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Psi Chi
Journal of Undergraduate Research

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People are often judged or make judgments in regards to their own appearance and the appearance of those around them. While it seems like others may constantly notice appearances, it is important to understand the extent to which appearances are actually making impressions on others. Recent research (e.g., Horgan, Mast, Hall, & Carter, 2004; Wickham & Morris, 2003; and Yarmey, 2004) has attempted to explore what factors determine appearance accuracy, or our memory for the appearance of people with whom we interact. The present study will examine how those varying in social anxiety and public self-consciousness differ in their abilities to accurately recall the appearance of others.

Gender seems like an obvious factor that would play into appearance accuracy. A recent study by Horgan et al. (2004) examined gender’s effect on memory for the appearance of others. The researchers tested participants for appearance memory of pictures and of other people with whom they were interacting. They found that women scored higher on appearance accuracy tests and that memory for female target appearance was higher than memory for male targets. The researchers further explained that appearance accuracy is an important issue to examine, because so often impressions of another’s appearance molds later perceptions and judgments of them.

The attractiveness of a target is another factor that may seem to influence the degree to which people remember a target’s appearance. A recent study by Wickham and Morris (2003) examined the effect of attractiveness by testing individuals’ ability to recognize whether or not they had previously seen various faces. All faces were previously rated for attractiveness (how “good looking” vs. how “ugly” they were) by other participants to obtain attractiveness ratings for the present study. Participants were shown 44 of a possible 88 pictures. They were then shown all 88 and asked whether or not they had seen each face before. Participants showed no significant differences in the...
ability to remember attractive faces versus less attractive faces. Thus, the research suggests that, at least in regard to facial features, attractiveness has no impact on appearance accuracy.

Appearance accuracy has implications for research on eyewitness accuracy. Psychologists have done extensive research examining memory for the appearance of criminals and how reliable people are at recalling these appearances. For example, Yarmey’s (2004) study examined how identification was affected by variables such as length of interaction, appearance, and whether or not participants were told in advance that they would be tested. One significant finding of the study was that those told in advance of the testing were significantly better at clothing recall, although no advantage was found in physical characteristic recall. This is important to the issue of appearance accuracy, because it implies that recalling physical attributes is difficult for individuals, regardless of whether or not they are actively trying to memorize these attributes.

A related study had participants stopped by a target who acted either friendly or closed off and hesitant (Yarmey, Jacob, & Porter, 2002). The participants and target interacted for either 5 or 30 s, and after separating for 2 min an investigator asked them to participate in the study by trying to recall specific aspects of the target’s physical and clothing characteristics. The researchers found that recall was not affected by the target acting friendly or hesitant. Not surprisingly, results showed that longer observation periods were helpful in appearance recall, especially for the memory of clothing characteristics. When recalling physical characteristics, longer observation periods were still often helpful (e.g., eye color, complexion, etc.) but in some cases (e.g., hair color, age, etc.) both time periods produced a similar rate of recall.

While appearance accuracy has been examined in reference to perception of others and eyewitness recall, not all possible variables affecting this construct have been examined. Attractiveness does not seem to impact appearance accuracy, at least in regards to facial recognition (Wickham & Morris, 2004). However, gender seems to impact appearance accuracy, as does the length of encounter and whether or not participants are anticipating a memory test (Horgan et al., 2004; Yarmey et al., 2002; Yarmey, 2004). While these are important findings, many other factors may affect accuracy for the appearance of others. Two potential predictors of appearance accuracy that have not yet been examined are social anxiety and public self-consciousness.

Social anxiety has been defined as uneasiness in the presence of others or the avoidance of social situations due to fear of scrutiny (Darcy, Davila, & Beck, 2005; Fenigstein, Scheier, & Buss, 1975). Prior research, while not directly examining social anxiety and appearance accuracy, suggests that there may be a relationship between the two characteristics.

For example, social anxiety has been shown to be related to memory recollection. In certain scenarios, Stopa and Bryant (2004) found that individuals high in social anxiety tend to recall memories from an outside observer’s perspective. Socially anxious individuals may tend to do this in situations that produce more anxiety.

Research by Amir, Bower, Briks, and Freshman (2003) involving memory and anxiety also has shown that individuals who are more anxious tend to perform better at implicit memory tasks for socially threatening information. Furthermore, Mogg and Bradley (1998) found that socially anxious individuals tend to view even ambiguous or nonthreatening situations as threatening. This suggests that even in harmless situations, socially anxious individuals are more likely to feel threatened, and therefore might exhibit increased implicit abilities and recall memories from an outsider’s perspective. All of these characteristics could potentially lead to improved memory for the appearance of others.

When looking at anxiety biologically, it appears that anxiety can produce more aware individuals. Mogg and Bradley (1998) found that anxiety can lead to “increased arousal and greater attention to environmental stimuli, especially novel stimuli” (p. 875). This implies that in the present study, in which participants work on a puzzle with a confederate, socially anxious participants may be even more aware of their surroundings, including individuals around them. Individuals low in social anxiety, on the other hand, may not show such attentiveness to their environment.

While socially anxious individuals seem to be biologically and cognitively more prepared to take note of things around them, other factors may have an influence as well. For example, Cash, Theriault, and Natasha (2004) found that higher levels of social-evaluative anxiety were correlated with body image dissatisfaction, dysfunctional investment in appearance, and situational body image dysphoria. This demonstrates that those concerned about what others will think of them also are preoccupied with their body image and appearance. Furthermore, it has been found that individuals with body image problems show increased levels of social comparison (Stormer & Thompson, 1995). If these individuals are engaging in more social comparison, they also are most likely to pay close attention to the appearance of those around them.

Another individual difference variable that may be related to appearance accuracy is public self-consciousness. Public self-consciousness has been defined by Nasby (1989) as the “habitual attentiveness to overt
aspects of the self (e.g., physical appearance and overt behaviors and expressions of affect) that others can observe as well as evaluate” (p. 117). Much research has examined various aspects of public self-consciousness and its’ effects on human behavior.

One area that has been examined is the relationship between public self-consciousness and self-presentation. Researchers have found that those high in public self-consciousness tended to behave in response to how their partner viewed them (Schlenker & Weigold, 1990). When their partner thought of them as independent, they tended to present themselves as nonconforming. However, when their partner thought of them as dependent, they tended to conform. This suggests that those high in public self-consciousness pay close attention to their partner in order to draw assumptions about how their partner feels about them.

Fenigstein and Vanable (1992) sought to examine another behavior related to self-consciousness—paranoia. Paranoia is characterized by a “misconception of oneself as the target of another’s thoughts or actions (p. 2)” and often involves “exaggerated self-referent processing (p. 2).” They found that public self-consciousness was highly correlated with paranoia. From this, it can be inferred that those higher in public self-consciousness are more likely to display paranoid thought. Paranoid thought, in turn, causes an individual to pay greater attention to those around them in order to understand the meaning of the thoughts and actions of others. It also requires more elaborate processing of what they see, which could strengthen the memory of what they observe (Craik & Tulving, 1975).

Another study examined relationships between self-consciousness, self-attention, and social interaction. Fenigstein (1979) discovered that individuals with low public self-consciousness often demonstrate attention that is “consumed by the group activity or other external events—and the group’s behavior in relation to the self is not relevant” (p.77). However, those with a high level of public self-consciousness tend to be very concerned with how they are seen by others. Therefore, the “group’s behavior is perceived as having personal relevance” to the individual (Fenigstein, 1979, p.77). This research suggests that when people do not have a high level of public self-consciousness, they are more likely to be focused on activities, rather than paying careful attention to those around them. This distinction is important in reference to the present study because participants will be establishing a memory for the appearance of others while working on a task. This research is also important because if individuals high in public self-consciousness are really noting behavior in reference to themselves, it has been found that they are much more likely to remember it (Symons & Johnson, 1997).

A study examining self-consciousness and clothing, performed by Solomon and Schopler (1982), had participants complete a survey to examine the relationship between public self-consciousness and various clothing measures. The clothing measure that generated the highest overall correlation for both genders was the one between public self-consciousness and the degree to which what other people wear influences the individuals’ impressions of them. This suggests that publicly self-conscious individuals pay close attention to the clothing and appearance of others, since they are trying to form opinions based on these features.

Public self-consciousness also was found to correlate positively with a characteristic known as appearance anxiety (Dion, Dion, & Keelan, 1990). Appearance anxiety was defined as “apprehension concerning different aspects of one’s physical appearance and how others evaluate them” (p. 220). Research showed that appearance anxiety correlated positively with other forms of social anxiety, including interaction, audience, and test anxiety. These findings indicate that publicly self-conscious individuals are more concerned about their appearance and suggest they may also be more aware of the appearances of those around them.

Appearance accuracy has been found to be an important topic of study. Appearance often affects our judgments of others. Thus, it is important in a wide range of activities, from building relationships with coworkers to recognizing criminals. While many studies have been done in this area, none thus far have looked at the effects of social anxiety and public self-consciousness on appearance accuracy. Social anxiety is expected to correlate with increased appearance anxiety due to the fact that socially anxious individuals often recite memories from an observer perspective, tend to feel threatened and therefore to be more successful in implicit memory tasks, and exhibit increased arousal (Amir et al., 2003; Mogg & Bradley, 1998; Stopa & Bryant, 2004). Individuals high in public self-consciousness also are expected to perform well on appearance accuracy tests. This is due to the fact that individuals high in public self-consciousness are examining others closely, demonstrate paranoid and self-referent processing, and pay attention to clothing of others (Craik & Tulving, 1975; Fenigstein & Vanable, 1992; Schlenker & Weigold, 1990; Solomon & Schopler, 1982; Symons & Johnson, 1997).

Method

Participants

Participants were 53 undergraduate students from a large southeastern university. The sample was gath-
tered by having several students on campus recruit other undergraduates who did not know the confederate. The confederate was a 20-year-old female student from the university. Participation in the study was voluntary. Fifty-one percent of the participants were men and 49% were women. The ethnicity distribution was as follows: 85% Caucasian, 8% African American, 6% Asian, and 2% Indian. Participants ranged in age from 18 to 22, with an average age of 19. The majority of the participants were underclassmen, although all class-standing levels were represented (36% freshmen, 43% sophomores, 15% juniors, and 6% seniors).

Materials

Social anxiety. The social anxiety component of the Self-Consciousness scale was administered to all participants to measure levels of social anxiety (Fenigstein et al., 1975; see Appendix A). The scale consisted of six items such as “It takes me time to overcome my shyness in new situations” and “large groups make me nervous”. Participants were asked to respond to each item with their level of agreement on a 5-point Likert Scale from 1 (not at all characteristic of me) to 5 (very characteristic of me). Negative items were reverse scored. The scale’s test-retest correlation was .73 (Fenigstein et al., 1975). In the present study, a Cronbach alpha of .82 was obtained. The social anxiety subscale has been used in numerous studies, including one by Neto and Barros (2000) that found social anxiety to have a positive correlation with loneliness in adolescents and young adults.

Public self-consciousness. Public self-consciousness was measured for all participants with the public self-consciousness component of the Self-Consciousness Scale (Fenigstein et al., 1975; see Appendix B). The scale consisted of seven items such as “I usually worry about making a good impression” and “I’m usually aware of my appearance”. Participants responded to the items with their level of agreement on a 5-point scale from 1 (not at all characteristic of me) to 5 (very characteristic of me). The scale has a test-retest reliability of .84 (Fenigstein et al., 1975). In the present study, the Cronbach alpha was .61. The public self-consciousness scale is widely used. Bushman (1993) provided predictive validity for the scale by showing that scores on the scale predicted ratings of brand-name and bargain-name products.

Appearance accuracy. The appearance accuracy questionnaire followed immediately after the public self-consciousness and social anxiety scales. The questionnaire consisted of five open-ended questions derived from those used in a previous study performed by Horgan et al. (2004; see Appendix C). The questions asked for descriptions of the confederate’s hair, type of clothing top, type of clothing bottom, shoes, and any other details about appearance that the participant could recall. Each participant received an appearance accuracy score based on how many characteristics of the appearance of the confederate were named out of all possible characteristics listed for each question. A list of descriptive words for each question was created by the confederate and a small team of assistants prior to the start of the experiment (See Appendix D). Participants were given one point for every correct descriptive word they gave that was on the approved list (for example, when describing hair, points were awarded for the words “brown,” “straight,” etc.). A total number of incorrect responses also was recorded for each participant. Responses that were irrelevant (ie., whether the confederate seemed friendly, guesses about the past experience of the confederate, etc.) were not rewarded with a point even if true, but were not counted against the participant either. Specific makeup characteristics were not used either, seeing as though the confederate’s makeup was more pronounced during studies that were earlier in the day, whereas in studies that occurred in the late afternoon, makeup was fading off.

Procedure

Each participant was taken into a private room with the experimenter and the confederate. The confederate gave the impression that she also was a participant and had just previously walked in the room and began reading the instructions. After reading the informational letter, the experimenter instructed the participant and confederate to introduce themselves and then to begin working on a miniature 50-piece jigsaw puzzle. While the confederate knew the purpose of the study, she was completely unaware of the social anxiety and public self-consciousness scores of the participants and did not know any of the participants from previous experience. All participants were required to stand and were situated on the side of a table with the confederate on the adjacent side so that the participant could get a full view of the confederate while working if he or she wished. After 4 min, the experimenter asked the participant and confederate to stop working on the puzzle. Both the participant and confederate were told that they needed to complete a questionnaire and the experimenter asked the participant to step out of the room because both “participants” needed to be in separate rooms to answer. The participant completed the questionnaires and knocked on the door to return it to the experimenter when he or she had completed it.
Results

Descriptive Statistics and Correlations With Appearance Accuracy

The average social anxiety score on a 1–5 scale was measured with 1 being the lowest in social anxiety and 5 being the highest in social anxiety. Social anxiety was found to be relatively low (M = 2.74, SD = .95). The average public self-consciousness score on a 1–5 scale was measured with 1 being the lowest in public self-consciousness and 5 being the highest in public self-consciousness. The average public self-consciousness score was moderate (M = 3.29, SD = .56). A significant positive correlation was found between social anxiety and appearance accuracy (r = .28, p < .05). The correlation between public self-consciousness and appearance accuracy was found to be not significant (r = .20, p = .16).

Gender Differences

An independent samples t test was conducted to examine possible differences in performance on the appearance accuracy questions between men and women. A significant difference between genders was found regarding the number of correct appearance characteristics named, t(52) = -2.22, p = .03. Women scored significantly higher with a M = 6.88, while for men, M = 5.59. Another significant difference was found between men and women on the number of incorrect responses, t(52) = 2.50, p < .02. Women had a significantly lower number of incorrect responses, M = 1.15, as compared to men, M = 2.26.

Predictors of Appearance Accuracy

A multiple regression was run to determine if social anxiety and public self-consciousness were working together to account for variance in appearance accuracy or if either of these factors was a unique predictor. Using a standard multiple regression, public self-consciousness was not found to be a significant unique predictor of appearance accuracy, t(52) = 1.47, p = .15. Social anxiety, on the other hand, was found to be a significant unique predictor of appearance accuracy, t(52) = 2.07, p = .05.

Discussion

The main focus of this study was to examine the relationships between social anxiety, public self-consciousness, and appearance accuracy. Appearance is an important aspect of our social interactions. Understanding different factors that could determine the degree to which we take note of the appearance of others could have implications in a number of areas. Public self-consciousness did not show a significant correlation with appearance accuracy. However, social anxiety did show a significant correlation with appearance accuracy.

Social anxiety was found to be significantly correlated with appearance accuracy, thereby supporting the hypothesis that these constructs are related. This suggests that perhaps individuals with high social anxiety are more alert and are remembering more information implicitly when placed in a new situation with another individual (Amir et al., 2003; Mogg & Bradley, 1998). Social anxiety was found to be a unique predictor of appearance accuracy. Future research might choose to examine what specific aspects of social anxiety cause individuals who are more anxious to perform well on appearance accuracy tasks. These results could have implications in several other areas. For instance, could socially anxious individuals’ eyewitness testimony be more accurate? Also, it could be true that individuals high in social anxiety are mentally recording greater amounts of appearance information and are perhaps more likely to allow these memories to affect their judgments of a person. This could have implications in job interviews, where employers meet with potential employees for only a minimal amount of time and later make judgments about who they will hire. Could socially anxious employers be more likely to make decisions based on appearance because they are more likely to recall and take note of appearances in general? While none of these conclusions can be drawn from the present study, further research could explore the relationship between social anxiety and appearance accuracy in various contexts.

Public self-consciousness was originally thought to correlate positively with appearance accuracy due to the fact that people who are more publicly self-conscious tend to be very concerned with what others think of them, and therefore they might spend more time observing another individual than someone who was less publicly self-conscious (Schlenker & Weigold, 1990). Perhaps those high in public self-consciousness spend more time thinking about how they are presenting themselves and what their partner could possibly be thinking, rather than really observing their partner’s behavior and appearance.

