3 Predictors of a New Typology of Youth Violence
Scott R. Weaver and Katherine Dunham, State University of New York, College at Plattsburgh

13 Students’ Attitudes Toward Mental Illness: A Macao–U.S. Cross-Cultural Comparison
Elvo Kuai-Long Sou and Lori M. Irving, Washington State University at Vancouver

23 Impact of Different Social Models on Young Adults’ Views of Marriage and Divorce
Angela D. Nickell and Marcela Raffaelli, University of Nebraska–Lincoln

31 Effects of Racial Background and Sex on Identifying Facial Expressions and Person Perception
Shann E. Sagles, Sharon Coley, Germilina Espiritu, Patricia Zahregian, and Richard Velayo, Pace University

38 The Relation Between Obsessive–Compulsive Traits, Frontal Lobe Functioning, and Visual Recall
Kelli D. Nelson, Noah V. Clayton, and Kevin R. Byrd, University of Nebraska at Kearney

45 Reviewers
46 Psi Chi Research Awards and Grants
48 Subscriptions

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Predictors of a New Typology of Youth Violence

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ONE OF THE MOST IMPORTANT PUBLIC HEALTH problems facing the country today is youth violence (Edelman, 1995). Perpetrators of violence are getting younger, and the severity of the violence is increasing (Dahlberg, 1998). Theoretically, the identification of factors that either precipitate or inhibit the development of violent behavior can assist in the identification of youth who are at risk for engaging in violent behavior and in the development of prevention and intervention strategies. Identification of youth who are at greater risk than the general population for engaging in violent behaviors is essential for directing intervention strategies toward those youth to prevent the onset or degeneration of violent behaviors. To focus more intensive prevention efforts toward at-risk youth using valid risk and protective identifiers is more cost effective than providing intensive interventions to the entire population or haphazardly to various subpopulations. In the latter instance, youth who might not need the intervention will be utilizing limited resources that would be better directed toward those youth who have a greater need, as determined by the presence of risk factors or the absence of protective factors. Additionally, if researchers can establish relations between risk and protective factors and youth engagement in violent activities, then the manipulation of these factors or of the processes through which these factors have their influence will (if causally related) result in a change in the level of violent behavior. It is this assumption that provides the basis for prevention science (Dahlberg, 1998; Group for the Advancement of Psychiatry, Committee on Preventive Psychiatry, 1999).

Basic violence research, effective communication between researchers and practitioners who are establishing interventions to reduce violent behavior, and evaluation of such interventions will benefit from the common acceptance of a valid definition of what constitutes violence (Kingery, 1998). Unfortunately, the conceptual and operational definitions of violence used by researchers have varied considerably, and thus significant disagreement exists over which definition is more valid and how to best measure violence.

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(Kingery, 1998; Pettit, 1997). Some researchers have defined violence in terms of covert motivations and information-processing mechanisms, whereas others have viewed violence as overt behavioral manifestations. Kingery (1998) cited several instances in which previous studies on violence have used psychometrically untested or invalid measures of violence, conceptually limited operational definitions of violence, or measures of violence that combine multiple diverse behaviors, despite the fact that they might differ greatly in terms of their precipitating factors, perceived and actual effects, and form. Subsequently, there has been substantial variation among researchers regarding exactly what behaviors constitute violence (Kingery, 1998). Citing the problems that these conditions create for our understanding of the nature of violence and in the evaluation of prevention efforts, Kingery argued effectively for a psychometrically sound measure of youth violence appropriate for a diverse youth population and a broad range of violent behavior. He subsequently developed the Adolescent Violence Survey (AVS). The AVS consists of six subscales that define a typology of violence: (a) common violence, (b) inventive violence, (c) passive aggression, (d) severe menacing, (e) menacing language, and (f) impulsive violence. These six subtypes are the primary focus of the present study.

Of central relevance to the present study is the assumption that if these subscales truly depict different forms of violence, then it is conceivable that different factors might predict each subtype of violence. The identification of different predictors of the violence subtypes has meaningful implications for future violence intervention efforts. For example, Kingery (1998) found initial evidence that suggests that empathy might inhibit low-level anger from progressing to common acts of violence, but might not prevent more severe forms of anger from progressing to severe acts of violence. Substantiating evidence for these observations would validate the use of interventions that attempt to instill empathy within individuals displaying more common forms of violence but not for those persons committing the more severe forms of violence. Because effective prevention is dependent on the ability to accurately identify at-risk populations and the knowledge of the predictive factors and processes that lead to violence, the identification of violence subtypes that distinguish between different groups of youth and that are precipitated by different factors is of major importance to the development of effective prevention and treatment programs.

The present exploratory study examined the relation between the violence subtypes and several factors that predict violent behavior in adolescents: empathy, locus of control, parenting style, academic achievement, father presence, sex, and socioeconomic status (SES). This study expanded on Kingery’s (1998) initial research on the subtypes by including additional predictors (i.e., locus of control, parenting style, and SES) and by using a sample composed of adolescents who are older and possibly very different than that used by Kingery (this inference is based on the fact that the current sample was drawn from a college population). If the data from the present study suggest that the violence subtypes are predicted by different factors, then this finding would further generalize Kingery’s initial findings to different populations and should encourage future study into this typology of violent behaviors. Given the exploratory nature of the study, we offer only one hypothesis based on Kingery’s findings: we expect empathy to have a greater negative correlation with the common violence subscale than the inventive violence subscale. Other hypotheses based on Kingery’s findings are not offered because his other conclusions regarding the differential prediction of the violence subtypes involved variables not included in this study. Also, Kingery did not report other differences between the violence subtypes because his primary focus was presenting the psychometrics of the AVS, not the differences in predictors of the subtypes. However, we hypothesize that all of the variables included in this study will correlate with the total violence composite. We discuss previous research on these predictors and the expected direction of the relations between the present study’s predictors with the total violence composite below.

Previous researchers have found evidence that suggests that empathy might be a protective factor for violent behaviors (e.g., Kingery, 1998; Kingery, Biafora, & Zimmerman, 1996). Kaukiainen et al. (1999) found that empathy (with social intelligence partialed out) was negatively associated with physical, verbal, and indirect violence (i.e., passive aggression). These researchers reasoned that empathetic individuals are unlikely to harm others because they will be able to appreciate the emotional distress they inflict through such actions. Other studies have also found similar results (Bryant, 1982). However, Kingery (1998) found that empathy did not correlate with the more severe forms of violence, such as the use of a weapon or sexual assault.

Bryant (1982) found that empathy varies as a function of sex, with men displaying significantly lower levels of empathy than women. However, Karniol, Gabay, Ochion, and Harari (1998) suggested that gender-role orientation (i.e., the continuum from
feminine to masculine) accounts for most, if not all, of the sex differences in empathy. This finding notwithstanding, the connection between sex and empathy is important to take into consideration because being male is, unequivocally, a risk for violent behavior (Hastings & Hamberger, 1997; Jackson & Foshee, 1998, Kingery, 1998).

