keyboard) and "z" (left side of keyboard) keys. Instructions emphasized that subjects were to maximize both the speed and accuracy of their responses (see Fazio, 1990).

Subjects were randomly assigned to one of two imagined situational contexts, and were instructed to use this context while making their self-judgments. The contexts consisted of either a general social situation or a dating situation. (See the Appendix for contextual descriptions.)

Data were collected from 5 to 10 subjects at a time. Each person was seated at their own computer in a large room. To learn the task, subjects completed a practice trial of 25 items, after which questions were answered. Instructions were reiterated and then

subjects completed the experimental trial, composed of 24 stimulus items and 24 filler items. Filler items included 12 positive and 12 negative valence adjectives related to the dimensions of intelligence, agreeableness, and humor. Stimulus items consisted of eight words chosen to tap each of the three sexual self-schema factors—Factor 1: romantic/passionate traits (e.g., romantic, exciting, seductive), Factor 2: open/direct traits (e.g., direct, bold, out-going), and, Factor 3: embarrassed/conservative traits (e.g., conservative, self-conscious, nervous). Each set of eight items consisted of four words from the Sexual Self-Schema Scale, and four words conceptually related to each of the three sexual self-schema factors. Each word was presented with a 2-second lapse, and responses were recorded and timed via an internal computer timing device.³ Item order for the experimental trial was randomized across individual subjects.

STUDY II HYPOTHESES

Study II was designed to test two self-schematic postulates: That individuals with well-articulated self-schemas will: (a) show consistency in domain-relevant self-judgments and (b) process domain-relevant information about the self with relative ease. In this timed self-judgment task, both subject responses (“Describes me” vs. “Does not describe me”) and response latencies (or reaction times) were outcomes of interest.

If self-schemas are frequently activated and hence chronically accessible social constructs, women with well-articulated sexual self-views should display consistency in their endorsement of schema-consistent trait-adjectives. Hence, the basic content of these self-views should not be influenced by differing imagined contextual cues. Rather, we predicted only a Schema $\times$ Word Type interaction for subject responses, such that subjects would make self-judgments that were consistent with their sexual self-views regardless of the imagined situational context

Although contextual cues should not change the basic content of one’s self-views, contextual factors may influence the accessibility of particular self-views, and hence the time it takes to make schema-relevant self-judgments. Importantly, Study II was designed to extend our examination of self-schematic processing to include the potential relationship between person and situation sources of schematic accessibility. The contextual priming manipulation was included as a preliminary test of sexual self-schematic processing across two imagined contexts: a general social situation (a cue for only moderate schematic accessibility) and a dating situation (a cue for high schematic accessibility)

Given the preliminary nature of this test and the possibility of a three-way (Schema $\times$ Word Type $\times$ Context) interaction, our predictions here were more tentative in nature. To begin, we hypothesized that possessing specific views of the sexual self would selectively facilitate (or inhibit) the processing of sexually relevant information. Hence, we again expected a Schema $\times$ Word Type interaction to emerge for the time it took subjects to endorse schema consistent versus inconsistent self-views. In addition, we hypothesized that the imagined contextual cues would prime schematic activation for subjects in the Dating context, thereby enhancing response time differences for the Positive and Negative schema groups in this condition.

RESULTS

Preliminary Analyses and Analysis Plan—As with Study I, subjects were categorized into one of four schema groups on the basis of pre-screened Sexual Self-Schema Scale scores.⁴ For our first level of analysis, we conducted 4(Schema) $\times$ 2 (Context) $\times$ 2 (Word

³To minimize the influence of extreme outliers, response times of 9999 ms or more were recorded as missing data.

Type) mixed-factor ANCOVAs (analyses of covariance), with two between-subject factors and one within-subject factor. Between-subject factors included: Schema Group (i.e., Positive, Co-Schematic, Aschematic, or Negative) and Context (i.e., social vs. dating context). The within-subject factor was stimulus Word Type (i.e., romantic/open vs. embarrassed/conservative words). Following our hypotheses, separate analyses were run for both of the dependent variables: (1) response pattern outcomes (i.e., number of “Me” responses to stimulus words), and (2) response latency outcomes. A single covariate was included in each analysis. For response pattern outcomes, endorsement of filler items (i.e., number of “Me” responses) was included as a covariate to eliminate potential confounds due to “yea-saying” or “nay-saying” response biases. For response latency outcomes, mean latencies for filler item endorsements were included as a covariate, to control for individual differences in response latencies due to such factors as reading speed, motor coordination, and motivational differences (see Fazio, 1990, for a discussion).