Another interesting finding of the study was gender differences in appearance accuracy. Women were found to produce more correct responses and fewer incorrect responses. This finding is consistent with previous research performed by Horgan et al. (2004) that found that women performed better on appearance accuracy tests. This is another aspect of appearance accuracy that could be examined more fully in the future. Are women more reliable in reporting...
appearances and to what extent do women make judgments based upon appearance as compared to men? Further research could provide more insight into the reasons for and the implications of gender differences in appearance accuracy.

While the present study did produce interesting findings, particularly the correlation between social anxiety and appearance accuracy, it is important to note that there were some limitations to the study and areas in which it could be improved. First of all, the sample size was relatively small. A larger sample size could possibly have resulted in stronger correlations and more significant findings, particularly in regard to public self-consciousness. In addition, the Cronbach alpha for the public self-consciousness scale was lower than expected and could potentially be a result of the small sample size. Furthermore, the study included a southeastern college student sample that may or may not be representative of people in general. Could it be that college students are more aware of appearance in general? Is appearance more or less of a defining feature in the southern part of the country? Future studies may wish to include a wider assortment of individuals.

This study has uncovered some preliminary findings that need to be further examined. In the future, it would be interesting to conduct a study similar to the present study that has a larger sample size and looks at public self-consciousness and social anxiety as well as other factors such as personality type, paranoia, and so forth. As mentioned previously, appearance affects many areas of our lives and it would be beneficial to understand the different variables that affect the extent to which we notice and remember appearances of others. In the present study, participants worked on a basic puzzle. However, there are many other types of interactions that could be performed. For example, if participants did an activity that forced more interpersonal interaction, results might show increased memory for the appearance of one’s partner. Finally, I think it is important to continue research on social anxiety’s effect on appearance accuracy and try to determine exactly what about social anxiety causes individuals high in this characteristic to perform better on appearance accuracy tests.

References
APPENDIX A
Please indicate how characteristic each of the following statements is of you on the following scale. Indicate your choice by placing a number in the blank before each item.

1 2 3 4 5
Not at all Very
Characteristic of me Characteristic of me

1. It takes me time to overcome my shyness in new situations.
2. I have trouble working when someone is watching me.
3. I get embarrassed very easily.
4. I don’t find it hard to talk to a stranger.
5. I feel anxious when I speak in front of a group.
6. Large groups make me nervous.

APPENDIX B
Please indicate how characteristic each of the following statements is of you on the following scale. Indicate your choice by placing a number in the blank before each item.

1 2 3 4 5
Not at all Very
Characteristic of me Characteristic of me

1. I’m concerned about my style of doing things.
2. I’m very concerned about the way I present myself.
3. I’m very self-conscious about the way I look.
4. I usually worry about making a good impression.
5. One of the last things I do before I leave the house is look in the mirror.
6. I’m concerned about what other people think of me.
7. I’m usually aware of my appearance

APPENDIX C
Please answer the following questions to the best of your ability.

1. Describe your partner’s hair (style, color, length, etc.).
2. Describe the kind of shirt or top your partner wore (type, colors, logos, design, layers, etc.).
3. Describe the kind of pants/skirt your partner wore (type, color, length, design, etc.).
4. Describe the kind of shoes your partner wore (type, color, design, etc.).
5. What other details about your partner’s appearance can you remember? Mention anything you are pretty sure about (e.g. makeup or jewelry, other items of clothing, nationality, notable physical features).

APPENDIX D
Descriptive word key

1. Brown, Straight, Short, Low Ponytail, Side Part, 2 in. Part, Black Ponytail Holder, 2 Bobby Pins
2. Pink, Short-Sleeved, Pink & White Stripes on Collar, 2 Buttons, Round Neck
3. Blue Jeans, Folded Under
4. Pink Flip-Flops, Jewels, Flat
5. Pink Nail Polish, Silver Round Watch, Silver Chain Bracelet with Heart, White/Caucasian, Dark Eyebrows, Scar on Finger, Fair Skin, Blue-Green Eyes, Pearl Earrings, Short (in height), White Belt with Silver Buckle

*Note: answers deemed basically the same in meaning as the words given here also were given credit*
Personality greatly influences an individual's behaviors and attitudes (Morris & Maisto, 2005; Paunonen & Ashton, 2001). To illustrate, personality has been shown to be related to vocational interests (Gottfredson, Jones, & Holland, 1993), student achievement (Aluja & Blanch, 2004), leadership ability (Judge & Bono, 2000), marriage and life satisfaction (Johnson, McGue, Krueger, & Bouchard, 2004), social relationships (Asendorph & Wilpers, 1998), and social-cognitive development in children (Hart, Keller, Edlestein, & Hofmann, 1998). In addition, a teacher's personality has been shown to predict both teacher performance and student ability (Erdle, Murray & Rushton, 1985; Murray, Rushton & Paunonen, 1990; Phillips, Carlisle, Hautala & Larson, 1985).

Gottfredson et al. (1993) maintains that personality can be a predictive factor for both career and college majors in that specific personality traits correspond with preferred jobs and majors. Indeed, people generally are more satisfied when their careers or college majors match the interests associated with certain personality traits. For example, openness is defined as imaginative and independent thinking. In accordance with this definition, individuals high in openness tend to be more satisfied in careers where they are able to express themselves (e.g., art) when compared to those low in openness (Gottfredson et al.).

Furthermore, Holland (1996) contends that there is a significant correlation between personality traits and corresponding interests and aspirations with not only job satisfaction, but also with job stability and career continuity (e.g., staying in jobs that belong to the same occupational category). In addition, he states that congruency of interests and job were positively associated with job satisfaction. Support for this finding was also applied to college students and their choice of major. Past investigations of this effect have clearly indicated that with students who are satisfied with their choice of major, they always include interest in the course content as a reason for being and staying in a particular field (Holland, 1996). This is also cited when students drop or change majors, and, therefore, indicates that their interests, based on their personality, have strong influences in major, job choice, and satisfaction.

Though a clear consensus does not appear to exist regarding the characteristics that compose one's personality, Costa and McCrae's (1985) five trait con-
CEPTUALIZATION, KNOWN AS THE BIG FIVE, APPEARS TO BE THE MOST WIDELY USED AND EMPIRICALLY VALIDATED THEORY. THESE FIVE DOMAINS CONSIST OF DIFFERENT ATTRIBUTES OF BEHAVIOR, INCLUDING LIKES AND DISLIKES, THAT HAVE BEEN SHOWN TO POSITIVELY CORRELATE WITH A PERSON'S PERSONALITY AS CLASSIFIED INTO A BIG FIVE GROUP OF TRAITS. THE BIG FIVE PERSONALITY TRAITS ARE OPENNESS (IMAGINATIVE AND INDEPENDENT THINKING), CONSCIENTIOUSNESS (SENSIBILITY, DEPENDABILITY), EXTRAVERSION (SOCIALITY, ASSERTIVENESS), AGREEABLENESS (CO-OPERATION, TRUSTWORTHINESS), AND NEUROTICISM (ANXIETY, DEPRESSION). INDIVIDUALS CAN BE EVALUATED IN TERMS OF THE DEGREE TO WHICH A PERSON EXHIBITS QUALITIES OF EACH TRAIT. FOR EXAMPLE, BEING “HIGH IN OPENNESS” CONSISTS OF HAVING IMAGINATIVE, INDEPENDENT, AND DIVERGENT THINKING QUALITIES, WHEREAS BEING “LOW IN OPENNESS” WOULD SUGGEST THE OPPOSITE OR LESSER EMPHASIS ON THE SAME TRAITS.

Moreover, DeNeve and Cooper (1998) conducted a meta-analysis of personality traits and Subjective Well-Being (SWB). An analysis of the Big Five revealed that neuroticism is the most significant predictor of life satisfaction when compared to the other Big Five personality traits. Additionally, conscientiousness was found to be the strongest positive correlate of life satisfaction while extroversion and agreeableness were equal predictors of positive affect. Openness obtained the lowest correlation with life satisfaction. Using these findings as a guide, the current study analyzed the relationship between these personality traits (openness and agreeableness, extraversion, conscientiousness, and neuroticism) and academic satisfaction. Thus, these hypothesis were developed based on these groupings and used in the analysis.

The present study investigated the relationship between the Big Five personality traits, college major, and academic satisfaction, which was represented as one’s satisfaction with his or her chosen major. It was hypothesized that both an individual’s personality and his or her choice of major would predict academic satisfaction. Specifically, it was hypothesized that neuroticism, conscientiousness, extraversion, and agreeableness would be significant predictors of academic satisfaction. Additionally, it was hypothesized that openness would not be a significant predictor. Finally, based on research by Gottfredson et al. (1993), it was hypothesized that major would be a significant predictor of academic satisfaction.

Method

Participants

The sample consisted of 144 undergraduate college students with the majority being European American (96.5%) and women (75.7%). Elementary education majors consisted of 7 men and 69 women. Secondary education majors were composed of 28 men and 40 women. Participants ranged from 18 to 28 years of age (M = 20.64 and SD = 2.04). There were 76 students in the elementary education program and 68 students in the secondary education program. Seven students did not meet criteria for major but were enrolled in a class designed for either elementary or secondary education. These participants completed the measures but were excluded from analyses due to not meeting desired sample criteria.

Material

The Personal Data Sheet (PDS) contained questions about gender, age, ethnicity, college majors and total number of times the student changed majors. Moreover, a single-item was created and piloted to assess academic satisfaction. Specifically, participants were asked to rate the degree to which they were satisfied with their present college major. This was a Likert scale ranging from 1 to 5 with higher numbers indicative of higher satisfaction.

International Personality Item Pool (IPIP). The IPIP is based on the five major personality traits (e.g., the Big Five) as defined by Costa and McCrae (1985). The IPIP contains specific statements about personality characteristics. Participants were asked to rate the degree to which they agreed that the statement was reflective of their behavior. Some examples include “I have frequent mood swings” and “I know how to captivate people.” A number of items negatively load on their respective factors and were subsequently reversed scored. The IPIP uses a Likert scale ranging from 1 to 5 with higher numbers indicative of stronger agreement with the statement.

The IPIP has strong convergent validity as it correlated with the revised NEO Personality Inventory, an assessment measuring general personality and behavioral domains, with validity coefficients ranging from .85 to .92. Items on the NEO represent a 5-point Likert scale with six areas measuring specific traits of Neuroticism (N), Extraversion (E), and Openness to Experience (O; Costa & McCrae, 1988). Furthermore, questionnaire validity was assessed through participants’ self-reports of each behavior and its relationship with the five personality traits measured. Specifically, participants were asked to report the degree to which their actions were related to each of the Big Five traits. These results were used as support for construct validity (Buchanon, 2004).

Procedures

Data were collected during classroom instruction time. Classes were chosen based on preliminary permission of the instructor who viewed all materials.
before giving consent. Individual student consent was also obtained. Each participant was instructed to complete the packets at the beginning of the class lecture. Participants were allowed as much time as needed to complete the packet. The majority of students completed the packet within 15 min. Upon completion, participants were debriefed and thanked for their participation.

Results

Data Transformation

Before analyses were conducted, factor scores were created for each independent factor using the item loadings and factor structure provided by the original authors as a guide. Gender, ethnicity, and major were dummy coded as the following, respectfully: women = 0, men = 1; European American = 0, other = 1; elementary education = 0, secondary education = 1. Participants above the age of one standard deviation from the preliminary mean (i.e., 22.37) were eliminated from all analyses in order to eliminate outliers. Therefore, no participant fell below one standard deviation from the mean age.

Analyses

A correlation matrix yielded no significant relationship between the demographic and criterion variable academic satisfaction (see Table 1). Therefore, these variables were not entered into the regression model. Major, however, was significantly correlated with academic satisfaction ($R = -.18$, $p < .03$), suggesting that being an elementary education major was related with greater academic satisfaction.

Regressional Analyses

In order to assess the role of major and the Big Five personality traits in predicting academic satisfaction, a linear regression was conducted. The overall regression model was not significant, $F(6,126) = 1.99,$

| TABLE 1 | Intercorrelations, Means, and Standard Deviations of Demographic Variables and Academic Satisfaction |
|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|
| Variable        | Ethnicity | Major | Gender | Year | Satisfaction |
| Ethnicity       | Major | .05 | | | | |
| Sex             | .07 | .37** | | | | |
| Year            | .11 | -.22** | -.09 | | | |
| Academic Satisfaction | -.01 | -.18* | -.00 | .15 | | |
| $M$             | .04 | .47 | .24 | 2.75 | 3.43 |
| $SD$            | .18 | .50 | .43 | .77 | .63 |

Note: *$p < .05$. **$p < .01$. |

| TABLE 2 | Regression Analysis Summary for Major and the Big Five Personality Traits as Predictors of Academic Satisfaction |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Variable        | $R^2$ | $R^2$ Change | $F$ Change | Sig. |
| Major           | .03 | .03 | 4.32 | .04 |
| Openness        | .05 | .01 | .92 | ns |
| Agreeableness   | ns | | ns | |
| Conscientiousness | .05 | .01 | 1.90 | ns |
| Extraversion    | .09 | .01 | | ns |
| Neuroticism     | ns | | | |

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Personality as a Potential Predictor  □ Schaick, Kovacik, Hallman, Diaz, and Morrison

Using academic satisfaction as the criterion, major was entered in Block I, openness and agreeableness in Block II, and conscientiousness, extraversion, and neuroticism in Block III. Results suggested that major \( F(1, 142) = 4.33, p = .03, \eta^2 = .03 \) and conscientiousness \( F(1, 142) = 1.90, p = .05, \eta^2 = .04 \) significantly predicted academic satisfaction. Specifically, elementary education majors were more satisfied than secondary education majors. Additionally, the regression indicated that all other variables (openness, agreeableness, extraversion, and neuroticism) did not significantly predict academic satisfaction. An analysis of the squared semipartial values suggested that conscientiousness accounted for approximately 4% of the variance in academic satisfaction while major accounted for approximately 3% (See Table 2).

**Discussion**

Gottfredson et al. (1993) maintains that personality is predictive of special interests and skills. Consistent with our hypothesis, specific personality traits (i.e., conscientiousness) appear to have an influence on career path or choice of academic major. Additionally, when compared to secondary education majors, elementary education students reported significantly more academic satisfaction, suggesting that aspiring elementary school teachers are more satisfied in their major.

Consistent with our hypotheses, conscientiousness and major were significant predictors of academic satisfaction. On the other hand, neuroticism, extraversion, and agreeableness were not significant predictors of academic satisfaction. Therefore, people who more conscientious tend to have higher levels of academic satisfaction than people who scored higher on the other four personality traits. This supports DeNeve and Cooper’s (1998) conclusions that certain personality traits have an effect on satisfaction. More specifically, individuals who are conscientious participate in behavior that is goal directed and exhibit an internal locus of control, thus contributing to overall quality of life (DeNeve & Cooper, 1998).

In evaluating the construction and results of the current study, several limitations were present. Due to the small size of the sample population, a factor analysis was not conducted. Therefore, the relationship between major and specific personality traits (i.e., extraversion) was not investigated. Future researchers should evaluate the effects of these characteristics on choosing a college major and apply the results to personality testing designed for career choice. Perhaps individuals, if specific traits were clearly examined, could better predict a field that would be most satisfying for them.

Second, several concerns were noted regarding questionnaire completion. To illustrate, certain participants did not complete all questionnaire items and subsequently were not included in the analyses, thus reducing the power. Moreover, a select group of participants completed the study directly before taking an exam. To this end, these students may not have answered the items accurately due to attention factors such as stress and anxiety that arise because of the impending exam.

Finally, only one item was used to assess academic satisfaction. Therefore, it is unclear if the construct of academic satisfaction was reliably and validly assessed. Future research should use a well-established scale that accurately measures this construct.

Taking into account these limitations, future researchers should use a larger sample size to increase power and increase the probability of obtaining a clear factor structure. This would enable the examination of more specific relationships. To illustrate, does extraversion predict enrollment with elementary education major and not secondary education major? In further investigating this aspect, specific characteristics in the curriculum of future elementary school teachers could be examined as a possible addition to secondary education classes in order to increase satisfaction. Additionally, examining teacher perceptions of the major could result in differences with satisfaction. If students, for example, are happier with their professors in their major, perceived satisfaction with the major could be increased. That is, satisfaction with the professor could be a moderating variable. Based on these data, academic advisement may be more efficacious if certain personality traits (i.e., conscientiousness) of the student are assessed and discussed as a factor in choice of college major due to the significant relationship between conscientiousness and academic satisfaction. Moreover, a more accurate decision as to the role of personality in college planning may be explored upon further replication of these findings.