Another focus of youth violence research has been the family environment, and, more specifically, parenting practices (Dahlberg, 1998; Webber, 1997). Jackson and Foshee (1998) examined the link between two dimensions of parenting style, responsiveness and demandiningness, and violent behavior during adolescence. A responsive parent is aware of, and empathetic with, the child’s developmental and emotional needs. A demanding parent establishes and upholds clear behavior guidelines and provides the child with structure. Parents’ use of a high degree of both demanding and responsive behaviors is considered ideal for healthy child development (although this arrangement may not be true for less individualistic and more familialistic or collectivistic cultures; Lee-Oh, 1995). Jackson and Foshee collected data on adolescents’ perceptions of their parents’ parenting style and self-reported history of violent behaviors. The results indicated that lower levels of both responsive and demanding parenting practices predicted greater levels of violent behavior. These effects were much more pronounced for women than men. Other researchers have found similar results using an African American sample (Taylor, Casten, & Flickinger, 1993; but see Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994, for possible differences between African American and Caucasian samples in outcomes of perceived authoritarian parenting).

Researchers have also found an association between father absence and violent behavior\(^1\). Austin and Arthur (1992) obtained evidence that suggests a positive relation exists between father absence and violent victimization, which they conclude is partially a function of an increase in violent interactions in which the adolescent is involved. Additionally, Bernadett-Shapiro, Ehrensaft, and Shapiro (1996) found that father participation is positively correlated with the development of empathy (a potential inhibitor of violent behavior; Kingery, 1998) in boys. Kingery (1998) found that participants from a father-absent family displayed greater levels of impulsive violence than those participants with a father present.

The research literature suggests that locus of control might play a role in increasing the tendency to engage in violent behavior. Hollin and Wheeler (1982) found that violent offenders reported a more external locus of control (however, that study was limited by a small sample size, \(N=20\)). A hypothesis suggested by Dupper (1998) might explain the connection between an external locus of control and violent behavior: individuals possessing an external locus of control believe that they have little control over what happens to them and, as a result, often refuse to take responsibility for their behavior. Perhaps these individuals also are less deterred from using violence because they are less likely to connect their behavior to its consequences.

SES represents a combination of variables, such as employment status, education, and income. Previous research has suggested that adolescents of lower SES show a greater incidence of violent behavior than adolescents of a higher SES (Hastings & Hamberger, 1997; Heimer, 1997). The relation between SES and violence is complicated, involving mediation and moderation by several other variables (e.g., fewer resources, greater exposure to violence, fewer educational opportunities; Dahlberg, 1998). Therefore, individuals with lower SES should display more violence than individuals with higher SES.

The present study used a college sample to examine whether the predictors reviewed here would differentially predict the violence subtypes. Based on Kingery’s (1998) research, we expected empathy to have a stronger negative correlation with common violence than with inventive violence. The results of this study have the potential to influence future research that might impact the design of future interventions for at-risk youth.

\[\text{Method}\]

**Participants**

A convenience sample of 131 students (86 women; 45 men) from undergraduate psychology classes at a small university in northern New York volunteered to participate in the present study. We excluded one male participant from further analyses due to written comments and irregular responses that brought into question the integrity of his answers. The sample was 80% Caucasian, 6.9% Hispanic, 4.6% African American, 3.1% Asian American, and 5.4 % other; ages ranged from 18 to 44 years (\(M=20.6, SD = 3.95\)). The majority of the participants lived with both biological parents from birth to 12 years (77.2%) and 13 years to 18 years (65.4%).

\(^{1}\)There is evidence to suggest that the relation between father absence and psychosocial outcomes may not be as strong in African American families. This relation perhaps occurs because continued father participation, despite not living with the child, and extended kinship support are often present in African American communities (Salem, Zimmerman, & Notaro, 1998).
Measures

Demographics. Participants provided their age, sex, year of college, and ethnicity. For data analysis, we categorized ethnicity as either Caucasian or Minority to avoid very small group sizes. Participants’ self-reported grade point average (i.e., A, B, C, or D) represented academic achievement. Participants also described the primary structure of their family (i.e., both biological parents, stepfather/biological mother, stepmother/biological father, mother only, father only, grand-parents as guardians, or other) from birth until 12 years of age and from 13 years of age until 18 years of age. By obtaining responses for both age categories we attempted to account for the fact that family structure might change between childhood and adolescence. Due to the small number of participants in some family structure categories, we collapsed family structure responses into either father-present (this included biological father- and stepfather-present households) or father-absent categories. Additionally, we used participants’ self-reported parents’ occupations to place them into occupational categories obtained from Stevens and Featherman (1981) as an indicator of participants’ SES levels. We then combined the participants into either high SES (professional or managerial) or low SES (all other) categories to (a) create groups that were more equal in size, and (b) work with the lack of specificity in some of the participants’ responses to these items that hindered assignment to one of the original categories.

Locus of control. We measured locus of control with Nowicki and Strickland’s (1973) abbreviated scale for adolescents. The scale consists of 21 items (for example, “Do you believe that most problems will solve themselves if you just don’t fool with them?”) that ask for a “no” or “yes” response. Higher scores denote a more external locus of control. For the current sample, Cronbach’s alpha was .74, indicating satisfactory internal consistency.

Empathy. Mehrabian and Epstein’s (1972) Questionnaire of Emotional Empathy (QMEE) assessed empathy. This scale consists of 33 items (e.g., “It makes me sad to see a lonely stranger in a group”); each item uses a 9-point Likert scale ranging from very strong agreement to very strong disagreement. Higher scores on the QMEE indicate a greater accuracy in detecting the emotions of others and feeling, to some degree, those emotions. This scale’s Cronbach’s alpha coefficient for the current sample was .82.

Parenting style. The Authoritative Parenting Index (API; Jackson, Henriksen, & Foshee, 1998) measured perceived parenting practices. Participants completed separate versions for their mother and father (or other female or male caretakers if the participants were not under the guardianship of their biological mother or father). The scale consisted of 16 items with a 4-point rating scale consisting of just like him (her), a lot like him (her), sort of like him (her), or not like him (her). The demandingness subscale consisted of 7 items, and the responsiveness subscale consisted of 9 items. Higher scores indicated higher levels of responsiveness and demandingness. Stice and Barrera (1995) collected data on parental support and control (roughly equivalent to responsiveness and demandingness, respectively) from both the children and parents and were able to replicate all but one of the effects found using adolescent self-report data with the mother self-reported data. This finding lends support for the use of children’s report of their parents’ parenting behaviors. In the present study, mother demandingness, mother responsiveness, father demandingness, and father responsiveness subscales displayed Cronbach’s alpha coefficients of .79, .86, .84, and .87, respectively.

Violence. Using Kingery’s (1998) Adolescent Violence Survey (AVS), participants provided data on their use of violence throughout their lifetime. The AVS consists of 41 items, forming six subscales and a 1-item honesty check (i.e., participants indicated whether they were completely honest, pretty honest, not very honest, or not honest at all). The common violence subscale has 7 items (e.g., “Hit, punched, or slapped someone with your hand or fist”), inventive violence has 9 items (e.g., “Forced someone to hurt himself/her”), passive aggression has 12 items (e.g., “Played rougher with someone than you normally would during sports to hurt him/her”), severe menacing has 4 items (e.g., “Threatened to hurt someone with a weapon”), menacing language has 4 items (e.g., “Threatened to harm someone”), and impulsive violence has 5 items (e.g., “When I’m angry and feel the sudden urge to hit someone, I usually do hit him/her”). All AVS items appeared to be appropriate for use with an older population, despite the fact that it was based on research with younger adolescents. Participants responded to all subscales except impulsive violence on a 9-point frequency scale (i.e., never, once, twice, 3–5 times, 6–9 times, 10–19 times, 20–29 times, 30–39 times, or 40 or more times). The impulsive subscale used a 5-point Likert scale ranging from strongly disagree to strongly agree. In response to the honesty check item, 70% indicated that they were completely honest, whereas 30% stated they were pretty honest. Although Kingery (1998) excluded all participants who did not select completely honest, the authors included participants who selected pretty honest in the present study because seven participants commented that they selected pretty honest due to not being able
to remember the exact number of times they committed an act of violence during informal postsurvey discussions. Therefore, it is likely that most, if not all, of those participants who selected pretty honest were, in fact, being honest, but were unsure of the accuracy of their memory.