Sexual-Romantic Self-Judgments—As predicted, women’s sexual self-views moderated the relationship between sexual-romantic cue words and subject endorsements of these adjectives as self-descriptive. Specifically, the 4 (Schema) $\times$ 2 (Context) $\times$ 2 (Word Type) ANCOVA calculated for the number of “Me” responses to cue words indicated a significant Schema $\times$ Word Type interaction, $F(3,249)=25.17, p < .001$. Also as predicted, no significant effects were obtained for Context, the Context $\times$ Word Type interaction, or the 3-way interaction. Finally, predicted Schema effects were obtained across both romantic/open [$F(3,257) = 16.05, p < .001$] and embarrassed/conservative [$F(3,257) = 19.47, p < .001$] words. See Figure 2a for a graphic representation of the Schema $\times$ word Type interaction, collapsed across Context.

As predicted, when compared with the Negative Schema group, Positive schema scorers endorsed a higher percentage of romantic/open adjectives as self-descriptive (82.48% vs. the Negative group’s 62.41%; $p < .001$). In contrast, the Negative schema group endorsed a higher percentage of schema-consistent embarrassed/conservative adjectives (55.48%), as compared with their Positive schema counterparts (31.25%; $p < .001$). Paralleling results of Task 2 in Study I, the Positive schema group showed the predicted discrepancy between endorsement of schema-consistent romantic/open traits (82.48%) versus schema-inconsistent embarrassed/conservative traits (31.25%; $p < .001$), while the Negative schema group also showed a significant (if lesser) tendency to endorse romantic/open over embarrassed/conservative traits (62.41% vs. 55.48%, respectively; $p < .05$).

Response Latencies—Women’s sexual self-views moderated the relationship between sexual-romantic cue words and the amount of time it took subjects to endorse these adjectives as self-descriptive. As predicted, the 4(Schema) $\times$ 2 (Context) $\times$ 2 (Word Type) ANCOVA calculated for mean latencies for endorsing romantic/open versus embarrassed/conservative adjectives indicated a significant Schema $\times$ Word Type interaction, $F(3,240) = 5.32, p < .001$. Contrary to our prediction, however, the 3-way (Schema $\times$ Context $\times$ Word Type) interaction only approached statistical significance, $F(3,240) = 2.41, p = .068$. Similarly, neither the Context $\times$ Schema nor Context $\times$ Word Type interactions were significant; although a main effect for Context did emerge, $F(3,240)=3.81, p < .05$, such that

⁴In line with our previous research (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998a), the sample mean for the positive sexual self-schema dimension was 80.69 ($SD = 11.0$), and the sample mean for the negative sexual self-schema dimension was 21.39 ($SD = 5.78$). As with Study I, median cut-off scores of 82/83 and 22/23 were utilized for the positive and negative schema dimensions, respectively. This median split procedure produced the following group categorization: Positive, $n = 66$; Co-Schematic, $n = 53$; Aschematic, $n = 79$; and, Negative, $n = 73$. Although subjects were initially screened for right-hand dominance, 13 subjects reported being predominantly left-handed on the demographic questionnaire. These left-handed subjects were subsequently removed from analyses, resulting in the following distribution: Positive, $n = 62$; Co-Schematic, $n = 48$; Aschematic, $n = 77$; and Negative, $n = 71$.

subjects generally took longer to respond in the imagined Dating versus Social context. Figure 2b represents the obtained Schema $\times$ Word Type interaction, collapsed across Context. As illustrated here, a main effect for Schema effect is readily apparent in response latency outcomes for embarrassed/conservative adjectives [$F(3,248) = 4.96, p < .01$], with Positive scorers taking significantly longer than the other groups to endorse these adjectives as self-descriptive. In contrast, the Schema effect was not significant for romantic/open endorsement latencies, as all subjects endorsed these adjectives in a relatively rapid fashion.