Overall, the present study was consistent with previous research concerning personality as a predictive factor in academic satisfaction (Gottfredson et al., 1993). In terms of the role conscientiousness played in academic satisfaction, elementary education majors displayed higher satisfaction when compared to secondary education majors. Based on the results, personality, as a whole, should not be the deciding factor in essential career choices among college students. Rather, a personal evaluation of individual strengths, weaknesses, interests, goals, and specific personality traits may represent a more useful method of career selection.
References


Have you ever forgotten a noteworthy event from your past, and then suddenly remembered that event many years later? If so, you may have experienced a phenomenon known as a recovered memory, in which an event that has been forgotten for an extended period of time (i.e., weeks, months, years, or sometimes decades) is once again recollected. Although researchers have documented several cases of reported recovered memories (e.g., Read, 1997; Read & Lindsay, 2000; Schooler, Ambadar, & Bendiksen, 1997), the idea that memories can be forgotten and then resurface after a period of “amnesia” remains controversial (e.g., Read & Lindsay, 2000). Adding to the complexity of this issue are findings that demonstrate that memory for past episodes of remembering is subject to error (e.g., Arnold & Lindsay, 2002, 2005; Schooler et al.). One finding in particular is the forgot-it-all-along (FIA) effect: a memory phenomenon in which prior episodes of remembering are forgotten (Arnold & Lindsay, 2002; Schooler et al., 1997). Schooler et al. first used the term—for got-it-all-along—in their study of real-world cases in which individuals reported recovered memories of childhood sexual abuse (CSA). In this study, Schooler et al. found that two women who had reported recovering a memory of CSA had forgotten prior episodes of remembering the abuse during the period of time when the abuse was supposedly forgotten. That is, these women had talked to others about the abuse during the alleged period of amnesia. Schooler et al.’s findings raise several questions for memory researchers. Specifically, under what circumstances do we forget that we have previously remembered something? When

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**Memory of Remembering: Investigating theForgot-It-All-Along Effect Using Pictures**

Forgot-it-all-along (FIA) refers to a memory phenomenon wherein prior episodes of remembering are forgotten. Arnold and Lindsay (2002, 2005) found that when a word is remembered in different ways on separate occasions, individuals are more likely to forget recalling the word on the first occasion. The FIA effect has also been observed for autobiographical stimuli, which typically contain a stronger visual imagery component relative to verbal stimuli (Rubin, 2005). To reduce the gap between verbal and autobiographical stimuli, the present study investigated whether a FIA effect could be obtained using pictorial stimuli. Forty-eight undergraduate students studied 48 homographs, each presented in one of two contexts. Homographs were presented as words for some subjects, as line drawings for others. Context (studied vs. other) was manipulated across two successive cued-recall tests. For each item on the second cued recall test, subjects were asked if they had recalled that item on the first test. Results revealed an equivalent FIA effect for pictorial and word stimuli. The findings are interpreted within the transfer-appropriate processing and source monitoring frameworks.

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D. Stephen Lindsay*
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1 Some professionals refer to the period of forgetting as a period of “amnesia” for the remembered event. Other professionals deem this terminology inappropriate. For an in depth look at the issues surrounding recovered memories, see Read (1997) and McNally, Clancy, and Barrett (2004).

2 The “forgot-it-all-along” effect was named in reference to Fischoff’s (1977) “knew-it-all-along” effect, which refers to an overestimation of prior knowledge.

* Faculty supervisor
we make judgments about our previous recollections, to what extent do we believe our judgments are accurate? What mechanisms underlie judgments of prior recollection?

The Forgot-It-All-Along Effect

According to Tulving’s encoding specificity principle and the closely related notion of transfer-appropriate processing (Morris, Bransford, & Franks, 1977), memory is better when processes at encoding and retrieval match (Tulving & Thomson, 1973). The women described in Schooler et al.’s (1997) case studies might have remembered their abuse in qualitatively different ways on separate occasions (e.g., retrieving abstract knowledge that the abuse happened to them vs. recollecting emotionally charged details of the abuse). If so, then the newer way of remembering the abuse would be a poor cue for retrieving memories of prior instances in which the abuse was thought about in the older way, causing previous episodes of remembering the abuse to be forgotten (i.e., the FIA effect). To test this contention, Arnold and Lindsay (2002, 2005) conducted a series of laboratory experiments in which participants were cued to recall words in the same versus qualitatively different ways across two cued-recall tests. Arnold and Lindsay hypothesized that participants would more often forget having recalled a word on the first test when they had been cued to think about that word differently on the two tests, exhibiting the FIA effect.

In the Arnold and Lindsay (2002, 2005) FIA procedure, participants are led to think of neutral homographs (words with two dominant meanings) in qualitatively different ways across two cued-recall tests. They found that when meanings of homographs were manipulated across tests, participants were significantly more likely to forget their previous recollections of the words. Even subtle shifts, such as changing a word’s context without changing its meaning, produced a FIA effect (Arnold & Lindsay, 2005). Moreover, data from a confidence rating scale indicated that participants were quite confident in their previous recall judgments, even when these judgments were incorrect.

Current Study

The FIA effect has been observed for memories of autobiographical events (e.g., Schooler et al., 1997), and experimentally manipulated in studies of memory for words (e.g., Arnold & Lindsay, 2002, 2005). Verbal memory, however, is much less complex than autobiographical memory, which contains richer and more distinctive memory characteristics (Dewhurst & Conway, 1994). Specifically, autobiographical memory contains a strong visual imagery component, a characteristic that has been shown to play a central role in remembering autobiographical stimuli (Rubin, 2005). To reduce the gap between the FIA effect observed for autobiographical memories and memories of words, the current study used pictorial stimuli, which also have a visual imagery component. In a variant of the Arnold and Lindsay (2002, 2005) FIA paradigm, we investigated whether a FIA effect could be obtained when participants studied pictures. A control group was included in which participants studied words only. We hypothesized that when an item is remembered in qualitatively different ways across two cued-recall tests, individuals are more likely to forget recalling the item on the first test (i.e., the FIA effect). In addition, based on previous research on the picture superiority effect (e.g., Dewhurst & Conway), we expected recall to be superior for participants who studied pictures compared to those who studied words. Of greatest interest, we tested the hypothesis that the FIA effect may diminish in size for participants who study pictures relative to those who study words. Finally, we tested the hypothesis that participants would be more confident in their previous recall judgments when cued to remember items in the same context compared to different contexts across the two cued-recall tests. Confidence ratings were also used to show that participants were not merely guessing when making their previous recall judgments.

Method

Participants

Forty-eight University of Victoria undergraduates (40 women) in an introductory psychology course participated in exchange for extra credit. Most participants (94%) were first-year university aged (18–22 years). For participants for whom English is a second language, the experimenter judged whether the student had a sufficient understanding of English prior to commencement of the experiment. Nine participants were judged to have an insufficient understanding of English, and their data were excluded from the analyses.

Design

This experiment used a 2 x 3 x 2 mixed factorial design. The between-subjects independent variable was type of stimuli studied in Phase 1 (pictures vs. words). The within-subjects independent variables were (a) type of cue sentence received in Phase 2 (studied-context vs. other-context vs. not tested) and (b) type of cue sentence received in Phase 3 (studied-context vs. other-context). Combined, these two within-subjects independent variables created six conditions: (i) Test 1 studied - Test 2 studied, (ii) Test 1 stud-
ied - Test 2 other, (iv) Test 1 other - Test 2 studied, (v) Test 1 not tested - Test 2 studied, (vi) Test 1 not tested - Test 2 other.

Materials
Stimuli were 48 homographs, each with two distinct meanings. Homographs were chosen from the following sources: Arnold and Lindsay’s (2002, 2005) previous FIA studies; the Comp.Speech Frequently Asked Questions website (Comp.Speech, 1997); a study by Dick, Hernandez, Janyan, Opei, Palacios, and Saccuman (2005); and a study by Ferraro and Kellas (1990). Each of the homographs’ two meanings were matched with (a) a related black and white line drawing, (b) a related cue word, and (c) a cue sentence containing the corresponding cue word and a row of asterisk symbols representing the target word. For example, the homograph CALF was matched with a picture of the calf of a leg and the cue word cow. The corresponding sentences were “Amy had a bruise on the _ _ _ _ of her leg” and “The mother cow nursed her baby _ _ _ _.” All sentences were similar in length and structure and were created by the first author, with the exception of two sentences derived from Arnold and Lindsay (2002, 2005). Pictures were obtained from the Center for Research in Language-International Picture-Naming Project (Dick et al., 2005), an artist by commission, and various free Internet clipart websites.5

The study list consisted of the 48 homographs in a unique random order for each participant. For half of the participants, homographs were presented as words (words condition); for others, as pictures along with the corresponding target word to ensure that participants thought of the picture as intended (pictures condition). The meanings of target homographs were randomized across all participants so that no two study lists were alike.

The Phase 2 test list consisted of sentence cues for two-thirds of the target homographs studied in Phase 1 (one-third of the target homographs were not tested—not tested condition). Cue sentences contained a word fragment (the first and last letters of a target word separated by dashes) and a related cue word (e.g., “The mother cow nursed her baby C _ _ F”). One-third of the target homographs were cued in their studied context (studied-context condition), whereas the other third were cued in their nonstudied context (other-context condition). Order of cue sentences was randomized anew for each participant.

The test list for Phase 3 consisted of all 48 target homographs studied in Phase 1. Again, cues were sentences containing a word fragment and a related cue word. Each participant received a unique order of cues (chosen at random), half of which matched the studied context, the other half of which were cued in the other context (orthogonally crossed with Phase 2 condition).

One primacy and one recency buffer was used to bypass primary and recency effects in Phases 1, 2, and 3. Both buffers were homographs, studied and cued in only one context.

Procedure
Prior to commencement of the experiment, participants gave informed consent for participation by reading and signing the consent form. Participants were then tested individually on an IBM compatible personal computer with the experimenter sitting beside them. The experiment was programmed in E-Prime. Each participant took approximately 50 minutes to complete all tasks.

In Phase 1, participants studied 48 target homographs. Half of the participants studied the target homographs as line drawings (pictures condition), whereas the other half studied the target homographs as words (words condition). Each target-picture or target-word pair was presented for 2 seconds. Participants were instructed to say each target word (emphasized in capital letters) aloud as it appeared on the screen in preparation for a subsequent memory test. Participants were further instructed to think of the target word in the context of its paired picture or word. After saying each target homograph aloud, a sentence containing a corresponding cue word and a row of asterisk symbols for the target homograph was presented for 5 s. Participants were instructed to read the sentence aloud and fill in the asterisk symbols with the target word. After the 5 seconds elapsed, the corresponding target-picture or target-word pair re-appeared on the screen for 1 second.

In Phase 2, participants in both the pictures condition and the words condition were given sentences as cues to recall two-thirds of the target homographs. Participants were informed that the sentences might or might not correspond to the sentences they had seen in Phase 1, but that the sentences were always related to target words in some way. Participants were also informed that some of the target words would not be tested.

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5 A complete list of the stimuli used in this study can be obtained by contacting the first author.
Each cue sentence was presented for 3.5 s. Participants were instructed to recall target words aloud only if they remembered seeing the word in Phase 1. To avoid word-fragment completion and guessing, participants were instructed to say “pass” if they knew the correct target word, but did not remember seeing it in Phase 1. Participants received item-by-item feedback in the form of a “ding” sound, and the word correct for correct responses, and a tone sound for incorrect and “pass” responses.

Following Phase 2, participants engaged in a Stroop task as a distracter task for 15 min. The Stroop task involved naming the colours in which colour-name words or groups of symbols were printed.

Phase 3 consisted of a cued-recall test for all 48 target homographs. Participants were once again informed that the cue sentences may or may not correspond to the sentences they had seen in Phase 1, but that they were always related to target words in some way. Participants were reminded to respond only if they remembered seeing the target word in Phase 1, and to say “pass” if they did not remember the target word from Phase 1. Participants received the same item-by-item feedback as in Phase 2. This time, however, the correct target homograph appeared on the screen after participants made their response. In addition, on each trial, participants were asked to indicate if they remembered recalling the target word on the first test by saying “yes” or “no,” and to rate their confidence in their judgments on a 6-point scale (1 = very uncertain; 2 = uncertain; 3 = somewhat uncertain; 4 = somewhat certain; 5 = certain; 6 = very certain). Participants were reminded that some of the target words were not tested on the first test, and therefore it would not make sense to remember recalling words that were not tested. Participants were reminded one or two times throughout the task that the judgment should be based on their memory of recalling words, not whether they remembered being tested for the words.

After completing all three phases of the experiment, participants were debriefed and given extra credit for their introductory psychology course.

Results

All analyses used a criterion of $\alpha = .05$. Effect sizes were calculated using Cohen’s $d$ for comparisons between 2 groups, and partial $\eta^2$ for comparisons involving more than 2 groups. Within-subject con-

6 Due to the presence of an unusually low score in the Test 1 other-context group, the assumption of homogeneity of variances was not met. Values from the Greenhouse-Geisser test are reported.

7 Due to the presence of outliers, the assumption of homogeneity of variances was not met for the Test 2 studied/studied pictures and words group, and the Test 2 other/studied pictures group. Values from the Greenhouse-Geisser test are reported.

dence intervals were calculated using Masson and Loftus’s (2003) equation using the error term from the interaction effect.

Recall Performance

Mean proportions of target words correctly recalled for each condition of Test 1 and Test 2 are shown in Table 1. Proportions of target words correctly recalled on Test 1 were analyzed in a 2 (Test 1: studied-context vs. other-context) × 2 (studied pictures vs. words) mixed factorial analysis of variance (ANOVA). Results indicated that correct recall on Test 1 was significantly higher for target words cued with studied-context sentences ($M = .96, SD = .05$) compared to target words cued with other-context sentences ($M = .70, SD = .17$), $F(1, 46) = 92.60, d = 1.44, p < .01$. Studying pictures ($M = .82, SD = .14$) versus words ($M = .85, SD = .09$) had no influence on Test 1 recall performance, $F(1, 46) = 1.17, n.s.$.

Proportions of target words correctly recalled on Test 2 were analyzed in a 3 (Test 1: studied-context vs. other-context vs. not tested) × 2 (Test 2: studied-context vs. other-context) × 2 (studied pictures vs. words) mixed factorial ANOVA. Results revealed a main effect of Test 2 context. Correct recall on Test 2 was significantly higher for target words cued with studied-context sentences on Test 2 ($M = .97, SD = .06$) compared to target words cued with other-context sentences on Test 2 ($M = .85, SD = .14$), $F(1, 46) = 114.19, d = .87, p < .01$.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tr>
<td>Mean Proportion of Items Correctly Recalled</td>
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<tr>
<td>Test 1/Test 2 Cues</td>
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<tr>
<td>Pictures</td>
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<td>Studied/Studied</td>
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<td>Not Tested/Studied</td>
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<td>Words</td>
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<td>Not Tested/Studied</td>
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<td>Studied/Other</td>
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<tr>
<td>Other/Other</td>
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<td>Not Tested/Other</td>
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Note. Standard deviations are in parentheses.
Correct recall on Test 2 was also influenced by Test 1, \( F(1, 46) = 6.25 \), partial \( \eta^2 = .12 \); \( p < .01 \). Planned comparisons revealed that Test 2 recall performance was higher for target words cued with studied-context sentences on Test 1 (\( M = .94, SD = .07 \)) compared to those cued with other-context sentences on Test 1 (\( M = .89, SD = .11 \)), \( t(47) = 3.27, d = .95, p < .01 \), and target words not tested on Test 1 (\( M = .90, SD = .11 \)), \( t(47) = 2.72, d = .79, p < .01 \).

There was no interaction between context on Test 1 and Test 2, \( F < 1 \). As well, studying pictures (\( M = .91, SD = .10 \)) versus words (\( M = .91, SD = .10 \)) had no effect on Test 2 recall performance, \( Fs < 1 \) for the main effect and interactions.

**Judgment of Previous Recollection**

As with Arnold and Lindsay’s (2002, 2005) FIA studies, the subsequent analyses were performed on prior-recall judgment data for target words correctly recalled on both Test 1 and Test 2. The proportions of correct “yes” judgments were analyzed in a 2 (Test 1: studied-context vs. other-context) \( \times \) 2 (Test 2: studied-context vs. other-context) \( \times \) 2 (studied pictures vs. words) mixed factorial ANOVA. A main effect of Test 1 context was found. Participants were significantly more likely to correctly judge target words as “recalled” on Test 1 when target words were cued with their studied-context sentences on Test 1 (\( M = .84, SD = .17 \)) compared to their other-context sentences on Test 1 (\( M = .79, SD = .21 \)), \( F(1, 46) = 6.39, d = 1.10, p < .05 \). Studying pictures (\( M = .82, SD = .20 \)) versus words (\( M = .81, SD = .18 \)) had no effect on previous recall judgments, \( F < 1 \).

As expected, there was a significant interaction between context on Test 1 and context on Test 2, \( F(1, 46) = 28.84 \), partial \( \eta^2 = .39 \); \( p < .01 \) (see Figures 1a and 1b). Planned comparisons showed that for target words cued with studied-context sentences on Test 1, participants were more likely to forget their previous recall when those target words were cued with other-context sentences on Test 2 (\( M = .76, SD = .24 \)) compared to when they were cued with studied-context sentences on Test 2 (\( M = .92, SD = .10 \)), \( t(47) = 5.43, d = 1.58, p < .01 \). Conversely, for target words cued with other-context sentences on Test 1, participants were more likely to forget their previous recall when those target words were cued with studied-context sentences on Test 2 (\( M = .70, SD = .25 \)) compared to other-context sentences on Test 2 (\( M = .88, SD = .16 \)), \( t(47) = 6.51, d = 1.90, p < .01 \).