Internal consistency coefficients for the overall violence score and the six subscales (common violence, passive aggression, severe menacing, menacing language, impulsive violence, and inventive violence) for the current sample were .92, .89, .83, .60, .75, .79, and .80, respectively. Although the internal consistency coefficient for severe menacing is questionably low, this scale was composed of only four items; therefore, the obtained regression coefficients predicting this scale will be attenuated.

Procedure
Participants were recruited by visiting psychology classes. We informed the students of the opportunity to participate in a research project and that they would receive extra credit for their psychology course in return for their participation. We also informed the participants that their responses would be kept confidential. Participants completed the surveys in approximately 20 min in small groups outside of class time. The authors partially counterbalanced the AVS with the other scales (i.e., locus of control, empathy, and perceived parenting behaviors) and found no significant effects for scale order2.

Results
Descriptive statistics for the main variables are presented in Table 1. Low-level acts of violence were more common than more severe acts of violence. Of those participants who reported at least one act of violence in their lifetime on the AVS, some of the more common acts were hitting (78%), kicking (67%), hitting with objects (71%), shoving/tripping (71%), talking about someone’s faults so others would

<table>
<thead>
<tr>
<th>Predictors</th>
<th>n</th>
<th>Theoretical range</th>
<th>Obtained range</th>
<th>M</th>
<th>SD</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsiveness</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mother</td>
<td>122</td>
<td>9–36</td>
<td>13–36</td>
<td>29.93</td>
<td>5.60</td>
<td>−1.16 (.22)</td>
</tr>
<tr>
<td>Father</td>
<td>108</td>
<td>9–36</td>
<td>11–36</td>
<td>27.92</td>
<td>5.95</td>
<td>−.64 (.23)</td>
</tr>
<tr>
<td>Demandingness</td>
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<tr>
<td>Mother</td>
<td>122</td>
<td>7–28</td>
<td>7–28</td>
<td>15.48</td>
<td>4.57</td>
<td>.29 (.22)</td>
</tr>
<tr>
<td>Father</td>
<td>108</td>
<td>7–28</td>
<td>7–28</td>
<td>13.55</td>
<td>5.06</td>
<td>.82 (.23)</td>
</tr>
<tr>
<td>Locus of control</td>
<td>127</td>
<td>0–21</td>
<td>1–17</td>
<td>6.14</td>
<td>3.55</td>
<td>.67 (.22)</td>
</tr>
<tr>
<td>Empathy</td>
<td>130</td>
<td>−132–132</td>
<td>−23–109</td>
<td>46.38</td>
<td>26.01</td>
<td>.02 (.21)</td>
</tr>
<tr>
<td>Overall violence</td>
<td>118</td>
<td>40–340</td>
<td>45–217</td>
<td>99.24</td>
<td>34.21</td>
<td>1.14 (.22)</td>
</tr>
<tr>
<td>Common violence</td>
<td>128</td>
<td>7–63</td>
<td>7–61</td>
<td>23.89</td>
<td>11.93</td>
<td>.77 (.21)</td>
</tr>
<tr>
<td>Inventive violence</td>
<td>128</td>
<td>9–81</td>
<td>9–42</td>
<td>14.42</td>
<td>6.72</td>
<td>1.75 (.21)</td>
</tr>
<tr>
<td>Menacing language</td>
<td>127</td>
<td>4–36</td>
<td>4–36</td>
<td>17.05</td>
<td>6.84</td>
<td>.35 (.22)</td>
</tr>
<tr>
<td>Severe menacing</td>
<td>129</td>
<td>4–36</td>
<td>4–16</td>
<td>5.16</td>
<td>2.61</td>
<td>2.75 (.21)</td>
</tr>
<tr>
<td>Impulsive violence</td>
<td>129</td>
<td>5–25</td>
<td>5–24</td>
<td>8.16</td>
<td>3.76</td>
<td>1.28 (.21)</td>
</tr>
</tbody>
</table>

Note. Numbers in the parentheses represent the standard error of skewness values.

2ANOVA tests were conducted for scale order effect for each scale and subscale (no Fs were significant at the alpha = .05 level, except for mother demandingness, $F[3, 118] = 3.127, p < .05$). However, none of the post hoc tests for mother demandingness were significant using the Bonferroni correction to control for Type I error.
not like them (77%), playing rougher than normal in sports (46%), breaking something belonging to another (53%), making verbal threats (50%), yelling (95%), and using threatening body language (86%). Relatively few participants reported forcing someone to do something sexual against their will (5%), making unwanted sexual gestures (12%), and making threats with a weapon (17%). A fairly sizable portion indicated that when they feel a violent impulse, they do not stop to think about consequences before they act (12%) and feel that people should treat them with more respect if those people do not want them to respond violently (15%).

Not surprisingly, all but one of the violence subscales (i.e., menacing language) displayed considerable positive skewness. The authors used natural logarithmic transformations to reduce the skewness (thereby bringing the variables closer to normality) for total violence, common violence, and passive aggression: with transformations, $g_s = 0.31 (0.22)$, $-0.30 (0.21)$, and $-0.01 (0.22)$, respectively. Because of their more extreme skewness, severe menacing, impulsive violence, and inventive violence were transformed to their negative reciprocal: with transformations, $g_s = 1.64 (0.21), 0.23 (0.21)$, and $0.46 (0.21)$, respectively. The use of these transformations to reduce positive skewness, residual nonnormality, and heteroscedasticity is an accepted and common practice (Fox, 1991).

Only a few of the predictor variables were significantly correlated with the violence subscales and overall violence composite score after using multistage Bonferroni correction to control for Type I error rate inflation (see Table 2, Larzelere & Mulaik, 1977). There was considerable loss in power after using the multistage Bonferroni correction, and, therefore, it is likely that, with increased sample size, other significant correlations between the predictor and violence variables would emerge. Sex (i.e., being male) was positively correlated with severe menacing violence. Father responsiveness was positively correlated with impulsive violence. The authors did not conduct a statistical test on the difference in the correlations of empathy with common violence and empathy with inventive violence because the initial hypothesis presupposed negative correlations between empathy and the violence subscales. Instead, a positive correlation was obtained between empathy and common violence, therefore rendering this hypothesis untestable.

We used forward stepwise regression analyses to create models for each violence subscale and the overall violence composite score.3 Mother responsiveness and sex (i.e., being male) predicted greater total violence, explaining 12.2% of the variance (see Table 3). Sex (i.e., being male), greater empathy, and lower mother responsiveness predicted increased levels of common violence, accounting for 10.3% of the variance (see Table 4). Sex (i.e., being male) was the only significant predictor of inventive violence ($B = .01$, adjusted $R^2 = .06, p < .01$) and passive aggression ($B = .239$, adjusted $R^2 = .07, p < .01$). Sex (i.e., being male) and greater empathy predicted menacing language, explaining 9.3% of the variance (see Table 5). Less father responsiveness, minority status, and sex (i.e., being male) predicted greater impulsive violence, explaining 27.3% of the variance (see Table 6). Sex (i.e., being male) and father absence during adolescence predicted greater severe menacing violence, explaining 24.7% of the variance (see Table 7).