DISCUSSION

These results support the temporal stability of sexual self-schemas. Specifically, schema categorization obtained at prescreening predicted schema-relevant self-judgments 6 to 8 weeks later. Moreover, as is apparent in Figure 2a, the four sexual self-schema groups exhibited systematic differences in the number of schema-relevant adjectives they endorsed as self-descriptive. Specifically, the Positive group endorsed the highest percentage of romantic/open adjectives as self-descriptive, and the fewest embarrassed/conservative adjectives; whereas the Negative schema group endorsed more embarrassed/conservative words and fewer romantic/open words than their Positive schema counterparts.

Mirroring results in Task 2 of Study I, the Negative schema group did not endorse more schema-consistent than schema-inconsistent traits. Once again, this schematic inconsistency may stem from a social desirability effect seen across the schema groups, that may have attenuated endorsement of undesirable (yet schema-consistent) embarrassed/conservative traits, and inflated endorsement of desirable (yet schema-inconsistent) romantic/open traits for Negative schema scorers.⁵ Alternatively, these schematic inconsistencies may reflect an attenuated effect of negative sexual self-views—relative to positive sexual self-views—on women's cognitive processing of sexually relevant information.⁶

The response latency results provide partial support for the notion that sexual self-schemas influence the speed with which sexually relevant information about the self is processed. We did obtain the predicted Schema $\times$ Word Type interaction; however, this cognitive processing effect was most apparent in endorsement latencies for the embarrassed/conservative cue words (see Figure 2b). As predicted, the Negative group was fastest at making these schema-consistent self-judgments; whereas the Positive group, for whom embarrassed/conservative self-judgments are counter-schematic, took longer to endorse these traits. Unexpectedly, however, there were no Schema group differences apparent in response latencies for the more positively-valenced romantic/open adjectives, as all subjects endorsed these cue words with equal rapidity.

Finally, we did not find the expected Schema $\times$ Context effect within the overall (Schema $\times$ Context $\times$ Word Type) ANCOVA. Notably, this study represented a preliminary test of person $\times$ situation interactions in relation to sexual self-schematic processing, using a relatively weak contextual prime (i.e., “imagining oneself in a particular situation”). Hence, future research utilizing stronger contextual primes may be needed to clarify the potential effects of contextual priming on sexual schematic accessibility.

⁵This “Nuisance” response biases might have been controlled by balancing the positivity or social desirability of cues related to each of the schema dimensions. However, as the labels reflect, the content of the positive and negative schema dimensions include close associations with a particular valence, the essence of which would have been obscured or lost by balancing the valence of stimulus cues. In addition, we note that examination of response times for “Not me” response might have been helpful. Unfortunately, however, analyses of “Not Me” response times for the current data were confounded by significant, differential attrition rates (due to subjects of specific schema groups who responded “Me” to all items in a category).

⁶We would like to thank an anonymous reviewer for suggesting this alternative interpretation of study results.

GENERAL DISCUSSION

The study of sexuality from the perspective of a cognitive information-processing paradigm is a novel advance in the field of sexuality research. But are “sexual self-schemas” truly self-schemas? The current results provide evidence that they are. We tested four referents of self-schematic processing. Results indicate that women with alternative sexual self-schemas display predictably different cognitive patterns in their retrieval of sexual-romantic behavioral evidence; prediction of future responses to sexual-romantic cues; judgments of schema-relevant adjectives as self-descriptive; and, to some extent, the speed with which schema-relevant information about the self is processed.

Examination of the Positive and Negative schema groups—those who hold strong, nonconflicting, and yet opposite sexual self-views—should speak to the consistency of the current results as compared with previous self-schema research. When compared with the Negative schema group, the Positive scorers supplied more personal experience to support romantic/open traits, predicted greater personal probabilities of responding to sexual-romantic cues in a positive manner, and endorsed more romantic/open adjectives as self-descriptive. In contrast, the Negative schema group displayed the opposite pattern: they supplied more behavioral evidence for embarrassed/conservative traits and provided greater probabilities for responding to sexual/romantic cues in a negative manner as compared with Positive schema scorers. In addition, Negative scorers endorsed more embarrassed/conservative traits as self-descriptive, and gave these “Me” responses more rapidly than Positive schema scorers.