**False Positives**

False positives were analyzed in a 2 (Test 1 not tested/Test 2 studied-context vs. Test 1 not tested/Test2 other-context) \( \times \) 2 (studied pictures vs. words) mixed factorial ANOVA.\(^8\) Results revealed a main effect of Test 2 context. For target words that were not tested on Test 1, participants were significantly more likely to
falsely judge a target word as having been recalled on Test 1 when they were cued with studied-context sentences on Test 2 ($M = .17, SD = .23$) compared to items cued with other-context sentences on Test 2 ($M = .11, SD = .16$), $F(1, 46) = 5.90, d = 1.08, p < .05$ (see Figure 2). Interestingly, a near-significant effect of studying pictures versus words was found: Participants who studied words were more likely to falsely judge that they had recalled target words that were not tested in Test 1 ($M = .18, SD = .22$) compared to participants who studied pictures ($M = .09, SD = .16$), $F(1, 46) = 3.51, d = .46, p < .10$.

Confidence Ratings

Mean confidence ratings for each condition are shown in Table 2. Overall, participants were confident in their prior-recall judgments. The subsequent analyses were performed on prior-recall-judgment confidence ratings for target words correctly recalled on both Test 1 and Test 2. Confidence ratings were analyzed in a $2 \times 2 \times 2$ mixed factorial ANOVA. Results revealed a marginally significant main effect of Test 1 context. Participants were more confident in their previous recall judgments when target words were cued with studied-context sentences ($M = 5.15, SD = .56$) compared to target words cued with other-context sentences ($M = 5.00, SD = .75$) on Test 1, $F(1, 46) = 4.02, d = 1.00, p < .05$. Studying pictures ($M = 5.05, SD = .69$) versus words ($M = 5.10, SD = .62$) had no effect on level of confidence, $F < 1$.

Results also revealed a significant interaction between Test 1 and Test 2 context on confidence, $F(1, 46) = 15.25, partial \eta^2 = 0.25, p < .01$. Planned comparisons revealed that for target words cued with studied-context sentences on Test 1, participants were significantly more confident in their previous recall judgments of target words cued with studied-context sentences on Test 2 ($M = 5.26, SD = .54$) compared to target words cued with other-context sentences on Test 2 ($M = 5.03, SD = .60$), $t(47) = 2.85, d = .83, p < .01$. Conversely, for target words cued with other-context sentences on Test 1, participants were significantly more confident in their previous recall judgments of target words cued with other-context sentences on Test 2 ($M = 5.11, SD = .73$) compared to target words cued with studied-context sentences on Test 2 ($M = 4.90, SD = .76$), $t(46) = 2.51, d = .74, p < .05$.

Discussion

As hypothesized, results show a substantial FIA effect for participants who studied pictures and for those who studied words. When participants were led to remember target words in different ways across two cued-recall tests, they were significantly more likely to forget previously recalling those words on the first test. Moreover, the observed FIA effect occurred regardless of which direction context was manipulated (i.e., the FIA effect occurred for both the Test 1: studied/Test

---

**TABLE 2**

**Mean Confidence Rating for Each Condition**

<table>
<thead>
<tr>
<th>Test 1/Test 2 Cues</th>
<th>Confidence Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pictures</strong></td>
<td></td>
</tr>
<tr>
<td>Studied/Studied</td>
<td>5.26 (.49)</td>
</tr>
<tr>
<td>Other/Studied</td>
<td>4.83 (.86)</td>
</tr>
<tr>
<td>Not Tested/Studied</td>
<td>4.65 (.72)</td>
</tr>
<tr>
<td>Studied/Other</td>
<td>4.95 (.67)</td>
</tr>
<tr>
<td>Other/Other</td>
<td>5.16 (.75)</td>
</tr>
<tr>
<td>Not Tested/Other</td>
<td>4.70 (.87)</td>
</tr>
<tr>
<td><strong>Words</strong></td>
<td></td>
</tr>
<tr>
<td>Studied/Studied</td>
<td>5.30 (.56)</td>
</tr>
<tr>
<td>Other/Studied</td>
<td>4.96 (.66)</td>
</tr>
<tr>
<td>Not Tested/Studied</td>
<td>4.66 (.69)</td>
</tr>
<tr>
<td>Studied/Other</td>
<td>5.09 (.54)</td>
</tr>
<tr>
<td>Other/Other</td>
<td>5.07 (.73)</td>
</tr>
<tr>
<td>Not Tested/Other</td>
<td>4.48 (.65)</td>
</tr>
</tbody>
</table>

*Note. Standard deviations are in parentheses.*
The study supports the existence of a FIA effect that can generalize to verbal and pictorial stimuli.
When individuals remember a stimulus in qualitatively different ways on separate occasions, they more often forget remembering the stimulus on the first occasion. Implications of the FIA effect can be found in clinical settings, where the practice of uncovering forgotten memories of trauma is sometimes used. Individuals are encouraged to bring to mind forgotten memories of traumatic events in an effort to promote healing and closure. When using clinical techniques involving recovering memories of past events, it is important for clinicians to be aware that memories of remembering traumatic events can also be forgotten.

References
Countless risk factors and environmental stressors disrupt children’s psychological adjustment, in turn shaping the course of socioemotional and behavioral development. One of the most prominent and disconcerting environmental risks to an adolescent’s well-being is living in a low-income neighborhood (see Brooks-Gunn & Duncan, 1997, for review; Cauce, Stewart, Rodriguez, Cochran, & Ginzler, 2003). One of the ways in which inner-city environments have been shown to affect adolescents’ mental health is through exposure to community (Cauce et al.; Gorman-Smith & Tolan, 1998). In fact, the threat of victimization and witnessing violence are among the greatest risks of living in an urban environment. Unfortunately, these risks disproportionately affect adolescents who may be more vulnerable to their dangerous communities than more experienced and capable adults (Cauce et al.).

The extremely high prevalence of child and adolescent exposure to violence in U.S. inner-cities is alarming (Bell & Jenkins, 1993; Berman, Kurtines, Silverman, & Serafini, 1996; Dempsey, 2002; Farrell & Bruce, 1997; Gorman-Smith & Tolan, 1998; Kupersmidt, Shahinfar, & Voegler-Lee, 2002; Miller, Neugebauer, Gorman-Smith, & Kamboukos, 1999; Richters & Martinez, 1993). Researchers have reported that 80-100% of inner-city adolescents have witnessed some form of violence in their communities (Berman et al.; Gorman-Smith & Tolan, 1998; Overstreet & Braun, 2000; Overstreet, Dempsey, Graham, & Moely, 1999). Moreover, the violent events to which urban adolescents are exposed are not isolated experiences.
MEDIATORS AND MODERATORS OF VIOLENCE EXPOSURE □ Barrett

(Kupersmidt et al.) but rather contribute to a chronic atmosphere of violence (Garbarino, 1999; Overstreet et al., 1999). The current situation is so staggering that Koop and Lundberg (1992) have declared the rising rates of violence in the United States a public health emergency.

As one might expect, exposure to community violence has a wide range of negative consequences for children’s well-being. Children who witness violence in their neighborhoods or undergo direct victimization are at elevated risk for PTSD (Overstreet et al., 1999; Overstreet & Braun, 2000; Gorman-Smith & Tolan, 2003) and depression (Martinez & Richters, 1993; Fitzpatrick, 1993; Farrell & Bruce, 1997). More compelling, however, are the findings that children and adolescents who are exposed to community violence have heightened levels of aggression and delinquency (DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994; Durant, Pendergrast, & Cadenhead, 1994; Farrell & Bruce; Gorman-Smith & Tolan, 1998; Gorman-Smith & Tolan, 2003; Linares et al., 2001; Miller et al., 1999; Nofziger & Kurtz, 2005; Schwab-Stone et al., 1995; Schwartz & Proctor, 2000). In fact, some studies have shown that exposure to violence is the strongest predictor of delinquency among low-income adolescents (Bolland, McCallum, Lian, Bailey, & Rowan, 2001).

A burgeoning line of research aims to identify why exposure to violence predicts juvenile delinquency. Social learning theory postulates that a positive perception of outcomes is the mechanism by which witnessing violence causes later engagement in aggressive acts (Bandura, 1973). Through encounters with violence in their communities, adolescents come to emulate the aggressive actions that they witness, viewing them as important and rewarding responses to stressful or problematic situations (Farrell & Bruce, 1997; Schwartz & Proctor, 2000). An alternative hypothesis is that adolescents who are naturally aggressive select themselves into violent environments by associating with violent peers (Gorman-Smith & Tolan, 1998). Exposure to violence, then, is the effect of their aggressive tendencies rather than the cause. Yet another theory suggests that adolescents become desensitized to the violence they view over time and eventually perceive the use of aggression as normative, (Gorman-Smith & Tolan, 1998), thereby disinhibiting their participation in delinquent acts.

The theoretical framework guiding the present study postulates that life satisfaction and risk-taking behaviors (MacDonald, Piquero, Valois, & Zullig, 2005), along with feelings of hopelessness about the future (Bolland, 2003; Bolland et al., 2001; DuRant, Cadenhead et al., 1994), strongly predict aggression in youths exposed to violence. Indeed, many adolescents who are exposed to chronic neighborhood violence view it as purposeless and believe that their fates are out of their control (Lorion & Saltzman, 1993), leading to the belief that they will die before reaching adulthood (Greene, 1993) and other pessimistic future expectations (Schwab-Stone et al., 1995). Garbarino (1999) defines this cognitive style as a “loss of future orientation” and argues that it provokes seemingly practical responses such as fatalistic violence and antisocial behavior (p. 422). Hence, ample evidence suggests that adolescents’ negative cognitions regarding the future link the association between exposure to violence and delinquency.

One theory driving the research on hopelessness as a mediating factor between exposure to violence and delinquency proposes that urban adolescents see their world as a hostile and dangerous place devoid of hope for success or survival. As a result, they engage in risky, immediately gratifying behaviors because they have developed little regard for the safety of themselves or others (Lorion & Saltzman, 1993). Teenagers living in conditions of chronic violence create their own standards for immediate success rather than vainly striving for long-term goals that many do not believe they will ever achieve (Anderson, 1999), and this self-defined measure of success is usually based upon physical displays of aggression that reflect one’s power and authority over other members of the community (Bolland et al., 2001). The high prevalence of hopelessness among inner-city youth supports the notion that adolescents who are exposed to violence acquire very negative outlooks for their futures and low expectations of living through their twenties (Jones & Newman, 1997; MacLeod, 1987; Martinez & Richters, 1993). As a result, adolescents may attempt to glean as much pleasure from the present as possible reasoning that the immediate rewards of their behaviors outweigh the possibility of long-term consequences.

Despite the strong correlation between exposure to violence and teen delinquency, many individuals do not develop behavioral problems, but remain resilient (DuRant, Cadenhead et al., 1994; Cauce et al., 2003). A fertile question in the field is what factors serve to protect urban adolescents who have been exposed to violence. Some researchers have found that maternal support (Kliwer, Lepore, Oskin, & Johnson, 1998), perceived social support (Berman et al., 1996), and parental closeness and monitoring protect against the negative behavioral effects of living in a risky neighborhood (Schwartz & Proctor, 2000), though not among a group of 10- to 15-year-old African Americans (Overstreet et al., 1999). Moreover, investigators have found reversed patterns of moderation, such that adolescents experiencing low parent-child conflict and
high family structure stability are more affected by exposure to violence than their peers living in less optimal familial situations (Gorman-Smith & Tolan, 1998; Miller et al., 1999). These inconsistent findings suggest that protective factors may differ according to age, social class, and ethnic group (Kupersmidt et al., 2002) and highlight the need for additional research examining the proposed moderators.

Although the current literature provides an extensive overview of the relation between exposure to violence and adolescent delinquency, several limitations exist among many of the studies that impede interpretation of the results. For example, Overstreet and colleagues (1999) maintained that both victimization and more distal witnessing of violence yielded similar outcomes for adolescents. However, a substantial body of evidence supports the notion that they are categorically distinct constructs with unique consequences (Kupersmidt et al., 2002), such that victimization is more predictive of emotional distress whereas witnessing community violence leads to behavioral problems (Farrell & Bruce, 1997; Fitzpatrick, 1993). Many studies have collapsed victimization and witnessing into one general measure of “exposure to violence” (DuRant, Pendergrast, & Cadenhead, 1994; Gorman-Smith & Tolan, 1998; Overstreet et al., 1999); therefore, more sensitive measures of the two separate risk factors will disentangle differences in outcomes.

Another limitation of existing studies is that, with the exception of one prospective longitudinal study (Miller et al., 1999), all data have been cross-sectional in nature, enabling only correlational analyses that do not provide particularly strong evidence for the existence of causal relations among the variables (Bolland, 2003; DuRant, Cadenhead et al., 1994; DuRant, Pendergrast, & Cadenhead, 1994; Farrell & Bruce, 1997; Gorman-Smith & Tolan, 1998; MacDonald et al., 2005; Martinez & Richters, 1993; Nozelfger & Kurtz, 2005; Overstreet & Braun, 2000; Overstreet et al., 1999; Schwab-Stone et al., 1995; Schwartz & Proctor, 2000). For example, it is not clear in these studies whether exposure to violence causes delinquency, delinquency causes one to become exposed to violence, or whether some third variable explains the association between exposure to violence and delinquency. The present study addresses this problem by using longitudinal data which allow us to establish the temporal ordering of exposure to violence and adolescent delinquency. If we determine that exposure to violence at one point in time is associated with delinquency at a later point in time, we can refute the hypothesis that delinquency caused the exposure to violence because an event cannot logically bring about events that came before it. Therefore, we can more reasonably infer that exposure to violence played a causal role in the development of delinquency.

Furthermore, small sample sizes (Miller et al., 1999; Overstreet & Braun, 2000), a wide age range of participants (Linares et al., 2001; Richters & Martinez, 1993; Martinez & Richters, 1993; Schwartz & Proctor, 2000), and an extremely specific population—composed of low-income, inner-city, predominantly African American adolescents—limit the generalizability of current results (Berman et al., 1996; Bolland, 2003; Bolland et al., 2001; Dempsey, 2002; Farrell & Bruce, 1997; Fitzpatrick, 1993; Gorman-Smith & Tolan, 1998; Martinez & Richters; Miller et al., 1999; Overstreet and Braun, 2000; Overstreet et al., 1999; Perez-Smith, Albus, & Weist, 2001; Richters & Martinez). Although a high-risk sample has the benefit of isolating the population of adolescents who are most likely to witness high levels of violence and therefore be at risk for negative outcomes, it is not clear whether the findings would generalize to other groups.

The present study aims to establish a prospective relation between exposure to violence at one point in time and adolescent delinquency at a later point in time and to test mediators and moderators of this association. We hypothesize that exposure to community violence by way of witnessing violent events will significantly predict adolescent delinquency, even when controlling for demographic covariates and prior teen delinquency. Furthermore, we propose that cognitive styles characterized by low expectations for the future, depression, and low satisfaction with one’s neighborhood will uniquely explain the variance in adolescent delinquency and will explain why exposure to violence increases risk for delinquency. Finally, we postulate that parental control and parental closeness, specifically closeness to one’s mother, will moderate the effects of exposure to community violence on adolescents’ behavioral problems; that is, adolescents who receive high levels of parental support will exhibit lower levels of delinquency when exposed to violence than their exposed peers who lack parental support.

Method

Sample

The data for the present study were taken from the National Longitudinal Survey of Adolescent Health1, a public-use dataset which examines the general health and behaviors of a nationally-representative sample of adolescents (n = 6,504). The first wave of the study took place between 1994 and 1995 when participants were in grades 7 through 12. Adolescents

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1Delinquency measures for wave 1 and wave 2 and the depression measure may be viewed at http://www.cpc.unc.edu/projects/addhealth/codebooks
were surveyed both at home and in school, and parents completed an in-home questionnaire. Wave 2 commenced the following year and included only in-home interviews with a subset of participants \( (n = 4,804) \). Wave 3 took place between 2001 and 2002 and included further follow-up interviews in participants’ homes. The data for the analyses herein come from the wave 1 and wave 2 home interviews and the parent questionnaire. Table 1 displays the composition of the sample by ethnicity, age, and gender. Only data from adolescents who participated in both the wave 1 and wave 2 interviews and thus earned a wave 2 delinquency score were included in the analyses \( (n = 4,780) \).

**Measures**

**Household income.** We obtained the annual household income for each participant at wave 1 using a single item on the parent questionnaire. Respondents disclosed yearly household incomes with responses (in thousands of dollars) ranging from 1 to 999 \( (\text{Mdn} = 40.0, \text{SD} = 57.4) \).

**Exposure to violence.** A single item measured exposure to violence at wave 1 that asked participants how many times they had seen someone shoot or stab another person in the past 12 months. Adolescents reported whether they had never \( (0) \), once \( (1) \), or more than once \( (2) \) seen someone shot or stabbed \( (M = .15, SD = .44) \).