## Discussion

Consistent with previous research, male participants reported more violent behavior than female participants (Hastings & Hamberger, 1997; Kingery, 1998; Saner & Ellickson, 1996). Sex was a significant predictor of violence for the global violence score and all six subtypes of violence. Lower mother responsiveness predicted common violence, and lower father responsiveness predicted impulsive violence. However, parental responsiveness did not significantly predict any other violence subtype, and parental demandingness failed to predict any violence subtype. These findings are not consistent with previous research (Jackson & Foshee, 1998). The failure of perceived parental demandingness to significantly predict any of the violence subtypes might be due to the fact that the participants, as young adults, were underestimating the demandingness of their parents, which might decrease with age as the participant acquires greater autonomy and more privileges. Similarly, current parental demandingness may have interfered with participants’ reports of parental demandingness during middle adolescence. This result could have occurred despite the fact that researchers explicitly instructed participants to report on their parents’ behaviors during middle adolescence. Another alternative explanation could be that the previous findings regarding the connection between parental demandingness and violent behaviors do not generalize to the current sample, which is older than the sample of eighth and ninth graders used by Jackson and Foshee (1998).

Individuals whose fathers had been present throughout adolescence reported committing fewer severe menacing acts than those participants with a father-absent family structure. Kingery (1998) rea-
### TABLE 2

**Correlations Between Predictors and Violence Scales**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Overall (N = 89)</th>
<th>Common (N = 99)</th>
<th>Inventive (N = 99)</th>
<th>Impulsive (N = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>-.05</td>
<td>-.03</td>
<td>-.02</td>
<td>-.01</td>
</tr>
<tr>
<td>3. Academic achievement b</td>
<td>.08</td>
<td>-.05</td>
<td>-.05</td>
<td>.28</td>
</tr>
<tr>
<td>4. Ethnicity c</td>
<td>-.02</td>
<td>-.06</td>
<td>-.08</td>
<td>.32</td>
</tr>
<tr>
<td>5. Father presence (0–12 years) d</td>
<td>.07</td>
<td>.04</td>
<td>.14</td>
<td>.17</td>
</tr>
<tr>
<td>6. Father presence (13–18 years) d</td>
<td>.06</td>
<td>.11</td>
<td>.12</td>
<td>.12</td>
</tr>
<tr>
<td>7. Father SES e</td>
<td>.08</td>
<td>.05</td>
<td>.11</td>
<td>.18</td>
</tr>
<tr>
<td>8. Mother SES e</td>
<td>-.01</td>
<td>.04</td>
<td>.08</td>
<td>-.02</td>
</tr>
<tr>
<td>9. Mother responsiveness</td>
<td>-.27</td>
<td>-.19</td>
<td>-.11</td>
<td>-.30</td>
</tr>
<tr>
<td>10. Mother demandingness</td>
<td>.00</td>
<td>.11</td>
<td>-.03</td>
<td>-.16</td>
</tr>
<tr>
<td>11. Father responsiveness</td>
<td>-.18</td>
<td>-.09</td>
<td>-.14</td>
<td>-.42*</td>
</tr>
<tr>
<td>12. Father demandingness</td>
<td>.02</td>
<td>.08</td>
<td>.08</td>
<td>.01</td>
</tr>
<tr>
<td>13. Empathy</td>
<td>.06</td>
<td>.11</td>
<td>-.06</td>
<td>-.18</td>
</tr>
<tr>
<td>14. Locus of control</td>
<td>.25*</td>
<td>.11</td>
<td>.17</td>
<td>.26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Passive aggression (N = 96)</th>
<th>Severe menacing (N = 100)</th>
<th>Menacing language (N = 98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>-.11</td>
<td>-.07</td>
<td>-.01</td>
</tr>
<tr>
<td>2. Sex a</td>
<td>.28</td>
<td>.46*</td>
<td>.22</td>
</tr>
<tr>
<td>3. Academic achievement b</td>
<td>-.09</td>
<td>-.18</td>
<td>-.10</td>
</tr>
<tr>
<td>4. Ethnicity c</td>
<td>-.16</td>
<td>.09</td>
<td>-.05</td>
</tr>
<tr>
<td>5. Father presence (0–12 years) d</td>
<td>-.08</td>
<td>-.09</td>
<td>-.05</td>
</tr>
<tr>
<td>6. Father presence (13–18 years) d</td>
<td>.06</td>
<td>.27</td>
<td>.13</td>
</tr>
<tr>
<td>7. Father SES e</td>
<td>.04</td>
<td>.26</td>
<td>.14</td>
</tr>
<tr>
<td>8. Mother SES e</td>
<td>-.01</td>
<td>.13</td>
<td>.04</td>
</tr>
<tr>
<td>9. Mother responsiveness</td>
<td>-.16</td>
<td>-.07</td>
<td>-.16</td>
</tr>
<tr>
<td>10. Mother demandingness</td>
<td>-.01</td>
<td>-.12</td>
<td>.08</td>
</tr>
<tr>
<td>11. Father responsiveness</td>
<td>-.15</td>
<td>-.14</td>
<td>.00</td>
</tr>
<tr>
<td>12. Father demandingness</td>
<td>-.02</td>
<td>-.08</td>
<td>-.03</td>
</tr>
<tr>
<td>13. Empathy</td>
<td>.05</td>
<td>-.16</td>
<td>.16</td>
</tr>
<tr>
<td>14. Locus of control</td>
<td>.15</td>
<td>.12</td>
<td>.10</td>
</tr>
</tbody>
</table>

*Note.* All correlations were computed with the transformed violence scales, except menacing language. Listwise deletion of participants was used for each column of correlations.

*a* Male = 1, Female = 0.

*b* C = 1, B = 2, A = 3.

*c* White/Caucasian = 0, Minority = 1.

*d* Father present = 0, Father absent = 1.

*e* High SES = 1, Low SES = 2.

*p* < .05, after using multistage Bonferroni correction to control for Type I error rate inflation (Larzelere & Mulaik, 1977).
Weaver and Dunham

**TABLE 3**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>B</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother responsiveness</td>
<td>-0.27</td>
<td>-0.02</td>
<td>0.07**</td>
</tr>
<tr>
<td>Sexª</td>
<td>0.27</td>
<td>0.19</td>
<td>0.07**</td>
</tr>
</tbody>
</table>

Note. Model-adjusted $R^2 = .12^{***}$.
ªMale = 1, Female = 0.
*p < .05. **p < .01. ***p < .001.

Academic achievement, locus of control, and SES did not significantly predict any violence subtype or global violence. These results are not consistent with previous research (Farrington, 1991, as cited in Dahlberg, 1998; Heimer, 1997; Hollin & Wheeler, 1982). The failure of SES and academic achievement to predict any violence subtype or global violence could be due to the fact that SES was crudely measured (i.e., a dichotomous variable based only on parents’ occupations) or perhaps the previous findings concerning the relation between academic achievement and violence do not apply to a college sample.

The present research could not test the hypothesis that empathy would have a greater negative correlation with the common violence subscale than with the inventive violence subscale, derived from Kingery’s (1998) initial analyses of the violence subtypes, because it presupposed that empathy would be negatively correlated with those subtypes. Readers are advised to proceed with caution in making any interpretations concerning the relation between empathy and the violence subtypes because greater empathy was associated with more menacing language and common violence, which is the opposite pattern found in previous research results (Kaukiainen et al., 1999; Kingery, 1998). The time frames for the empathy scale and the violence measure might be the source of this anomaly. Whereas the violence scale measured the frequency of violent acts over the course of the participants’ lifetime, the empathy scale measured the current level of empathy. It is possible that the participants committed the majority of violent acts some time ago when their level of empathy was likely lower, as previous research has shown that empathy tends to increase with age (Adams, 1983; Bryant, 1982).