An examination of the response patterns of the Aschematic group, or those who lack articulated positive or negative sexual self-views, may serve to further clarify these Negative-Positive schema contrasts. Where as Aschematics should exhibit such general response tendencies as positivity or social desirability biases, they should not exhibit schematically moderated effects when processing sexually relevant information. Current results support this hypothesis. In general, the Aschematic group generated more behavioral evidence for romantic/open (versus embarrassed/conservative) traits, provided greater probabilities of responding to sexual-romantic cues in a positive (versus negative) manner, and endorsed more positive (versus negative) traits as self-descriptive. Yet, for each of these referents, the mean response scores of the Aschematic group consistently fell between the more extreme scores of the Positive and Negative schema groups. Hence, we hypothesize that this pattern reflects a general self-enhancing social desirability effect that would be expected to influence all individuals; thus, the Aschematic pattern may represent a more accurate baseline from which to contrast the schematically moderated patterns of the Positive and Negative schema groups.

Importantly, these results also provide a first look at the cognitive processing of women who hold simultaneously strong positive and strong negative sexual self-views: the Co-Schematics. Our previous research indicated that Co-Schematics report conflicting patterns of sexual-romantic behaviors and responses, including high levels of sexual desire and arousal and a desire for emotional intimacy—in addition to elevated levels of sexual anxiety and fears of being abandoned by relationship partners (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998a). The current data clarify the cognitive aspects of this conflicted pattern. Co-Schematic women endorsed numerous romantic/open traits as well as embarrassed/conservative traits as self-descriptive, and provided ample evidence to support both of these self-views. Like Positive schema scorers, Co-Schematics view themselves as romantic and open individuals who report a strong desire for close, sexual-romantic relationships. However, this desire may be undermined by their negative sexual self-views. Our previous research, for example, suggests an association between conflicting sexual self-

views and an “ambivalent” style of attachment within adult romantic relationships (Cyranowski & Andersen, 1998a).

We have hypothesized that negative sexual self-views may act as a cognitive diathesis within a diathesis-stress model of female sexual difficulty or dysfunction (Cyranowski et al., 1999), and this model has, in fact, received preliminary support. For example, research indicates that women with negative sexual self-views are most likely to show decrements in sexual responsiveness following the stress of breast and gynecologic cancer treatments (Andersen et al., 1997; Yurek et al., 2000). However, future research is needed to delineate the potential cognitive and interpersonal mechanisms by which this vulnerability may operate. For example, certain sexual-romantic contextual cues (such as undressing in front of a sexual partner following mastectomy) may prime the negative sexual self-views of Co-Schematic and Negative schema women. This cognitive priming may, in turn, activate associated negative affects, such as sexual anxiety, and interfere with positive sexual responses, such as sexual arousal—culminating in the onset or persistence of sexual avoidance, difficulty, or dysfunction. Hence, future research designed to examine these potential cognitive, affective, and behavioral processes may help to enhance preventative or rehabilitative clinical interventions—perhaps by challenging women’s negative self-views or counter-conditioning negative responses to sexual cues. Finally, although data support the validity of the Sexual Self-Schema Scale within older samples of healthy heterosexual females and cancer survivors, future research is needed to explore the generalizability of these findings within alternate ethnic/racial groups, as well as homosexual and bisexual populations.

It is important to note both the conceptual and methodological differences between the current research and previous self-schema research paradigms. Schema group categorization in the current study was based upon subject scores across two dimensions of the 26-item Sexual Self-Schema Scale.⁸ This represents a marked deviation from previous techniques employed to measure self-schematic frameworks (e.g., Markus, 1977). Markus defined schematics as those who rated themselves on either of the extreme ends of a bipolar continuum, and who rated this dimension as “important”. In contrast, we assessed positive and negative sexual self-views as independent constructs—a strategy that has been shown to possess discriminative power (Cacioppo & Berntson, 1994; Cyranowski & Andersen, 1998a). Moreover, we retained all subjects for study, utilizing median split procedures to determine group classification, rather than selecting only extreme scorers for research participation. If anything, this may have served to underestimate the obtained effects. Finally, we did not ask subjects to directly rate the perceived importance of their sexual self-views. The unobtrusive nature of the Sexual Self-Schema Scale is, in fact, a valuable feature, given the significant response biases associated with more face-valid sexual assessment techniques (i.e., see Catania et al., 1990; Weinhardt et al., 1998). However, future research utilizing this scale in combination with subjective ratings of the importance of one’s sexuality or sexual self-view would be of interest.