**TABLE 1**

Characteristics of the Sample

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2,279</td>
<td>47.7%</td>
</tr>
<tr>
<td>Female</td>
<td>2,501</td>
<td>52.3%</td>
</tr>
<tr>
<td><strong>Age at Wave 1</strong></td>
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<tr>
<td>11-13</td>
<td>868</td>
<td>18.2%</td>
</tr>
<tr>
<td>14-16</td>
<td>2,833</td>
<td>59.3%</td>
</tr>
<tr>
<td>17-18</td>
<td>1,036</td>
<td>21.7%</td>
</tr>
<tr>
<td>19-21</td>
<td>43</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>2,807</td>
<td>58.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>555</td>
<td>11.6%</td>
</tr>
<tr>
<td>African American</td>
<td>1,016</td>
<td>21.3%</td>
</tr>
<tr>
<td>Asian</td>
<td>148</td>
<td>3.1%</td>
</tr>
<tr>
<td>Other</td>
<td>254</td>
<td>5.3%</td>
</tr>
</tbody>
</table>

**Delinquency.** Adolescent delinquency was measured at wave 1 and wave 2. At wave 1, participants disclosed how frequently in the past 12 months they committed 15 delinquent acts (e.g., “take something from a store without paying for it,” “get into a serious physical fight”). Responses ranged from never \( (0) \) to 5 or more times \( (3) \) and were recoded to reflect whether the adolescent had \( (1) \) or had not \( (0) \) committed a given delinquent act. We summed responses to the 15 questions, creating a total delinquency scale score at wave 1 for each participant ranging from 0 to 15 \( (M = 2.74, SD = 2.79) \). The internal consistency of the wave 1 delinquency scale was acceptable \( (\alpha = .80) \).

At wave 2, adolescents reported how frequently in the past 12 months they committed each of 13 delinquent acts (e.g., “take something from a store without paying for it,” “take part in a fight where a group of your friends was against another group”). The wave 2 delinquency measure was nearly identical to the wave 1 measure, with the exception that the original wave 2 questionnaire excluded two of the items from the wave 1 measure (see items 5 and 6) for reasons unknown to the author. Again, responses ranged from never \( (0) \) to 5 or more times \( (3) \) and were recoded to reflect whether the adolescent had \( (1) \) or had not \( (0) \) committed a given delinquent act. We summed responses to the 13 questions, yielding a total delinquency scale score at wave 2 for each participant ranging from 0 to 15, \( (M = 1.95, SD = 2.22) \), indicating the total number of types of delinquent acts each student committed within the past year. The internal consistency of the wave 2 delinquency scale was acceptable \( (\alpha = .77) \).

**Neighborhood satisfaction.** Adolescents’ overall satisfaction with their neighborhoods at wave 1 was measured by combining responses from seven items. Five of the items measured neighborhood cohesion. Participants indicated whether the given neighborhood characteristic was \( (1) \) or was not \( (0) \) true of their communities (e.g., “you know most people in your neighborhood,” “you feel safe in your neighborhood”). Responses were summed to create a neighborhood score ranging from 0 to 5, such that higher scores indicated a greater level of neighborhood cohesion. The remaining 2 items asked adolescents how happy they were to be living in their neighborhoods, with responses ranging from very unhappy \( (1) \) to very happy \( (5) \), and how happy they would be to move, with responses ranging from very happy \( (1) \) to very unhappy \( (5) \). In both cases, higher scores reflected adolescents’ greater levels of happiness with their neighborhoods. Finally, we summed and standardized responses on all items to compute a composite neighborhood satisfaction scale ranging from -2.64 to 1.25 \( (M = 0, SD = 1.0) \), with higher scores reflecting greater levels of overall neighboring communities

hood satisfaction. The neighborhood satisfaction scale yielded modest internal consistency (α = .62).

Future expectations. Adolescents reported their levels of hopefulness for the future at wave 2 using 6 items. Two of the questions asked adolescents to rate the likelihood of living to age 35, with responses ranging from *almost no chance* (1) to *almost certain* (5), and the likelihood of being killed by age 21, with responses ranging from *almost certain* (1) to *almost no chance* (5); thus, higher scores indicated greater hope for the future. In addition, adolescents reported on risk-taking characteristics of their personalities as a proxy to determine levels of hopefulness for the future. Students indicated whether they agreed or disagreed (1 = *strongly agree* to 5 = *strongly disagree*) with the statements that they live without thought for the future, rely on “gut feelings” when making decisions, like to take risks, and evaluate the outcomes of decisions (reversed). Higher scores indicated less risk-taking behaviors, thus representing greater positive expectations for the future. While risk-taking behaviors are not inherently indicative of adolescents’ hopefulness about the future, they provide a more concrete measure of how much value adolescents place on the future than hypothetical statements about future expectations. For example, if an adolescent often makes decisions or takes risks without much thought about future consequences, it may suggest that thoughts about the future are not very salient determinants of the adolescent’s actions, perhaps because the adolescent places little value on the future. We summed scores on these six items to create a composite scale score of future expectations ranging from 10 to 30 (M = 21.72, SD = 2.98), with higher scores reflecting greater levels of hopefulness for one’s future. The internal consistency of the future expectations scale was modest (α = .44).

Depression. Adolescent depression was measured at wave 1 using a composite scale score including 10 items. Participants were asked how often in the past week they experienced feelings of sadness and depressive symptoms (e.g., “you were bothered by things that usually don’t bother you,” “your appetite was poor,” “you felt depressed”). Responses were coded on a scale of *never or rarely* (0) to *most of the time or all of the time* (3), and scores were summed to create a composite scale of total adolescent depression ranging from 0 to 30 (M = 6.08, SD = 4.28). The internal consistency of the depression scale was acceptable (α = .76).

Closeness to mother. A 3-item scale ascertained adolescents’ perceptions at wave 1 regarding their mothers’ displays of warmth and affection including “how close do you feel to your mother,” “how much do you think your mother cares about you,” (1 = *not at all* to 5 = *very*), and “you feel that you have a good relationship with your mother” (1 = *strongly agree* to 5 = *strongly disagree*, reversed). We summed participants’ responses on these three items to create an overall measure of one’s closeness with her mother ranging from 3 to 15 (M = 13.75, SD = 1.75), such that higher scores indicated a higher level of maternal closeness. The internal consistency of the maternal closeness scale was acceptable (α = .85).

Closeness to father. A three-item scale ascertaining adolescents’ perceptions regarding their fathers’ displays of warmth and affection at wave 1 including “how close do you feel to your father,” “how much do you think your father cares about you,” (1 = *not at all* to 5 = *very*) and “you feel that you have a good relationship with your father” (1 = *strongly agree* to 5 = *strongly disagree*, reversed). Those respondents who did not live with their resident father did not answer the questions about paternal closeness (n = 4547). Participants’ responses on these three items were summed, creating an overall measure of one’s closeness with his or her father ranging from 3 to 15 (M = 13.22, SD = 2.13), such that higher scores indicated a higher level of paternal closeness. The internal consistency of the paternal closeness scale was acceptable (α = .79).

Parental control. On this two-item measure, participants indicated whether they make their own decisions about their weekend curfews and whether they make their own decisions about which peer groups they spend time with. Adolescents answered either *no* (0) or *yes* (1), and responses were averaged to produce a parental control scale ranging from 0 to 1 (M = .58, SD = .31), such that lower scores indicated higher levels of parental control. The correlation between these two variables was relatively low (r = .14, p < .01).

Results

Preliminary Analyses

We first conducted a one-way analysis of variance (ANOVA) to determine whether there were differences in delinquency among adolescents identifying with different racial groups. There was a significant main effect of ethnicity on wave 2 delinquency F(4, 4800) = 5.35, p < .01. A Sheffé post hoc test indicated that Hispanic adolescents had significantly higher delinquency scores than both White and African American adolescents (p < .05). Table 2 shows the mean wave 2 delinquency scores for each ethnic group. All correlations among exposure to violence, delinquency, depression, future expectations, neighborhood satisfaction, and demographic covariates were significant except those between total household income and gender, and age and delinquency.
Factors Mediating the Relation Between Exposure to Violence and Adolescent Delinquency

We then performed a hierarchical ordinary least squares regression to test whether: (a) exposure to violence at wave 1 predicted adolescent delinquency at wave 2, and (b) future expectations, depression, and neighborhood satisfaction explained differences in adolescent delinquency. If these cognitive and environmental variables significantly predicted adolescent delinquency above and beyond the effects of exposure to violence, and if the effect of exposure to violence dropped to nonsignificance when these variables were included in the model, it would suggest that future expectations, depression, and neighborhood satisfaction together mediate the association between exposure to violence and adolescent delinquency. Results are presented in Table 3.

At the first step of the model, we entered demographic control variables, including biological sex, age, household income, and four dummy variables that compared Hispanic, African American, Asian, and “Other” ethnicities to White participants. Girls had significantly lower levels of delinquency than boys, older adolescents had significantly lower levels of delinquency than younger adolescents, and Hispanic adolescents had significantly higher delinquency scores than White adolescents.

At the next step, we entered delinquency at wave 1. Adolescents who engaged in high levels of delinquency at wave 1, also engaged in high levels of delinquency at wave 2.

We entered exposure to violence at the third step of the model. Exposure to violence exerted a signifi-

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### TABLE 2

**Mean Wave 2 Delinquency Scores for Racial/Ethnic Groups**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
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<td>White</td>
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<td>Hispanic</td>
<td>555</td>
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<td>1.81</td>
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<td>148</td>
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</tr>
<tr>
<td>Other</td>
<td>254</td>
<td>2.14</td>
<td>2.35</td>
</tr>
</tbody>
</table>

*Note. $R^2 = .02$ for Model 1 ($p < .01$); $R^2 = .29$ for Model 2 ($p < .01$); $R^2 = .01$ for Model 3 ($p < .01$); $R^2 = .02$ for Model 4 ($p < .01$) *$p < .05$; **$p < .01$.

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### TABLE 3

**Summary of Hierarchical Regression Analysis for Predicting Adolescent Delinquency at Wave 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
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<th></th>
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<td></td>
<td>B (SE)</td>
<td>$\beta$</td>
<td>B (SE)</td>
<td>$\beta$</td>
<td>B (SE)</td>
<td>$\beta$</td>
<td>B (SE)</td>
<td>$\beta$</td>
</tr>
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<td>-.09**</td>
<td>-.03 (.06)</td>
<td>-.01</td>
<td>-.03 (.06)</td>
<td>-.01</td>
<td>.03 (.06)</td>
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<tr>
<td>Age</td>
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<td>-.10 (.02)</td>
<td>-.07**</td>
<td>-.10 (.02)</td>
<td>-.07**</td>
<td>-.10 (.02)</td>
<td>.07**</td>
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<td>.00</td>
<td>.00 (.00)</td>
<td>.00</td>
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<td>.00 (.00)</td>
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<tr>
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<td>.05**</td>
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<td>.12 (.10)</td>
<td>.02</td>
<td>.09 (.10)</td>
<td>.01</td>
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<tr>
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<td>-.15 (.08)</td>
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<td>-.19 (.08)</td>
<td>-.03*</td>
<td>-.16 (.08)</td>
<td>-.03*</td>
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<tr>
<td>Ethnicity – Asian</td>
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<td>.09 (.20)</td>
<td>.01</td>
<td>.09 (.20)</td>
<td>.01</td>
<td>.08 (.20)</td>
<td>.01</td>
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<td>-.01 (.14)</td>
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<td>-.03 (.14)</td>
<td>-.00</td>
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</tr>
<tr>
<td>Delinquency at wave 1</td>
<td>.44 (.01)</td>
<td>.54**</td>
<td>.42 (.01)</td>
<td>.53**</td>
<td>.40 (.01)</td>
<td>.50**</td>
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<tr>
<td>Exposure to violence</td>
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<td>.04*</td>
<td>.20 (.08)</td>
<td>.04*</td>
<td></td>
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<td>-.13**</td>
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<td>.02</td>
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<tr>
<td>Depression at wave 1</td>
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<tr>
<td>Neighborhood satisfaction</td>
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<td>.01</td>
<td></td>
<td></td>
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</table>

|$R^2 = .02$ for Model 1 ($p < .01$); $R^2 = .29$ for Model 2 ($p < .01$); $R^2 = .01$ for Model 3 ($p < .01$); $R^2 = .02$ for Model 4 ($p < .01$) *$p < .05$; **$p < .01$.
cant unique effect on adolescent delinquency at wave 2 above and beyond the effects of previous delinquency levels. However, the effect of delinquency at wave 1 on delinquency at wave 2 remained significant. Thus, although exposure to violence had a unique effect on wave 2 delinquency, it did not mediate the relation between wave 1 and wave 2 delinquency.

Finally, we entered future expectations, depression, and neighborhood satisfaction at the fourth step in the model. Only future expectations had a significant effect on wave 2 delinquency. Contrary to our hypothesis, however, these three cognitive variables together did not explain the association between exposure to violence and adolescent delinquency. The effect of violence exposure on delinquency remained significant even after these factors were taken into account.

To address our hypothesis that parental closeness and monitoring moderates the relation between exposure to violence and delinquency, we conducted a correlation analysis to uncover initial relationships among the variables included in this model. This preliminary analysis yielded a high degree of significant correlation among the demographic control variables and potential moderating variables.

Factors Moderating the Relation Between Exposure to Violence and Adolescent Delinquency

To test whether parental closeness and monitoring moderated the effect of exposure to violence at wave 1 on delinquency at wave 2, we ran separate hierarchical ordinary least squares regression analyses to address the differential impact of maternal and paternal support. If the interaction terms significantly predicted adolescent delinquency, this would suggest that the moderators—closeness to mother or father and parental monitoring—had differential impacts on participants who experienced high levels of exposure to

<p>| TABLE 4 |</p>
<table>
<thead>
<tr>
<th>Summary of Hierarchical Regression Analysis for Predicting Adolescent Delinquency at Wave 2, Including Maternal Closeness Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>Biological sex</td>
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<tr>
<td>Age</td>
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<tr>
<td>Household income</td>
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<tr>
<td>Ethnicity - Hispanic</td>
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<td>Ethnicity – African American</td>
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<td>Ethnicity – Asian</td>
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<tr>
<td>Ethnicity – Other</td>
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<tr>
<td>Delinquency at wave 1</td>
</tr>
<tr>
<td>Exposure to violence</td>
</tr>
<tr>
<td>Closeness to mother</td>
</tr>
<tr>
<td>Parental control</td>
</tr>
<tr>
<td>Exposure to violence x closeness to mother</td>
</tr>
<tr>
<td>Exposure to violence x parental control</td>
</tr>
</tbody>
</table>

R² = .02 for Model 1 (p < .01); R² = .27 for Model 2 (p < .01); R² = .01 for Model 3 (p = .09); R² = .01 for Model 4 (p < .05); R² = .00 for Model 5 (p = .79)
*p<.05; **p<.01.
violence and those who experienced low levels. Consequently, these variables could be described as protective factors for high-risk adolescents if they had the greatest impact on participants who were most frequently exposed to violence.

The first moderational model was designed to determine the effects of maternal closeness on wave 2 delinquency and to test for moderating effects of the interaction between exposure to violence and closeness to mother and between exposure to violence and parental monitoring. The results are reported in Table 4.

At the first step, we estimated the effects of maternal closeness and parental monitoring on adolescent delinquency. Controlling for demographic covariates, wave 1 delinquency, and exposure to violence, closeness to mothers was predictive of lower levels of delinquency.

We entered the interaction terms between exposure and maternal closeness and exposure and parental control at the second step. Neither of these terms was significant.

Next, we conducted a hierarchical ordinary least squares regression to determine whether paternal closeness and monitoring predicted adolescent delinquency and whether parental closeness or parental control moderated the effect of exposure to violence on wave 2 delinquency. The results are reported in Table 5.

At the first step, we estimated the effects of paternal closeness and parental monitoring on adolescent delinquency. Controlling for demographic covariates, wave 1 delinquency, and exposure to violence, closeness to father significantly predicted lower levels of wave 2 delinquency.

We entered the interaction terms between exposure and paternal closeness and exposure and parental control at the second step. Neither of these terms was significant.