**TABLE 4**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>B</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexª</td>
<td>0.29</td>
<td>0.32</td>
<td>0.08**</td>
</tr>
<tr>
<td>Empathy</td>
<td>0.23</td>
<td>0.00</td>
<td>0.05*</td>
</tr>
<tr>
<td>Mother responsiveness</td>
<td>-0.21</td>
<td>-0.02</td>
<td>0.04*</td>
</tr>
</tbody>
</table>

Note. Model-adjusted $R^2 = .10^{**}$.
ªMale = 1, Female = 0.
*p < .05. **p < .01.

**TABLE 5**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>B</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexª</td>
<td>0.31</td>
<td>4.58</td>
<td>0.09**</td>
</tr>
<tr>
<td>Empathy</td>
<td>0.26</td>
<td>0.07</td>
<td>0.06*</td>
</tr>
</tbody>
</table>

Note. Model-adjusted $R^2 = .09^{**}$.
ªMale = 1, Female = 0.
*p < .05. **p < .01.

**TABLE 6**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>B</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father responsiveness</td>
<td>-0.34</td>
<td>0.00</td>
<td>-0.11***</td>
</tr>
<tr>
<td>Ethnicityª</td>
<td>0.24</td>
<td>0.03</td>
<td>0.05**</td>
</tr>
<tr>
<td>Sexª</td>
<td>0.23</td>
<td>0.03</td>
<td>0.05**</td>
</tr>
</tbody>
</table>

Note. Model-adjusted $R^2 = .27^{***}$.
ªWhite/Caucasian = 0, Minority = 1. bMale = 1, Female = 0.
*p < .05. **p < .01. ***p < .001.

soned that youth reared in a home without a biological father might be less disciplined and might develop “stable attitudinal supports for violence” (p. 55). Another plausible explanation could be that the absence of a father might create an economic disadvantage, which is associated with several other risk factors for violent behavior (Heimer, 1997). It is important to note that the present study included participants with a stepfather under the father-present category. Future research should examine the stepfather- and biological father-present households separately.

The present research could not test the hypothesis that empathy would have a greater negative correlation with the common violence subscale than with the inventive violence subscale, derived from Kingery’s (1998) initial analyses of the violence subtypes, because it presupposed that empathy would be negatively correlated with those subtypes. Readers are advised to proceed with caution in making any interpretations concerning the relation between empathy and the violence subtypes because greater empathy was associated with more menacing language and common violence, which is the opposite pattern found in previous research results (Kaukiainen et al., 1999; Kingery, 1998). The time frames for the empathy scale and the violence measure might be the source of this anomaly. Whereas the violence scale measured the frequency of violent acts over the course of the participants’ lifetime, the empathy scale measured the current level of empathy. It is possible that the participants committed the majority of violent acts some time ago when their level of empathy was likely lower, as previous research has shown that empathy tends to increase with age (Adams, 1983; Bryant, 1982).
TABLE 7
Forward Stepwise Regression Model for Transformed Severe Menacing

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>B</th>
<th>s²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexa</td>
<td>.44</td>
<td>.05</td>
<td>.18***</td>
</tr>
<tr>
<td>Father presence (13–18 years)b</td>
<td>.22</td>
<td>.06</td>
<td>.05*</td>
</tr>
</tbody>
</table>

Note. Model-adjusted $R^2 = .25***$.

*aMale = 1, Female = 0.
*bFather present = 0, Father absent = 1.
*p < .05. **p < .01. ***p < .001.

In summary, as Kingery (1998) argued, the AVS subscales represent a typology of violence with different predictors for each subtype. Sex (i.e., being male) was the only variable that predicted all six violence types. Less father responsiveness and minority ethnic status were predictive of impulsive violence but not for any other violence subtype. Less mother responsiveness predicted common violence but was not significant for any of the other violence subscales, and higher levels of empathy predicted common violence and menacing language only. These results depict a typology of violence in which common violence, impulsive violence, severe menacing, and menacing language (to a lesser degree) differ in terms of their predictors from each other and other violence types. This study offers no evidence to suggest that inventive violence and passive aggression have different predictors. Sex was the only significant predictor for both violence subtypes, and future studies that incorporate additional predictor variables that were not included here might reveal different predictors for these violence subtypes.

Several limitations of the current study need to be addressed. First, the external validity was limited by the restricted sample; the results might generalize only to the population from which the sample was drawn (i.e., largely nonminority, older adolescents and young adults attending a moderate-sized college in the northeastern United States). The small sample also limited the statistical power of the analyses. However, it is noteworthy that the results of the present study were similar to Kingery’s (1998) findings with a sample of eighth- and ninth-grade students. Another limitation is that the authors crudely measured SES and academic achievement, and, therefore, the present study might not represent an adequate assessment of their relation to the violence subtypes.

A third limitation is that the time frames for certain measures differed from each other, possibly leading to the anomalous positive correlation between empathy and some of the violence scales. However, the authors believe that the time frame issue does not compromise the validity of the results regarding the role of perceived parenting behaviors and locus of control as predictors of violent behavior. All participants were asked to report on their perception of their parents’ levels of demandingness and responsiveness when they were children and adolescents. Additionally, the authors are not aware of any research that shows locus of control varies with age.

A fourth limitation is that levels of some of the nominal variables (e.g., sex) were represented by unequal group sizes. However, the effect of unequal group sizes will only serve to attenuate the regression coefficients instead of creating spurious findings (Cohen & Cohen, 1983). As the probability of a category deviates from $p = .5$, in either direction, the variance of that variable is reduced. Because the correlations between that variable and other variables are directly dependent on the variance of the nominal variable (all other things being equal), the obtained relation will be reduced in size.

Fifth, the authors collected data from a single source (i.e., participant self-report), therefore possibly creating the problem of shared method variance. Future studies should collect data from other sources (e.g., parents, archived records, or direct observation). A final note should be made with regard to the effect sizes (i.e., percentage of variance accounted for) obtained in this study. The percentage of variance accounted for by the predictor variables ranged from 9% to 25%. Previous research has identified several factors that can account for unique, but relatively small, variations in violent behavior (Dahlberg, 1998). This result is likely a function of the multideterministic nature of violence. Furthermore, Abelson (1985) provides a cogent argument for how the variance contributions made by a factor, as determined in a single study, may underestimate the overtime variance contribution when the factor’s influence cumulates over time. An argument could be made that many (if not all) of the predictor variables examined in this study could cumulate in their influence on violent behavior over time; therefore, the relatively small effect sizes obtained might underestimate their influences in the long run.

Even given these limitations, the findings from this study have significant implications for future research and practice. If a typology of violence does exist, as supported by the current study, future research is needed to build on the current understanding of different violence types. Future research should examine additional predictors of the violence sub-
types that were not examined by Kingery (1998) or this study. Such studies could have a meaningful role in the design of violence prevention and intervention programs. If predictors differentially predict the violence subtypes, the presence of different predictors will, if causally related, predispose a child to different types of violent behavior, and practitioners could use this information to circumvent the onset of violence through different intervention strategies. Future research needs to use longitudinal designs using the AVS to support causal conclusions about the predictors of the violence subtypes.