Clearly, the current work was designed to test self-schematic processing in women with alternate sexual self-views. We do not mean to imply, however that men do not hold views

⁸The bivariate scoring procedure functionally combine Factors 1 and 2 of the women’s Sexual Self-Schema Scale to form the positive schema dimension. Notably, previous research indicates related yet distinct sexual-romantic correlations across these factors (see Andersen & Cyranowski, 1994, Table 4); it is therefore possible that some predictive power may be lost in this combination. For studies of group difference, however, use of a “trivariate” classification system would be unwieldy, difficult to interpret, and require large *N*s. There also exist conceptual grounds for use of the bivariate classification, including research on the cognitive compartmentalization of positive and negative self-views (Showers, 1992), and findings that positive and negative self-views may differ in their cognitive organization (see Malle & Horowitz, 1995). Nevertheless, we note that future research using regression models and/or positing highly specified sexual-romantic predictions might harness the full predictive power of the women’s Sexual Self-Schema Scale via the independent assessment of all three sexual self-schema factors.

of the sexual self that may influence their cognitive processing. Indeed, recent research has led to the development of a male version of the Sexual Self-Schema Scale, and the delineation of the factors intrinsic to men's sexual self-views. Not surprisingly, these factors differ somewhat from the women's schema factors—both in terms of factor content and valence (see Andersen et al., 1999, for further detail). Nevertheless, preliminary studies indicate pointed similarities in the relationship between men's sexual self-views and their cognitive processing of sexual-romantic information about the self (Andersen et al., 1999).

CONCLUSIONS

Sexual self-schemas have been defined as cognitive generalizations about sexual aspects of the self that function to guide the processing of sexually relevant social information (Andersen & Cyranowski, 1994). These studies directly test this novel approach to the study of sexuality within a cognitive, information-processing paradigm. Drawing from existing research, we tested four referents of self-schematic processing. As predicted, results indicate that individuals with alternative sexual self-schemas display differences in their retrieval of sexual-romantic behavioral evidence; predicted responses to sexual-romantic social cues; pattern of sexual-romantic self-judgments; and, to some extent, the speed with which sexual-romantic self-judgments are made. This research furthers our understanding of the cognitive aspects of women's sexual self-views, and, in conjunction with prior research, suggests directions for future research regarding the cognitive, affective, and behavioral components of women's sexuality.

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Appendix. Imagined Contextual Primes

Condition A: Social Situation

When you are making these decisions about yourself, try to imagine yourself in a typical *social situation*, or not that might occur, for example, when you are with a group of male and female friends at a friend's home, at a restaurant or bar, or at a party.

Condition B: Dating Situation

When you are making these decisions about yourself, try to imagine yourself in a typical *dating situation*, or one that might occur, for example, when you are with someone that you are attracted—either alone at a restaurant, bar, movie or someone's home, or when you are out with friends.

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FIGURE 1.

(A) Mean number of words written in behavioral self-descriptions elicited by romantic/open versus embarrassed/conservative adjectives, by sexual self-schema group.

(B) Mean personal predictions (rated on scale from 0–100% likelihood) of responding to sexual-romantic social situations in a positive versus negative manner, by sexual self-schema group.

Probability levels for planned comparisons are as follows: * $p < .05$; ** $p < .01$; *** $p < .001$.

FIGURE 2.

(A) Percentage of "Describes Me" responses in timed self-judgment task, by sexual self-schema group.

(B) Mean response latencies for endorsements in timed self-judgment task, by sexual self-schema group.

Results are collapsed across context, and separated by responses to romantic/open versus embarrassed/conservative adjectives. Probability levels for planned comparisons are as follows: $*p < .05$; $**p < .01$; $***p < .001$.