<table>
<thead>
<tr>
<th>Table 5</th>
</tr>
</thead>
</table>

**Summary of Hierarchical Regression Analysis for Predicting Adolescent Delinquency at Wave 2, Including Paternal Closeness Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
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<td>-0.07**</td>
<td>0.04 (.07)</td>
<td>0.01</td>
<td>0.05 (.07)</td>
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<tr>
<td>Age</td>
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<td>-0.06**</td>
<td>-0.11 (.02)</td>
<td>-0.08**</td>
<td>-0.11 (.02)</td>
</tr>
<tr>
<td>Household income</td>
<td>0.00 (.00)</td>
<td>0.02</td>
<td>0.00 (.00)</td>
<td>0.01</td>
<td>0.00 (.00)</td>
</tr>
<tr>
<td>Ethnicity - Hispanic</td>
<td>0.37 (.14)</td>
<td>0.05*</td>
<td>0.16 (.12)</td>
<td>0.02</td>
<td>0.13 (.12)</td>
</tr>
<tr>
<td>Ethnicity – African American</td>
<td>-0.08 (.13)</td>
<td>-0.01</td>
<td>-0.11 (.10)</td>
<td>-0.02</td>
<td>-0.14 (.11)</td>
</tr>
<tr>
<td>Ethnicity – Asian</td>
<td>0.28 (.25)</td>
<td>0.02</td>
<td>0.09 (.21)</td>
<td>0.01</td>
<td>0.09 (.21)</td>
</tr>
<tr>
<td>Ethnicity – Other</td>
<td>0.40 (.19)</td>
<td>0.04*</td>
<td>0.05 (.16)</td>
<td>0.01</td>
<td>0.03 (.16)</td>
</tr>
<tr>
<td>Delinquency at wave 1</td>
<td>0.46 (.01)</td>
<td>0.57**</td>
<td>0.45 (.01)</td>
<td>0.56**</td>
<td>0.44 (.01)</td>
</tr>
<tr>
<td>Exposure to violence</td>
<td>0.22 (.10)</td>
<td>0.04*</td>
<td>0.02 (.10)</td>
<td>0.04*</td>
<td>0.01 (.10)</td>
</tr>
<tr>
<td>Closeness to father</td>
<td>-0.05 (.02)</td>
<td>-0.04**</td>
<td>-0.04 (.02)</td>
<td>-0.04*</td>
<td>0.01 (.12)</td>
</tr>
<tr>
<td>Parental control</td>
<td>0.01 (.12)</td>
<td>0.00</td>
<td>0.02 (.13)</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Exposure to violence x closeness to father</td>
<td>0.01 (.12)</td>
<td>0.00</td>
<td>0.02 (.13)</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Exposure to violence x parental control</td>
<td>-0.05 (.04)</td>
<td>-0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>1.2%</td>
<td>32.8%</td>
<td>32.9%</td>
<td>33.1%</td>
<td>33.1%</td>
</tr>
</tbody>
</table>

Note. \( R² = .01 \) for Model 1 \( (p < .01) \); \( \Delta R² = .32 \) for Model 2 \( (p < .01) \); \( \Delta R² = .01 \) for Model 3 \( (p < .05) \); \( \Delta R² = .02 \) for Model 4 \( (p < .05) \); \( \Delta R² = .00 \) for Model 5 \( (p = .39) \).

*p < .05. **p < .01.
Discussion

The results of the present study support the wide range of findings that designate exposure to violence as a predictor of later adolescent aggression. Although negative cognitive responses to witnessing violence in high-risk, urban youth did not mediate the relation between exposure to violence and delinquency, adolescents’ expectations and levels of hopelessness for the future had a significant unique effect on behavioral outcomes, even when controlling for the highly stable construct of prior delinquency (DuRant, Cadenhead et al., 1994; Miller et al., 1999). Thus, although witnessing community violence and having low expectations for the future both predict adolescent delinquency, exposure to violence does not cause delinquency necessarily because it decreases adolescents’ hopefulness for the future; rather, it exerts its effects either directly or through a separate mediating factor. Additional findings from our study indicate that both maternal closeness and paternal closeness negatively predict adolescent delinquency, but parental monitoring and control does not. However, neither closeness to mother nor closeness to father moderated the relation between exposure to violence and delinquency. Thus, our findings suggest that a close relationship with one’s parents does protect adolescents from engaging in delinquency; however, for adolescents who witness a great deal of community violence, such a relationship does not fully overcome the risk of delinquency.

Our models each accounted for approximately one third of the variance in adolescent delinquency, offering a relatively strong description of the factors that predict delinquency. However, the majority of the variance was accounted for by prior levels of delinquency in all three models. These results suggest that even though adolescents’ relationships with their parents may protect them from future delinquency, they do not have the power to reverse the effects of earlier engagement in delinquency. Therefore, it is important that parents address children’s risks for aggression at an early age in order to prevent the cumulative effects of engaging in delinquency.

Notably, there were no significant differences in levels of delinquency between African American and White adolescents. Although it is contrary to the commonly held view that African American adolescents disproportionately commit delinquent acts, the results of previous studies validate this finding (MacDonald et al., 2005). In order to determine whether African American youth should be targeted as a particularly high-risk group for delinquency, future research must clarify the discrepancy in the literature regarding differences in levels of aggression between African American and White adolescents.

Several policy implications and potential pathways for intervention arise from the current results. Notably, increased attention should be paid to the father’s role in addition to the mother’s as a familial support figure. Although much of the research has focused solely on effects of maternal closeness, the present findings call for a substantial change in thinking about familial factors on adolescents’ behavioral outcomes. Specifically, fathers should provide social and emotional support for their children as well and foster close relationships to protect adolescents from delinquency, whether or not the child witnesses high levels of community violence.

Another intervention strategy for adolescents at risk for developing externalizing problems is to improve adolescents’ perceptions of life satisfaction through cognitive-behavioral or group therapy. Given that future expectations have a significant unique effect on children’s outcomes, altering these negative cognitions would diminish adolescents’ propensity toward engaging in violent and antisocial behaviors (MacDonald et al., 2005), if they are indeed extreme cognitive reactions to manageable life stressors. On the other hand, many adolescents with negative life perceptions face tremendous stressors daily in addition to chronic community violence, such as poverty, familial strain, academic pressures, and peer pressures, and thus their cognitive evaluation of future possibilities may be entirely within the normative range. In that case, the only policy implementation that will significantly raise levels of hopefulness for the future, thereby decreasing future delinquency, is a large-scale structural upheaval of social and economic systems (Bolland, 2003) as a means to reduce the many risks for children’s behavioral problems that are associated with poverty. Regardless, adolescents who display negative cognitions about their life situations and future aspirations must be cared for so that their future engagement in aggressive and violent behaviors can be avoided, thereby slowing the cycle of violence and reducing the likelihood that at-risk individuals will enter into a lifestyle of criminal behavior as adults.

Although the results of the present study indicate that adolescents’ future expectations affect delinquency beyond the influence of exposure to violence, it is unclear how these findings should be viewed. Perhaps adolescents, particularly individuals living in low-income and risky neighborhoods, simply do not care about their future and experience a sense of utter hopelessness. This in turn may lead them to engage in
risky behaviors because they feel it is not worth the effort to protect themselves and others in the face of such bleak futures. On the other hand, it may be the case that these adolescents simply underestimate the consequences of their risk behavior due to chronic exposure to violence, poverty, and other negative life events. Adolescents may effectively become desensitized to the grim conditions of their surroundings so that engagement in delinquent acts no longer appears risky, but rather normative (Gorman-Smith & Tolan, 1998). One additional framework for understanding the link between adolescent’s perceptions of the future and delinquency is rooted in Bandura’s (1973) Social Learning Theory, which posits that youths recognize the risk in their behaviors, but because they have acquired an understanding of their neighborhoods as graveyards for long-term success, they engage in behaviors that may be immediately gratifying, yet detrimental in the long-run (Anderson, 1999; Bolland et al., 2001; Lorion & Saltzman, 1993). Future research should focus on disentangling these theoretical perspectives in order to clearly identify how adolescents’ negative cognitions are linked to delinquency.

Several limitations to the research methods employed in the present study should be addressed in future research. First, in contrast to Berman et al. (1996) and other previous studies, the present measure of exposure to violence did not include indications of witnesses’ proximity to the violent acts (Farrell & Bruce, 1997; Gorman-Smith & Tolan, 2003), frequency, recency, relationship of witness to the victim (Gorman-Smith & Tolan, 2003), and the context in which violence was witnessed (Richters & Martinez, 1993). Martinez and Richters (1993) showed that the victimization of known persons causes depression in the witness; thus, a more comprehensive measure of violence exposure would provide for a more detailed analysis regarding exactly which types of violence produce negative effects in bystanders.

Second, the exposure to violence variable measured participants’ witnessing of only two violent acts, whereas many researchers have combined multiple forms of violence exposure (Berman et al., 1996; Gorman-Smith & Tolan, 1998), including exposure to violence via word of mouth through friends and family members (Gorman-Smith & Tolan, 2003) and hearing nearby gunshots (Miller et al., 1999). While the specific indicator of violence exposure used in this study modeled after the measure used by Schwab-Stone and colleagues (1995) provides a conservative estimate of the effect of exposure on delinquency, future studies would benefit from exploring all types of violent acts.

Third, the measure of exposure to violence did not include a measure of victimization. Although some researchers may view this as an efficient means of controlling for the differential outcomes of two separate constructs of witnessing and victimization (Fitzpatrick, 1993), Schwartz and Proctor (2000) have found that victimization often overlaps with witnessing violent acts, so both constructs should be accounted for when evaluating exposed children’s risks of engaging in future delinquency (Bell & Jenkins, 1993).

Fourth, all of our findings rely solely on self-report data. Though the validity of self-report measures is likely more robust for older adolescents as compared to younger children who may confuse media representations of violence and dreams with life occurrences (DuRant, Cadenhead et al., 1994; Schwartz & Proctor, 2000), participants may not have responded truthfully in an effort either to conceal information or exaggerate their plights.

Finally, our measure of future expectations encompasses a potentially confounding factor. As Bolland and colleagues (2001) suggest, adolescents’ uncertainty about the future and their levels of hopelessness about the future may not reflect the same cognitive and affective processes, though our measure does not differentiate between the two. For example, although adolescents were asked to rate “how certain” they were that they would live to age 35, they may have responded entirely differently had the question been phrased “how much do you care whether you live to age 35?” This discrepancy highlights the need for the future expectations variable to isolate future uncertainty and future hopelessness, as they may reflect entirely different constructs. Additionally, the future expectations scale includes adolescents’ reports of risk-taking behaviors. Although these measures were included in the scale to obtain a concrete measure of how much adolescents are willing to risk when future consequences are at stake, they may alternatively reflect an entirely different construct from future expectations, as suggested by the relatively low internal consistency. For example, it is conceivable that an adolescent who has quite high expectations for the future actually takes part in high levels of risk-taking behaviors because he has a positive outlook on the future and feels confident in his ability to overcome the consequences of his behavior. Despite these limitations, the current study contributes to the literature on the effect of exposure to violence on adolescent delinquency, and highlights the need for future research to examine potential mechanisms through which these effects occur.
References


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Copyright 2007 by Psi Chi, The National Honor Society in Psychology (Vol. 12, No. 2, 59-69 / ISSN 1089-4136).
Carrying books is a daily activity that crosses sex, ethnic and national boundaries, which makes it a useful topic through which to examine behavioral differences found in human beings. It has been over 10 years since the last published research on book carrying patterns appeared (McKelvie, 1993). Because of this gap, one primary motivation of this study was to update important past findings in order to identify possible changes in carrying behavior that may have happened due to social changes over time. It is possible that these changes may reflect shifts in gender roles that have occurred. In our first study, we expanded research in this area by examining the relationship between book carrying styles, gender, and body shape. In our second study, we examined cultural and psychological factors that could influence behavior, such as acculturation, self-esteem, and gender identification.

Jenni and Jenni (1976) pioneered the research on book carrying behavior. They observed people in all age groups, from children to adults over the course of 6 years and found that women carried books closer to their body (Type II, see bottom row of Figure 1), whereas men carried books at their side (Type I, see top row of Figure 1). They also found that these sex differences were present in countries other than the United States (Costa Rica and El Salvador). In the same year, Hanaway and Burghardt (1976) examined age and sex differences in book carrying behavior. They proposed that body size and physical strength might account for differences in carrying behaviors. However, neither variable made a statistically significant difference.

Because book weight was not considered in Hanaway and Burghardt’s (1976) study, Spottswood...
and Burghardt (1976) examined the interaction between handgrip and weight of books. Again, neither of these variables accounted for the sexually dimorphic behaviors observed. Although men had stronger handgrips than women, both men and women carried similar book loads. Carrying behavior was not significantly altered because the weights examined were manageable for both men and women despite potential discrepancies in handgrip. They concluded that the carrying style chosen by the participants was due only to preference.

More recently, McKelvie (1993) replicated Jenni and Jenni’s (1976) study to see if the number of women who used styles that have been most associated with men (e.g., Type I) would increase. Observing undergraduate students, McKelvie showed that women continued to use Type II carrying styles (53%), but not to the extent found by Jenni and Jenni’s work (82%). Thus, it is possible that book carrying behavior has continued to change during the time since this work was completed.

**FIGURE 1**

In the typical male carrying positions know as Type I (Styles 1-3) the book weight is mainly supported by the handgrip, with the body used to steady the book. Styles typically carried by women, Type II (Styles 4-6) use the hip, waist, and pelvic area to support the book load, and use their hands to steady them.

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Because grip strength and book weight have been ruled out as contributing factors to sexually dimorphic book carrying methods, we examined the influence of body shape (i.e., height and weight) on this behavior. In this study, the definition of “book” includes only large (approximately 8 by 11 inches), heavy books such as textbooks. In the first (observational) experiment, we noted the book carrying styles and body shapes of 500 men and women at a large university. We hypothesized that women would favor Type II carrying styles, whereas men would favor Type I carrying styles. We were also interested in any possible changes in book carrying styles that have occurred since the last research was conducted in 1993 by McKelvie, hypothesizing that more women would use the traditionally masculine Type I carrying styles. Klaczynski, Goold, and Mudry (2004) found that self-esteem and negative attitudes toward obesity are negatively correlated. They found that women are more likely than men to believe they do not have control over their weight, and women internalize cultural messages regarding the importance of thinness to personal success more than men. We thought that larger women would be more sensitive to how their body shape is negatively viewed by society at large, and would clutch their books closer to their body in an unconscious display of self-protection. Thus, we hypothesized that petite women would prefer Type I carrying styles over Type II, while full-figured women would prefer Type II carrying styles.

**Experiment 1**

**Method**

**Participants.** Five hundred students attending California State University, Long Beach (CSULB) were observed. CSULB’s overall gender breakdown in 2003 was 60.6% women and 39.4% men (California State University, Long Beach, Institutional Research, 2003). We over-sampled men to achieve a balance of 50% men and women (n = 250 each). The age of the students observed was estimated to be 18 and over. All participants were observed over a 2-month period during the Spring 2004 semester.

**Materials and procedure.** This naturalistic observation was conducted using Spottswood and Burghart’s (1976) coding design (see Figure 1). Six distinct book-carrying styles were identified. Both men and women were categorized using one of these six styles. To further simplify these six styles, Styles 1-3 have been referred to as Type I and Styles 4-6 have been referred to as Type II. To judge body shape, Stunkard, Sorensen, and Schulzinger’s (1983) code chart was used. This scale described pictorially seven different body types for each sex, ranging in size from a thin, extremely...
underweight body shape (body type A) to a large, obese body shape (body type G).

Two female observers sat on benches and viewed students at four separate highly populated locations on campus, including a library, two courtyards, and a bookstore. Participants were watched as unobtrusively as possible, with the observers wearing sunglasses in attempts to conceal their examinations from participants. Inter-rater reliability was calculated between the two female observers during a pilot study before data collection and once weekly during collecting periods. The reliability, calculated as percent agreement, was never below 90% for classification of sex, body shape, and book carrying style. When a participant was identified carrying a book in a specific style, the participant was first identified as a man or woman, then body shape was determined using the code chart developed by Stunkard et al. (1983), and finally the participant’s book carrying style was classified according to Spottswood and Burghardt's (1976) code chart. If a person changed the way he or she carried a book at any point while being observed, the researchers recorded only the first carrying style the student displayed, but such changes were very infrequent.

**Results**

Overall, Type I was the modal carrying style used by both men and women (n = 316). The male students more frequently used carrying styles 1, 2 and 3 (see Table 1) whereas the women in the study more frequently used carrying styles 4, and 5. No students used style 6. This difference across the six styles was statistically significant, $\chi^2 (5) = 264.62, p < .05$. Women used Type II carrying styles 72% of the time (n = 179) and Type I only 28% of the time (see Table 2). The men used Type I carrying styles 98% of the time (n = 245) and Type II only 2% of the time. When comparing the general Type I and Type II carrying behaviors, a significant difference was found between men and women, $\chi^2 (1) = 260.35, p < .05$. To example possible changes over time, we compared the Type I and II results found by Jenni and Jenni (1976) and McKelvie (1993) with the results from the present study (see Table 2). We found a significant difference in women’s carrying styles over time, $\chi^2 (2) = 20.29, p < .05$; yet no significant difference in men’s carrying styles, $\chi^2 (2) = 5.47, p < .05$. In each of these three studies, men consistently used the Type I carrying style over 90% of the time, yet women’s carrying behavior was less consistent. Women preferred Type II in each of the studies, but the degree of the preference fluxed from 82% in 1976 (Jenni & Jenni), to 53% in 1993 (McKelvie), and to 71% in 2004.