In conclusion, the current study built upon the initial research conducted by Kingery (1998) of a new typology of youth violence by examining additional predictors and utilizing a more comprehensive measure of empathy. The results from this study suggest that well-established predictors of global violence measures have varied relations with the more specific violence subtypes. Impulsive violence and common violence appear more distinct than passive aggression, severe menacing, and inventive violence. Greater understanding of this violence typology has the potential to positively impact violence prevention and intervention program design pending future longitudinal research.

References


Students’ Attitudes Toward Mental Illness: A Macao–U.S. Cross-Cultural Comparison

The present study compared attitudes toward mental illness among college students in Macao, the United States (U.S.), and Macao students studying in the U.S. A total of 303 undergraduate students participated in the study by completing a self-report survey regarding their perceptions of mental illness. Students in Macao had the most negative attitudes and shame regarding mental illness. Macao students in the U.S. had attitudes intermediate to those of U.S. and Macao students. The findings are generally consistent with the literature and suggest an acculturation effect on the attitudes of Macao students in the U.S.

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Washington State University at Vancouver

The growth of community mental health has been accompanied by increasing interest in public attitudes toward mental illness and persons diagnosed as mentally ill. The public continues to perceive mental illness negatively (Ojanen, 1992), and public attitudes appear to be a crucial factor in predicting the success of community care (Chou & Mak, 1998). Ahmed and Viswanathan (1984) found that members of the general public consider persons diagnosed as mentally ill to be dangerous, dirty, unpredictable, and worthless. Such negative attitudes affect funding and recruitment of caregivers for community care programs (Bhugra, 1989). Furthermore, negative attitudes may result in less social support for people diagnosed as mentally ill living in the community. In turn, low levels of social support are associated with lower psychiatric service utilization and poor outcomes for persons diagnosed with severe mental illnesses (Albert, Becker, McCrone, & Thornicroft, 1998). These research findings indicate that public attitudes toward mental illness are important to the efforts of rehabilitating persons diagnosed with a mental illness.

Extant research indicates that there are cross-cultural differences in attitudes and beliefs about mental illness, and similar differences exist among different ethnic groups living in the U.S. For example, research has consistently shown that Chinese living in the U.S. as well as in other nations hold negative views about mental illness. Cheung (1990) and Yang (1989) found that Chinese residing in Hong Kong and Beijing were afraid of and avoided contact with persons labeled as mentally ill and regarded them as a danger to the community. Chinese also reported feeling ashamed to have mental illness in their family (Lee, 1986). Shokoohi-Yekta and Retish (1991) found that, in comparison to U.S. graduate students, Chinese graduate students from mainland China were...
more likely to view people diagnosed with a mental illness as dangerous, and to think that they require “coercive handling” and “restrictive intervention.”

In addition to holding different attitudes toward mental illness, Chinese and Americans have different patterns of help-seeking behavior when confronted with a mental health issue. When dealing with a mental health issue, Chinese rely heavily on self-help measures, after which they turn to their primary social support network (i.e., family and friends). Chinese turn to professionals, including psychiatrists, counselors, and social workers, only after they have exhausted their personal resources, and this approach results in an extended delay in seeking and receiving help (Cheung, 1986; Lee, 1986). This delay in seeking help from a professional is related to stigma about being seen as having a mental illness, and to the importance that Chinese assign to emotional restraint and “saving face” (Lee, 1986).

Although there are studies investigating attitudes toward mental illness of Chinese living in mainland China, Taiwan, Hong Kong, and the U.S., to our knowledge, there have been no studies of perceptions of mental illness in Macao, a “Special Administrative Region” of China located in the southeast portion of this nation. Macao is a peninsula of approximately 24 square kilometers (9.3 square miles) with a population of 437,500, 95% of whom are Chinese (Macao Statistics and Census Service, 2001). In 1999, Macao was returned to Chinese rule after being governed by Portugal for over four centuries. Because of Macao’s unique blend of Chinese and Portuguese cultures as well as its unique social and governmental structures, Macao people’s attitudes toward mental illness (and other issues) may differ from those of people in other Chinese regions.

Macao is unfamiliar to many people in the U.S.; therefore, it may be helpful to provide a brief description of Macao and its mental health system. Macao is densely populated and relatively economically advanced. According to the Macao Statistics and Census Service (2001), Macao had a gross domestic product of approximately 49 billion Macao dollars (approximately 6 billion U.S. dollars) in 1999. Despite its favorable economic standing, Macao’s mental health system is relatively poor. To the knowledge of the first author, a native Macao citizen, Macao has a psychiatric ward in a government hospital and a newly built psychiatric hospital as inpatient treatment facilities for persons diagnosed as mentally ill. In Macao, there is only one newly built mental health center, which targets mainly emotional disturbances and life adjustment issues, and there are no private counselors or clinical psychologists. In addition, although Macao has three institutes of higher education, none offer baccalaureate or graduate training or degrees in fields related to clinical psychology, counseling, psychiatric social work, or other mental health areas.

Based on research about attitudes toward mental illness among Chinese people, and knowledge about mental health services that are or are not available in Macao, the following hypotheses guided this study: (a) due to the stigma regarding mental illness and persons diagnosed as mentally ill in the Chinese culture, college students in Macao will report having less direct contact with individuals who have a mental illness than college students in the U.S.; (b) due to the dearth of mental health resources (educational and treatment) in Macao, college students from Macao will report being less knowledgeable about mental illness than college students in the U.S.; (c) college students from Macao will hold more negative attitudes toward mental illness and persons diagnosed as mentally ill than college students in the U.S.; (d) college students from Macao will be less willing to seek professional help for a mental health issue than college students in the U.S.; and (e) when needing help for a mental health issue, college students from Macao will be more likely to rely on themselves or their family, whereas college students in the U.S. will be more likely to utilize professional services such as psychotropic medications, counseling, or social work services.

Though the attitudes of the Chinese toward mental illness tend to be negative, they are not unchangeable. Within a context that provides education regarding and support for persons diagnosed with a mental illness, attitudes toward mental illness may become more positive. For example, Shokoohi-Yekta and Retish (1991) found that, relative to Chinese who had lived in the U.S. for a short period of time (i.e., < 2.9 years), Chinese who had lived in the U.S. for a longer time (i.e., > 2.9 years) held more positive attitudes toward mental illness. Fan (1999) observed similar acculturation effects in Australia. To assess such acculturation effects, the present study included a group of Macao students currently attending school in the U.S. We expected that, compared to students enrolled at a university in Macao, Macao students studying in the U.S. would hold more favorable attitudes toward mental illness and persons diagnosed as mentally ill.

Method

Participants

A total of 303 undergraduate students took part in the present study. We recruited participants from three different groups: students enrolled at a univer-
Students’ Attitudes  □  Sou and Irving

TABLE 1
Demographics of Sampled Groups

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Participant groups</th>
<th></th>
<th></th>
<th>Macao–U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>148</td>
<td>138</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>18.97 (M)</td>
<td>20.7 (SD)</td>
<td>20.59 (M)</td>
<td>2.94 (SD)</td>
</tr>
<tr>
<td>Years living in the U.S.</td>
<td>17.65 (M)</td>
<td>2.8 (SD)</td>
<td>16.12 (M)</td>
<td>3.46 (SD)</td>
</tr>
<tr>
<td>Years living in Macao</td>
<td>18.93 (M)</td>
<td>16.12 (M)</td>
<td>4.08 (SD)</td>
<td>3.46 (SD)</td>
</tr>
<tr>
<td>Number of months living in other countries a</td>
<td>2.30 (M)</td>
<td>12.43 (SD)</td>
<td>7.76 (M)</td>
<td>22.02 (SD)</td>
</tr>
</tbody>
</table>

Sex
- Men: 37 (25.0%) in the U.S., 62 (44.9%) in Macao, 11 (64.7%) in Macao–U.S.
- Place of birth
  - U.S.: 136 (91.9%)
  - Macao: 82 (59.4%) in Macao, 9 (52.9%) in Macao–U.S.