The body shapes of women and men were observed using Stunkard et al.’s (1983) code chart on a scale of A to G. Women of all body shapes used Type II more, and men of all body shapes used Type I more often. Body type C, a moderately slender body size was the modal shape observed for both men and women. Body shape did not have a significant effect on female $\chi^2 (6) = 7.72, p > .05$ or male $\chi^2 (6) = 10.63, p > .05$ students’ use of either Type I or Type II carrying styles.

**Discussion**

Overall, women used Type II carrying styles more frequently than men, whereas men used Type I carrying styles more often. This finding supported our main hypothesis. Although there have been changes in many societal norms that have occurred since Jenni

---

**TABLE 1**

<table>
<thead>
<tr>
<th>Style</th>
<th>Men (n = 250)</th>
<th>Women (n = 250)</th>
<th>Total (N = 500)</th>
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</tr>
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</tr>
<tr>
<td>2</td>
<td>25</td>
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</tr>
<tr>
<td>3</td>
<td>31</td>
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<td>43</td>
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<tr>
<td>Type II</td>
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<tr>
<td>4</td>
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**TABLE 2**

<table>
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<tr>
<th>Study</th>
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<tbody>
<tr>
<td>Jenni &amp; Jenni (1976)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>96%</td>
<td>4%</td>
<td>100%</td>
</tr>
<tr>
<td>Women</td>
<td>18%</td>
<td>82%</td>
<td>100%</td>
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<tr>
<td>McKelvie (1993)</td>
<td></td>
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<tr>
<td>Men</td>
<td>91%</td>
<td>9%</td>
<td>100%</td>
</tr>
<tr>
<td>Women</td>
<td>47%</td>
<td>53%</td>
<td>100%</td>
</tr>
<tr>
<td>Present Study (2004)</td>
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<td></td>
</tr>
<tr>
<td>Men</td>
<td>98% (245)</td>
<td>02% (5)</td>
<td>100% (250)</td>
</tr>
<tr>
<td>Women</td>
<td>28% (71)</td>
<td>71% (179)</td>
<td>100% (250)</td>
</tr>
</tbody>
</table>
and Jenni’s (1976) work, particularly in male/female gender roles, this study demonstrates that book-carrying behaviors have not changed drastically over the past 10 years. We did not find that more women are using the traditionally male typical Type I carrying styles, as hypothesized. In fact, we found an increase in the number of women carrying in the female-typical Type I style, results which more closely align with Jenni and Jenni’s findings than those obtained by McKelvie (1993). Women were observed using Type II carrying styles 82% of the time by Jenni and Jenni, 53% of the time by McKelvie, and 72% of the time in the present study. Our hypothesis that body shape would have a significant effect on book carrying behavior, specifically that slender women would prefer Type I carrying styles, was not supported.

This discrepancy between our findings and McKelvie’s (1993) might be due in part to our operational definition of a “book” as a large textbook approximately 8 by 11 inches, whereas McKelvie included materials like novels, notebooks, and binders. Although the inter-rater reliability for both observers was high, one threat to internal validity may have been expectancy, because the experimenters also served as observers. As experimenters, we had certain expectations about how participants would act, which could have influenced how we categorized book carrying styles and/or the body shape of a participant. Expectancy was controlled in the second experiment because the experimenters did not make subjective observations or judgments. Instead, participants determined their comfort level for each of the six carrying styles and responded accordingly.

**Experiment 2**

In another article examining previous research, Jenni (1976) suggested that sex differences in book carrying behavior may be due to social pressures and rigid gender roles. According to the evolutionary theory of gender differences, genes that were selected by evolutionary pressures on ancestral women and men caused gender differences (Geary, 1998). Research conducted on gender differences have demonstrated that men score higher on measures of general physical self-concept that do women (Kломстен, Сkaалвик, & Espnes, 2004; Marsh, 1989). One area of behavior that has many established sex differences is physical movement and body gestures. For example, limp wrist, arm flutter, flexed elbow, handclasp, and palming are seen as feminine gestures (Reckers & Rudy, 1978). Accordingly, it is not a stretch to suggest that certain book carrying behaviors are viewed as inherently feminine or masculine.

The notion that people have a strong need for self-esteem plays a central role in theories of human social behavior. An individual’s physical body is one of many influences on self-esteem. Dissatisfaction with the body is associated with low self-esteem among men and women alike (Cash, Winstead, & Janda, 1986; McCaulay, Mintz, & Glenn, 1988). Conversely, satisfaction with one’s body is associated with happiness (Berscheid, Walster, & Bohte, 1973). Research conducted by Goldenberg, McCoy, Pyszczynski, Greenberg, and Solomon (2000) found that participants with high esteem identified higher with their bodies than those with low esteem.

In Experiment 2 of the present study, we set out to further examine the influence of self-esteem, gender identification, and acculturation on book carrying. The effects of self-esteem and gender identification on book carrying behavior have not previously been examined. Our main hypothesis was that participants with feminine gender identification would prefer carrying books in the Type II styles, and that participants who were classified as having a masculine gender identification would prefer Type I carrying styles, regardless of their sex. Jenni and Jenni (1976) studied the possible mitigating effects that culture may have on this behavior, but they only included participants from three countries (Costa Rica, El Salvador, and the United States). We tried to identify any culture effects by measuring participant’s level of identification with any culture outside of the United States.

**Method**

**Participants.** Experiment 2 was performed using 32 men and 68 women enrolled at California State University, Long Beach. The age of the participants ranged from 18 to 50 years ($M = 20.86, SD = 4.91$). The ethnic breakdown of participants was 9% Asian/Pacific Islander; 6% Black, non-Hispanic; 35% Hispanic; 37% White, non-Hispanic; 7% Multiracial; and 6% of another racial origin.

**Materials and procedure.** Upon arrival, participants provided informed consent and received general instructions. All participants completed an identical series of tests and questionnaires. The first test that participants received was the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a measure of global self-esteem. Participants read 10 statements, (e.g., “I wish I could have more respect for myself”) and ranked how each statement pertained to their feelings about themselves, from strongly agree to strongly disagree. The Rosenberg scale has high reliability; with a Cronbach’s alpha of .74 (McCarthy & Hoge, 1983). Next, the Bem Sex-Role Inventory (1975) was administered, which is a 60-question test that classifies participants accord-
ing to gender role identification. Gender role identification is divided into four groups: feminine, masculine, androgynous, and undifferentiated. Participants ranked how much they felt each statement described themselves on a Likert scale from 1 to 7, with 1 being Never or almost never true of me and 7 being Always or almost always true of me. The Bem Inventory includes statements such as “Eager to soothe hurt feelings” and “Aggressive” and has a high reliability, Masculinity coefficient alpha = .86; Femininity coefficient alpha = .82 (Holt & Ellis, 1998).

After these two questionnaires, participants were presented with photographs of a college-aged man or a college-aged woman carrying a textbook in each of the six carrying styles. Women were shown the female model whereas men were shown the male model. The photos depicted Asian American students, the modal minority group at CSULB (California State University, Long Beach, Institutional Research, 2003). Participants were asked to rank the six carrying styles on a scale of 1 through 6—marking 6 for their most preferred and 1 for their least preferred style. We determined participant’s preferred carrying type (I or II) by noting their top ranked carrying style (from 1 to 6) and classifying them accordingly. For instance, if a participant ranked style 1, 2, or 3 as their most preferred carrying style, we classified them as preferring the Type I carrying style. Next, they indicated their perceived comfort level when carrying books in the six carrying styles by giving each carrying style a numerical score on a Likert scale from 1 to 5. The most comfortable carrying style corresponded with the number 5, and the least comfortable carrying style corresponded with the number 1.

Finally, participants filled out a demographic questionnaire, which asked for their native language as well as their degree of identification with a culture other than that of the United States, from 0 to 100%. A 0% score would indicate the participant identified only with American culture, 50% would indicate the participant identified half with American culture and half with another, while 100% would indicate identification only with another culture. Participants also filled in a description of other cultures they identified with, if any.

**Results**

Students’ preferred style of book carrying varied according to their score on the Ben Sex Role Inventory, as hypothesized (see Figure 2). For Type II scores, a significant effect of sex role was observed using a 2 (carrying type) x 4 (gender identity) ANOVA, $F(3, 96) = 3.45$, $p < 0.5$. Tukey’s post-hoc test confirmed that students with feminine gender identification scores preferred Type II carrying styles more than participants with masculine gender identification scores. No significant effect was observed for Type I scores, although a nonsignificant trend in the expected direction emerged (see Figure 2). In regard to perceived comfort, using a paired-sample t test, men rated Type I ($M = 3.76, SD = .54$) significantly higher than Type II ($M = 2.20, SD = .75$), $t(31) = 9.85, p < 0.5$; whereas women rated Type II ($M = 3.23, SD = .50$) significantly higher than Type I ($M = 2.92, SD = .66$), $t(67) = -2.95, p < 0.5$.

Self-esteem was not significantly correlated with preferred carrying Type I ($r = .11, p > 0.5$) or Type II ($r = -.12, p > 0.5$). This finding may be due in part to the lack of variability in scores ($M = 33.4, SD = .43$). However, it is interesting to note that Type I preference resulted in a positive correlation with self-esteem, whereas Type II preference resulted in a negative correlation with self-esteem, but neither of these correlations were significant. Our participants identified highly with the American culture more than they identified with any other ($M = 34.35, SD = 25.49$). This may explain somewhat why the participants’ self-reported degree of acculturation did not have a significant correlation with book carrying behavior for either Type I ($r = -.04, p > 0.5$) or Type II ($r = .09, p > 0.5$).

**FIGURE 2**

Mean preference for Types I and II by score on the Bem Sex Role Inventory, using the Hybrid Method for classifying individuals. No participant identified Style 6 as their most preferred book carrying style, so Style 6 was omitted from the scale.
Discussion

The present study confirmed past research, that men and women carry their books in a significantly different manner. Further, we found that body shape, self-esteem, and acculturation were not significant factors on book carrying preference. In the second experiment, it was found that gender identification and perceived physical comfort significantly affected the way a man or woman chose to carry his or her books.

Results concerning self-esteem and acculturation should be examined in greater depth in the future with a more diverse participant group. Because participants from the second experiment reported such a high mean self-esteem score (M=3.34, SD=.43, on a scale of 1 to 4), one suspects that the students wanted to present themselves in a favorable light. It might be helpful in the future to use a more effective measure of self-esteem with more detailed questions. To further examine the influence of acculturation on carrying behavior, it would be beneficial to have many participants who identify to a high degree with a culture outside the United States. In this study, we did not have many participants who identified over 50% with another culture. Also, it may be beneficial to study book carrying behavior in a broad range of countries that are less influenced by Western culture to achieve a better understanding of how this gendered behavior may be mitigated by culture. Finally, the order of the questionnaires was not counterbalanced, which could lead to potential order effects and is a limitation to our results.

During their studies on book carrying behavior for all school-age subjects, Jenni and Jenni (1976) and Hanaway and Burghardt (1976) found that women changed their carrying styles over time, specifically during puberty, whereas male carrying behavior remained constant regardless of type. Thommen, Reith and Steffen (1993) questioned what caused women to make this change in their carrying behavior when men are not affected. In the future, another topic to be explored is why women’s carrying style changes in conjunction with puberty, a time of great physical, emotional as well as social change and growth in both sexes. Perhaps the development of stronger social expectations for the two sexes leads girls to conform to more “gender appropriate” behaviors, including book carrying behavior.

Book carrying is such a ubiquitous act that goes largely unnoticed, yet conveys much about gender and social norms. We know that men and women differ in their preferred book carrying styles, yet the reason is still unknown. It is important to continue to eliminate those variables that do not contribute to this difference, to best understand the behavior itself. The true reasons for the various distinctions between the sexes may be established once we demystify the divergent behaviors.

References

Hispanics are one of the largest and fastest growing populations in the U.S (U.S. Census Bureau, 2001). The word “Hispanic” refers to individuals of Latin American descent (including Mexicans, Puerto Ricans, and Cubans, as well as other ethnic groups originating from Central and South America) and has been used interchangeably with the term “Latino.” In 2003, Hispanics represented approximately 13% of the total U.S. population and are projected to double in percentage by the year 2050. The dramatic growth of the Hispanic population between the years 1990 to 2000 has resulted in sociodemographic changes and yielded much attention from researchers and policy makers. Studies examining these changes have highlighted the composition of the Latino population, underscoring that Mexican Americans constitute the largest Hispanic subgroup (58%) and that Hispanics in general, are younger compared to the rest of the U.S. population (Marotta & Garcia, 2003). Changes in this population have also included shifts in the trend of ethnic self-identification, with a significant growth of individuals identifying with pan-ethnic labels (e.g., Hispanic/Latino) than with national labels (e.g., Mexican, Puerto Rican, Cuban; Guzmán and McConnell, 2002). Ethnic identity plays an important role in the development of self-concept among adolescents and emerging adults. Given that ethnic labels are considered to be one aspect of ethnic identity, it is important to better understand the relevance of ethnic labels among Mexican origin youth in the U.S.

By definition, ethnic identity entails an individual’s sense of self as a member of an ethnic group (Liebkind, 2001), and it encompasses three dimensions. The first is ethnic self-identification and this encompasses the group affiliation label that one adopts. The second consists of feelings of affirmation and belonging that entails having shared values and attitudes with fellow ethnic group members as well as feelings of pride and commitment toward an ethnic group.
The third aspect involves exploration of issues related to ethnicity and ethnic identity development (e.g., seeking out customs and traditions that are specific to an ethnic group; Roberts, Phinney, Masse, Chen, & Roberts, 1999). Together, affirmation and exploration constitute the subjective dimensions of ethnic identity and are considered to be distinct from ethnic self-identification, which has been characterized separately as a demographic marker of ethnic identity (Phinney, 2003).

Ethnic identity has been conceptualized through several theoretical frameworks (e.g., Umaña-Taylor, Diversi, & Fine, 2002). In particular, two central perspectives have been critical in the conceptualization of ethnic identity. Social identity (SIT) and ego identity theories serve as the foundation for affirmation and exploration, respectively. According to Tajfel and Turner (1979), social identity theory (SIT) posits that by being a member of a group, individuals gain a sense of belongingness that contributes to a positive and healthy self-concept. Specifically, SIT encompasses an individual’s perception of being a member of a social group as well as the emotional attachment and value placed on being part of that group. In the case of group membership, belongingness to an ethnic group constitutes one form of group identity (Tajfel, 1978). Particularly for ethnic minority youth, understanding and learning about one’s ethnicity is particularly relevant during the adolescent years (Phinney, 1989). In turn, they will evaluate the significance and legitimacy of their group either by having positive feelings of belongingness or experiencing negative feelings of insecurity or resentment towards their group (Brown, 2000; Tajfel & Turner, 1986). Ethnic identity is therefore an extension of the conceptual framework of SIT, because feelings of affirmation are central to one’s endorsement of a specific ethnic group.

According to ego identity theory, Erikson (1968) argued that individuals attain an achieved identity only after having explored, committed, and overcome the challenges of making decisions in various domains (e.g., ideology, occupation, and lifestyle). In line with ego identity theory, the stages of ethnic identity development progress from an unexamined phase (through a period of identity exploration regarding group membership and the meanings and implications associated with it) to an achieved identity, which is the secure feeling of being a member of an ethnic group (Phinney, 1989). This process of identity development is especially relevant for youth because adolescence is a critical time in which individuals begin to explore their sense of identity and who they are. Scholars have highlighted the significance of the transitional time period between adolescence and adulthood and have termed it “emerging adulthood” (Arnett, 2006). Ethnic identity development is therefore especially relevant for the college-aged population, as evident in the process of ethnic identity exploration and commitment. Altogether, the affirmation dimension of ethnic identity builds on the conceptual theory of SIT, while the exploration dimension parallels the framework of ego identity formation.

As previously discussed, ethnic labels are the group labels that individuals identify, and can shed light on one’s identification to a particular ethnic group within a host society. Due to the heterogeneity of ethnic self-labels, Phinney (2003) formulated a classification system based on three categories: (a) national labels (e.g., Mexican) which characterize the country of origin; (b) pan-ethnic labels (e.g., Hispanic/Latino), which refer to “national or ethnic groups that share a common language, a common culture, or a common regional origin into an encompassing identity” (Itzigsohn & Dore-Cabral, 2000, p. 226); and (c) compound labels (e.g., Mexican American), which are the labels that immigrant groups tend to use as they evolve from using a national label to one that incorporates their identification with the host country. In a review of the research on ethnic identity and acculturation, Phinney (2003) noted the relevance of ethnic self-labels in revealing cultural changes among ethnic minority populations. That is, she cited research (e.g., Berry & Sam, 1997) which showed that changes in ethnic self-identification are linked to changes in acculturation attitudes. Thus, ethnic labels may play a relevant role in revealing aspects of one’s acculturation status and related psychological processes.

The term ethnic identity has been used synonymously with the term acculturation even though both are separate constructs that are linked to the changes that ethnic minority members experience. Phinney (1990), in her review of the research on ethnic identity, noted acculturation as a concept that applies largely to group changes as opposed to individual responses. Acculturation has been defined as the process of psychological and behavioral adaptation that occurs when two cultures come into contact – as happens when immigrants arrive in a new country or one group is colonized by another (Berry, 1994). Acculturation is multidimensional and has been assessed through demographic (e.g., self-identification), behavioral (e.g., language use), and attitudinal (e.g., values toward mainstream society) indicators. Language use and generational status are two of the most frequently-used proxy measures of acculturation. Research has shown that more linguistically acculturated Mexican American college students (more English use) tended to report lower levels of ethnic
identity than their less acculturated counterparts (Cuéllar, Nyberg, Maldonado, & Roberts, 1997). Research has also found that over time, early-generation individuals tended to identify with national labels while later-generation children tended to adopt pan-ethnic (e.g., Latino/Hispanic) and compound labels (e.g., Mexican American; Rumbaut, 1994). Altogether, these two lines of research document the link between acculturation (as assessed by language use and generation status) and ethnic identity. Given that ethnic self-labels comprise one dimension of ethnic identity, it is conceivable that individuals who identify more strongly with their country of origin (“Mexican”) are likely to report lower levels of linguistic acculturation compared to their “Mexican-American” and “Latino/Hispanic” counterparts.

Although acculturation occurs at the group level, individuals experience the process in different ways, with some finding it more challenging than others. Acculturative stress is the ‘hang-over’ effect that has its source in and results from the acculturation process (Berry, 2000). Roysircar-Sodowsky and Maestas (2000) noted the protective role of ethnic identity against acculturative stress and described acculturation and ethnic identity as a “push-and-pull phenomena” such that individuals may feel the push to acculturate to the majority society and also the pull towards one’s ethnic group (p. 134). In addition, researchers have hypothesized the potential link between ethnic identification and acculturation (Sánchez & Fernández, 1993). Given what is known about acculturation, acculturative stress, and ethnic identity, it is possible that certain types of ethnic labels may reflect different levels of stress associated with the adaptation experience. Based on their strong identification with their country of origin, it is likely that individuals endorsing the “Mexican” label would experience higher levels of acculturative stress compared to their “Mexican American” and “Latino/Hispanic” counterparts who are likely to have compromised their self-identification to the host country.

Research on ethnic identity and adolescents has focused primarily on self-esteem as a marker of positive psychological well-being (e.g., Phinney, 1991). Among ethnic minority groups, research has consistently found positive associations between ethnic identity and self-esteem (e.g., Phinney, Cantu, & Kurtz, 1997). In a longitudinal study examining the relation between ethnic identity and self-esteem among ethnic minority youth, ethnic identity development was positively associated with self-esteem over time; furthermore, they mutually predicted one another over a three-year period (Phinney & Chavira, 1992). In another study, researchers found that self-esteem was related positively with ethnic identity, particularly for ethnic minority (Mexican American) college students who engaged in ethnic identity search and commitment (Phinney & Alipuria, 1990). Therefore, the association between ethnic identity and self-esteem may be particularly salient for ethnic minority youth who are highly ethnically identified. Given that self-identification with one’s country of origin may reflect a stronger connection to one’s native background, it is conceivable that individuals identifying as “Mexican” will derive higher levels of self-esteem from their ethnic minority status compared to their pan-ethnic and compound-label counterparts.

Study Aim and Hypotheses

The goal of the current study was to examine ethnic self-labels and their relevance to the acculturation status and related psychological processes among Mexican origin college students. This investigation builds on prior research and addresses conceptual as well as methodological limitations. Despite the recent increase in ethnic identity research, there is limited work examining ethnic labels with acculturation. Furthermore, previous studies on ethnic identity with late adolescents/emerging adults have been limited to the subjective components of ethnic identity (affiliation and exploration) and only used ethnic self-labels as demographic markers for participant-selection. Thus, research in this field has overlooked an important aspect of ethnic identity that reflects individuals’ perceptions of themselves within the larger society. This paper contributes to the literature by acknowledging ethnic self-labels as important to our understanding of ethnic minority youth identity. Therefore, the primary aim of this study was to investigate the associations between ethnic self-labels and the acculturation status and related psychological processes of Mexican-origin young adults.

Based on the reviewed literature on ethnic identity, it was hypothesized that differences in acculturation status and related psychological processes would emerge across the three ethnic label typologies. Based on prior empirical and theoretical work on the subjective dimensions of ethnic identity, we anticipated individuals self-identifying with their country of origin (“Mexican”) to experience high levels of self-esteem. We also expected individuals endorsing the “Mexican” label to report lower levels of acculturation compared to their less Mexico-oriented compound (“Mexican-American”) and pan-ethnic (“Hispanics/Latinos”) label peers, and also experience greater levels of acculturative stress associated with the cultural adaptation.
Method

Sample Selection Procedures and Participants

Participants were part of a larger study ($N = 601$) on young adults’ psychological and social adjustment; data were derived from three state universities (two from the West coast and one from the Southwest region of the United States). Respondents were college students enrolled in psychology courses who received course credit for their voluntary participation. Participants completed a self-report questionnaire in small groups. They received an informed consent followed by a debriefing form. The Institutional Review Board at the colleges where this study was conducted approved the procedures of this investigation.

Given the current study, we focused on participants who self-identified as “Mexican” and/or reported that at least one parent was born in Mexico. Respondents were also restricted to emerging adults between the ages of 18-30 years old ($N$s ranged from 153-160; $M$ age = 23.0; 66% women).

Measures

Respondents completed a questionnaire that included demographic information and standardized scales. The demographic information included age, gender, birthplace, and parent education level.

Ethnic self-identification. Based on participants’ responses on the open-ended question, “In terms of ethnic group, I consider myself to be ____” on the MEIM (Multi-group Ethnic Identity Measure; Roberts et al., 1999), we categorized them according to Phinney’s (2003) classification typologies: national (12%), pan-ethnic (29%), and compound (59%) label groups.

Ethnic identity. We also used the MEIM (Roberts, et al., 1999) to assess the subjective and dimension of ethnic identity. The MEIM consists of two subjective subscales: ethnic affirmation and belonging (5 items; e.g., I am happy that I am a member of the group I belong to) and ethnic exploration (7 items; I have spent time trying to find out more about my own ethnic group, such as its history, traditions, and customs). Participants rated their level of agreement on a 4-point Likert scale (1 = Strongly disagree to 4 = Strongly agree). We averaged a combined ethnic identity score across all 12 items. Higher scores indicated higher levels of ethnic identity.

Linguistic acculturation. We used the shortened youth version of the Short Acculturation Scale for Hispanics (Barona & Millar, 1994). Participants responded to 13 questions regarding their language use (e.g., speaking, listening, thinking, and watching T.V.) on a 5-point Likert scale (1 = Native language only to 5 = English only). We summed and averaged across all items to derive an overall acculturation score. Higher scores indicated higher levels of linguistic acculturation.

Acculturative stress. We assessed acculturative stress using the Social, Attitudinal, Familial, and

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<td>National</td>
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Note. $N$s range from 152-160 due to missing cases.
Environmental acculturative stress scale (SAFE; Mena, Padilla, & Maldonado, 1987). Participants indicated the extent to which they felt bothered on 24 statements (e.g., I feel uncomfortable when others make jokes about or put down people of my ethnic background; It bothers me that I have an accent) using a 5-point Likert scale (1 = Not stressful to 5 = Very stressful). We calculated a mean score with higher scores indicating higher levels of acculturative stress.

**Self-esteem.** We used the Rosenberg Self-Esteem Scale (Rosenburg, 1965) to measure participants’ positive orientations toward themselves. Respondents indicated their responses on a 4-point Likert scale (1 = Strongly disagree to 4 = Strongly agree) on 10 statements (e.g., I feel that I have a number of good qualities; I take a positive attitude toward myself). We summed and averaged across all items and higher scores indicated higher levels of self-esteem.

**Results**

**Preliminary Analyses**

Means, standard deviations, and descriptives for the key study variables are shown in Table 1. Bivariate correlations and ANOVAs of the study variables are presented in Table 2. Bivariate correlations showed that self-esteem was associated positively with linguistic acculturation ($r = .23, N=159, p < .01$) and related negatively with acculturative stress ($r = -.27, N = 153, p < .01$). That is, individuals who reported high levels of self-esteem spoke English more frequently and experienced lower levels of acculturative stress. Linguistic acculturation was also associated negatively with acculturative stress ($r = -.18, N = 153, p < .05$). In other words, individuals who spoke English more frequently tended to report lower levels of acculturative stress. No other significant relations were found.

**ANOVA Testing the Link Between Ethnic Labels and Acculturation Status and Related Psychological Processes**

ANOVA of the study variables revealed differences across the ethnic label typologies. Individuals who self-identified with compound labels were more linguistically acculturated compared to those who identified with national labels, $F(2,153) = 3.85, p < .05, \eta^2 = .05$. Significant mean differences also emerged for acculturative stress; individuals who identified with national labels reported higher levels of stress compared to those who identified with pan-ethnic and compound labels, $F(2,147) = 5.27, p < .01, \eta^2 = .07$. No significant differences were found in ethnic identity or self-esteem across the ethnic label typologies.

We conducted a series of follow-up analyses controlling for age, parent education, gender, and regional status on our study variables. Differences in linguistic acculturation and acculturative stress remained as a function of the ethnic label typologies even after these variables were entered as covariates in the model.

**Discussion**

In an increasingly heterogeneous society such as the U.S., it is important to study ethnic identity because ethnic group membership is linked to one’s self-concept and identity formation. Because ethnic self-identification may reflect acculturative changes, we designed this study to examine ethnic labels and their relevance to acculturation status and related psychological processes among Mexican origin college students.
Our findings revealed differences in linguistic acculturation and acculturative stress across the three ethnic label typologies. Those who identified with their country of origin (“Mexican”) were more likely to frequently speak Spanish (which to some degree is an index of their acculturation level) and to report higher levels of acculturative stress; meanwhile, those who self-identified with the label of the host country (“Mexican American”) reported higher frequency in speaking the language of the host society (English) and less acculturative stress. This finding supports prior literature on acculturation and ethnic identification in which immigrants tended to shift from national to compound label identification over time (cf., Phinney, Horenczyk, Liebkind & Vedder, 2001). Furthermore, studies have documented increased levels of stress among individuals who were less acculturated to the host society. Thus, it is plausible for individuals to experience high levels of acculturative stress when self-identifying with their country of origin.

Contrary to expectations, no differences emerged for self-esteem or ethnic identity across the ethnic label typologies. One possibility of this finding may be due to the conceptualization of ethnic identity. In a review of the literature on ethnic identity and self-esteem, researchers (Umaña-Taylor, Diversi, & Fine, 2002) noted that ethnic identity and self-esteem are positively related only when the degree of ethnic identity is examined in conjunction with the value one places on having a Hispanic identity (in this case, Mexican identity). As such, the link between ethnic self-labels and self-esteem may be moderated by the importance in which individuals place their ethnic identity on their overall self-concept. For some populations, ethnic labels may take on political significance and be of greater importance to their identity. Another possibility of this finding may be due to the underlying complexity of ethnic identity. Although ethnic self-labels entail one dimension of ethnic identity, they may not be associated with one’s sense of self-esteem. In fact, ethnic self-labels may be a distal factor to ethnic identity because it is a demographic indicator that does not directly reflect the strength or valence of one’s affirmation, sense of belonging, or commitment to an ethnic group. As such, ethnic identity may encompass components that are related, yet distinct from one another; and subjective feelings and emotions may not necessarily extend to one’s behaviors (Yancey, Aneshenesel, & Driscoll, 2001). Future research could seek to distinguish and tease apart the various components of ethnic identity as well as whether/and to what extent individuals attribute feelings of self-worth to their ethnic self-identification.

In the current study, findings revealed that ethnic identity was unrelated to all of the variables studied, and it may be due to the role of context. Research examining the contextual effects of ethnic identity development has found less diverse contexts to promote greater ethnic awareness and a more salient sense of ethnic identity among Latinos (Umaña-Taylor, 2003). In the current investigation, the college contexts were in California and Texas, in the western region of the U.S., where the majority of Mexicans Americans reside and where most of the ethnic enclaves are formed and maintained (Marotta & Garcia, 2003). Thus, for the late adolescents/emerging adults in the current study, their college campuses and the surrounding communities are diverse environments compared to other regions of the nation. It is possible that because these individuals have always had the venues to engage in ethnic behaviors and to participate in ethnic traditions and activities, their college experience may not necessarily serve as the potent catalyst for ethnic identity affirmation, exploration, or awareness. As such, the subjective dimensions of ethnic identity may not be relevant to their acculturation status and related psychological processes.

It is important to mention the distribution of individuals who identified with pan-ethnic labels in the current study. As noted earlier, the 1990 to 2000 decade reflected an increase of Latinos identifying with pan-ethnic labels rather than national labels. Guzmán and McConnell (2002) suggested that this pan-ethnic preference may be prevalent particularly for those strategizing for political unity among the collective Hispanic/Latino group, for individuals whose parents are from different Hispanic countries, and for U.S. born Latinos who might identify more strongly with the U.S. than with their country of origin. In the current investigation, the trend of individuals identifying with pan-ethnic labels did not resemble that of the national pattern. This inconsistency is important to highlight because it underscores the uniqueness of the late adolescent Mexican origin population as well as the inherent heterogeneity of the Latino population. That is, compared to the nationwide sample of Latinos, late adolescents and Mexican origin individuals may not endorse the same preference for pan-ethnic labels. Such a discrepancy highlights the need to discriminate the differences between different Latino age groups and subgroups, in order to better understand the meanings behind individuals’ endorsement of particular ethnic labels.

There are a number of limitations to consider in the current study. First, the cross-sectional nature of this investigation precludes any inference of causality regarding ethnic labels and their association with...
acculturation status and related psychological processes. That is, the findings from this study cannot be taken to explain that certain types of self-labels lead to specific outcomes or that certain ethnic labels are representative of any particular acculturation status or related psychological process. Second, acculturation status was assessed by linguistic indicators. Language use has been the most commonly used proxy measure for acculturation; however, researchers have argued that it is unidimensional and may not fully capture other proximal dimensions of acculturation (Arends-Tóth & van de Vijver, 2006; cf. Zamboanga, Raffaelli, & Horton, 2006). Therefore, more proximal measures such as cultural values and attitudes can be incorporated in future studies to assess the complexity of acculturation status. Future work in this area might therefore conduct longitudinal studies with multidimensional aspects of acculturation to examine the developmental pathway of ethnic identity and to capture the holistic and dynamic nature of cultural adaptation over time. Longitudinal studies would also allow us to better understand acculturation as a process rather than a status and to tease apart the direction of the association between ethnic identity and acculturation. Third, the role of context is an important consideration in our understanding of ethnic identity and acculturation-related processes. For example, regional differences should be taken into consideration to account for demographic dissimilarities that may influence individuals’ experiences and worldviews. Also, because identity is a fluid and dynamic construct that varies across time and space, future research should consider contextual factors such as the cultural context of the data collection site, the ethnic composition of social groups in the nearby neighborhood, and the ethnic identity of peers, close friends, and family members. Finally, the findings from this study might not generalize to other Latino subgroups, Mexican nonyouth, youth who do not attend public universities (e.g., private and/or religious institutions), or even late adolescents/emerging adults in the community because the study participants were college attendees.

Despite these limitations, this investigation contributes to the research on ethnic identity in several ways. First, ethnic self-identification is a markedly unique self-construct compared to the subjective components that capture the valence of an individual’s ethnic identity. Ethnic labels provide added insight into an individual’s perception of the self; however, this specific component of ethnic identity has not been previously examined. Second, the current study utilized an open-ended question to ask for participants’ ethnic label. Scholars have cautioned against the use of standardized and government-established ethnic categories (e.g., checked boxes) to categorize subgroups that have neither been defined by nor used by the people (Clark & Hofsess, 1998). Thus, by providing participants with the opportunity to openly self-identify, we did not assume individuals’ ethnic identification, which has been criticized as a methodological problem in ethnic identity research (Phinney, 1990). Finally, the current investigation accounted for the heterogeneity of the Latino population because it was restricted to young adults of Mexican background. Research with Latinos has collapsed different subgroups and overlooked the distinctions among this population such as nationality, immigration history, language dialect and pronunciation, and so forth. (Umaña-Taylor & Fine, 2001). Furthermore, with approximately 80% of the Latino population under the age of 25 (Marotta & Garcia, 2003), it was important to understand how ethnic identity operates among emerging adults—a growing population that is characterized by identity exploration (Arnett, 2006; Phinney, 2006).

In conclusion, in a world where there is growing diversity among groups and subgroups that were once considered one broad category, it is essential to differentiate and better understand the reasons for variations in individuals’ self-identification. Our findings highlight the complexity of ethnic identity and generate questions for future research. Recognition of the complexities underlying these constructs may help researchers, educators, and programmers, to better understand and conceptualize ethnic identity. Although the current study addressed some relevant gaps in the literature, there is still much to be done to further understand the mechanism that helps us make sense of our experiences, our self-identification, and ultimately, who we are.

**References**


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