Ethnicity
- Caucasian: 128 (86.5%)
- Chinese: 130 (94.2%) in Macao, 17 (100%) in Macao–U.S.

Note. Values enclosed in parentheses represent percentages.

a Averages do not include individuals who have not lived in another country.
b One participant in this group did not respond to the item questions.
c The rest of the participants in these groups were predominately born in China or Hong Kong.

More students in the U.S. group (25% men) than in the Macao (44.9% men) and Macao–U.S. groups (64.7% men). The majority of the students in the U.S. group (91.9%) were born in the U.S.; however, only 59.4% of the Macao and 52.9% of the Macao–U.S. groups were born in Macao (many of the Macao and Macao–U.S. students were born in mainland China or Hong Kong, and these figures are generally consistent with the population of Macao). The majority of the U.S. students were Caucasian (86.5%), and, consistent with birth trends in the Macao population generally, most Macao and Macao–U.S. students were Chinese (94.2% and 100%, respectively).

Materials

The survey used in the present study was adapted from a study of Hong Kong people’s attitudes toward persons having a mental illness (Chou & Mak, 1998). We chose this measure because of the availability of Chinese- and English-language versions. The original survey contained 21 Likert-type items that examine people’s concerns about mental health (e.g., “I am very concerned about my mental health”), knowledge of mental illness (e.g., “Mental illness is infectious or contagious”), attitudes toward “mental patients” [sic] (e.g., “Mental patients are a burden to society”), and community-based care for individuals diagnosed with a mental illness (e.g., “Psychiatric rehabilitation facilities should be kept far from Hong Kong”).

The present study employed a modified version of the survey, which included the original 21 Likert-scale items, but replaced “Hong Kong” with “community” in those questions that asked about services available in the respondent’s community. Ratings for these 21 items are made on 5-point scales: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = totally agree. We also added two objective items to assess help-seeking behavior, and five objective questions to assess participants’ (a) amount of contact with people having a mental illness, (b) subjective level of knowledge about mental illness (i.e., how knowledgeable the participants think they are about mental illness), (c) perceptions of the importance of biology and environment in the etiology of mental illness (all above-mentioned items appear in Table 2), (d) source of extant knowledge about mental illness (Table 3), and (e) preference regarding whom to seek out for help with a mental health issue (Table 4). In addition to these questions, we
# TABLE 2

## Between-Group Analysis of Variance for Survey Responses

<table>
<thead>
<tr>
<th>Item</th>
<th>Participant groups</th>
<th></th>
<th></th>
<th></th>
<th>F</th>
<th>(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td></td>
<td>(df)</td>
<td></td>
</tr>
<tr>
<td><strong>Section 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Amount of contact with the mentally ill</td>
<td>2.56&lt;sub&gt;a&lt;/sub&gt;</td>
<td>1.40&lt;sub&gt;b&lt;/sub&gt;</td>
<td>1.76&lt;sub&gt;b&lt;/sub&gt;</td>
<td></td>
<td>49.1*</td>
<td>(2, 295)</td>
</tr>
<tr>
<td>2. Subjective level of knowledge about mental illness</td>
<td>2.24 (77)</td>
<td>2.12 (64)</td>
<td>2.18 (64)</td>
<td>1.0</td>
<td>(2, 300)</td>
<td></td>
</tr>
<tr>
<td>4. The importance of environment, as opposed to</td>
<td>2.60&lt;sub&gt;a&lt;/sub&gt;</td>
<td>3.48 (76)</td>
<td>3.53&lt;sub&gt;b&lt;/sub&gt;</td>
<td></td>
<td>39.2*</td>
<td>(2, 295)</td>
</tr>
<tr>
<td>biology, in the etiology of mental illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Section 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Concern for one’s physical health&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.45&lt;sub&gt;a&lt;/sub&gt;</td>
<td>3.90&lt;sub&gt;b&lt;/sub&gt;</td>
<td>4.06&lt;sub&gt;ab&lt;/sub&gt;</td>
<td></td>
<td>7.6</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>10. Concern for one’s mental health</td>
<td>2.89 (1.47)</td>
<td>3.84 (0.80)</td>
<td>3.94&lt;sub&gt;b&lt;/sub&gt; (1.03)</td>
<td></td>
<td>24.9*</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>11. Concern for family’s mental health</td>
<td>3.21&lt;sub&gt;a&lt;/sub&gt;</td>
<td>3.92&lt;sub&gt;b&lt;/sub&gt;</td>
<td>4.35&lt;sub&gt;b&lt;/sub&gt;</td>
<td></td>
<td>16.3*</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>12. Concern for community’s mental health</td>
<td>2.85&lt;sub&gt;a&lt;/sub&gt;</td>
<td>2.91&lt;sub&gt;b&lt;/sub&gt;</td>
<td>3.88 (0.78)</td>
<td>9.1</td>
<td>(2, 299)</td>
<td></td>
</tr>
<tr>
<td>13. Unwillingness to live near mental patients</td>
<td>2.67 (1.15)</td>
<td>3.43&lt;sub&gt;b&lt;/sub&gt; (0.84)</td>
<td>3.35&lt;sub&gt;b&lt;/sub&gt; (1.17)</td>
<td>20.5*</td>
<td>(2, 299)</td>
<td></td>
</tr>
<tr>
<td>14. Unwillingness to live near psychiatric rehabilitation facilities</td>
<td>2.98 (1.20)</td>
<td>3.23 (0.81)</td>
<td>3.24 (1.15)</td>
<td>2.1</td>
<td>(2, 299)</td>
<td></td>
</tr>
<tr>
<td>15. Belief that mental illness can be treated completely</td>
<td>2.49&lt;sub&gt;a&lt;/sub&gt;</td>
<td>3.45&lt;sub&gt;b&lt;/sub&gt; (0.82)</td>
<td>3.35&lt;sub&gt;b&lt;/sub&gt; (1.06)</td>
<td></td>
<td>40.9*</td>
<td>(2, 298)</td>
</tr>
<tr>
<td>16. Belief that mental illness is infectious</td>
<td>1.34&lt;sub&gt;a&lt;/sub&gt;</td>
<td>1.74 (0.88)</td>
<td>2.41&lt;sub&gt;b&lt;/sub&gt; (1.12)</td>
<td></td>
<td>17.4*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>17. Belief that mental illness is the same as “craziness”</td>
<td>1.63&lt;sub&gt;a&lt;/sub&gt;</td>
<td>2.29&lt;sub&gt;b&lt;/sub&gt; (0.93)</td>
<td>2.65&lt;sub&gt;b&lt;/sub&gt; (1.11)</td>
<td></td>
<td>22.8*</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>18. Belief that mental illness affects one’s whole life</td>
<td>3.70 (1.16)</td>
<td>2.95&lt;sub&gt;a&lt;/sub&gt; (0.94)</td>
<td>4.00&lt;sub&gt;b&lt;/sub&gt; (0.71)</td>
<td></td>
<td>21.6*</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>19. Belief that mental patients should only be kept in</td>
<td>2.01&lt;sub&gt;a&lt;/sub&gt;</td>
<td>2.65&lt;sub&gt;b&lt;/sub&gt; (0.87)</td>
<td>2.35&lt;sub&gt;b&lt;/sub&gt; (0.93)</td>
<td></td>
<td>20.9*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>psychiatric hospitals, but not other rehabilitative facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Belief that psychiatric rehabilitative facilities should be</td>
<td>2.07&lt;sub&gt;a&lt;/sub&gt;</td>
<td>2.76&lt;sub&gt;b&lt;/sub&gt; (0.79)</td>
<td>2.63&lt;sub&gt;ab&lt;/sub&gt; (0.96)</td>
<td></td>
<td>21.4*</td>
<td>(2, 298)</td>
</tr>
<tr>
<td>far from community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Belief that most mental patients are violent or</td>
<td>2.32&lt;sub&gt;ab&lt;/sub&gt; (0.89)</td>
<td>2.59&lt;sub&gt;b&lt;/sub&gt; (0.77)</td>
<td>1.88&lt;sub&gt;b&lt;/sub&gt; (0.70)</td>
<td></td>
<td>7.5*</td>
<td>(2, 300)</td>
</tr>
<tr>
<td>dangerous to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Belief that mental patients are troubles to society</td>
<td>2.28 (1.04)</td>
<td>2.95&lt;sub&gt;b&lt;/sub&gt; (0.77)</td>
<td>2.35&lt;sub&gt;b&lt;/sub&gt; (1.06)</td>
<td></td>
<td>19.3*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>23. Belief that mental patients should be kept in</td>
<td>2.74&lt;sub&gt;a&lt;/sub&gt; (1.13)</td>
<td>3.02 (0.91)</td>
<td>3.41&lt;sub&gt;c&lt;/sub&gt; (1.12)</td>
<td></td>
<td>4.9*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>psychiatric hospitals until they have completely recovered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Belief that psychiatric rehabilitative facilities should not</td>
<td>2.53&lt;sub&gt;a&lt;/sub&gt; (0.89)</td>
<td>2.94&lt;sub&gt;b&lt;/sub&gt; (0.68)</td>
<td>3.06&lt;sub&gt;ab&lt;/sub&gt; (0.75)</td>
<td></td>
<td>10.7*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>be built near another similar type of facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Belief that most people will somehow experience</td>
<td>3.09&lt;sub&gt;a&lt;/sub&gt; (1.00)</td>
<td>3.45&lt;sub&gt;b&lt;/sub&gt; (0.77)</td>
<td>4.18&lt;sub&gt;c&lt;/sub&gt; (0.73)</td>
<td></td>
<td>14.5*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>mental health problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Belief that mental patients are burden to society</td>
<td>1.96&lt;sub&gt;a&lt;/sub&gt; (0.95)</td>
<td>2.73&lt;sub&gt;b&lt;/sub&gt; (0.85)</td>
<td>2.18&lt;sub&gt;ab&lt;/sub&gt; (0.81)</td>
<td></td>
<td>26.4*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>27. Belief that the participant will never become a</td>
<td>3.15&lt;sub&gt;a&lt;/sub&gt; (1.05)</td>
<td>3.01 (0.95)</td>
<td>2.44&lt;sub&gt;c&lt;/sub&gt; (0.96)</td>
<td>3.8</td>
<td>(2, 297)</td>
<td></td>
</tr>
<tr>
<td>mental patient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Not being negative to mental patients as long as they are</td>
<td>3.82 (1.02)</td>
<td>3.73 (0.83)</td>
<td>3.71 (1.31)</td>
<td>0.3</td>
<td>(2, 299)</td>
<td></td>
</tr>
<tr>
<td>they do not cause any troubles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Belief that mental health is as important as physical health</td>
<td>4.54&lt;sub&gt;a&lt;/sub&gt; (0.77)</td>
<td>4.07&lt;sub&gt;b&lt;/sub&gt; (0.86)</td>
<td>4.56&lt;sub&gt;b&lt;/sub&gt; (0.63)</td>
<td></td>
<td>12.7*</td>
<td>(2, 298)</td>
</tr>
<tr>
<td>30. Willingness to seek professional help immediately for a</td>
<td>4.01&lt;sub&gt;a&lt;/sub&gt; (0.96)</td>
<td>3.47&lt;sub&gt;b&lt;/sub&gt; (0.76)</td>
<td>4.06&lt;sub&gt;ab&lt;/sub&gt; (0.90)</td>
<td></td>
<td>14.7*</td>
<td>(2, 299)</td>
</tr>
<tr>
<td>mental health problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Feeling ashamed to seek professional help with mental health</td>
<td>2.23&lt;sub&gt;a&lt;/sub&gt; (1.16)</td>
<td>2.69 (0.78)</td>
<td>1.94&lt;sub&gt;a&lt;/sub&gt; (1.09)</td>
<td></td>
<td>9.8*</td>
<td>(2, 299)</td>
</tr>
</tbody>
</table>

*Note.* Ratings for the items in Section 1 were made on 5-point scales ranging from 1 (no contact at all/not knowledgeable at all/biology) to 5 (constant contact/expert knowledge/environment). Ratings for items in Section 2 were made on a 5-point scale: 1 = totally disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = totally agree. For all items, means with different subscripts differ significantly at <i>p < .01</i> using the Tukey HSD post hoc comparison.

<sup>a</sup>Group means no longer differed when age was entered as a covariate.

<sup>*p < .01</sup>
added three open-ended questions to assess stereotypes about and knowledge regarding mental illness and individuals having a mental illness.

All new survey items were written in English by the authors and translated into Chinese by an acquaintance of the first author. The translator was a native Chinese speaker currently attending college in the U.S. The U.S. and Macao–U.S. groups received the English version of the survey, and the Macao group received the Chinese version. The Macao and Macao–U.S. participants received instructions to respond to the open-ended questions in the language of their choice (i.e., English or Chinese) in order to obtain linguistically rich responses.

The Macao–U.S. students completed the English version of the survey under the assumption that they were relatively proficient with the English language. We did not formally assess the English language proficiency of the Macao–U.S. participants; however, members of this group had received scores on the TOEFL (a standardized “Test of English as a Foreign Language” that assesses proficiency in reading and listening) that were sufficient to allow them to participate in the U.S. study-abroad program. Additionally, the majority of the Macao–U.S. students were of junior or senior standing, implying that they were proficient enough in English to succeed in upper division college courses.

**Procedure**

The U.S. sample consisted of students from an Introductory Psychology class in a state university lo-

### TABLE 3

| Source of information regarding mental illness | U.S. | Macao | Macao–U.S. | Column total
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass media, n (%)</td>
<td>25 (17.9)</td>
<td>114 (83.2)</td>
<td>10 (58.8)</td>
<td>149 (49.2)</td>
</tr>
<tr>
<td>Contact with people who are mentally ill, n (%)</td>
<td>43 (30.7)</td>
<td>7 (5.1)</td>
<td>1 (5.9)</td>
<td>51 (16.8)</td>
</tr>
<tr>
<td>Friends/family, n (%)</td>
<td>22 (15.7)</td>
<td>7 (5.1)</td>
<td>1 (5.9)</td>
<td>30 (9.9)</td>
</tr>
<tr>
<td>Classes, n (%)</td>
<td>42 (30.0)</td>
<td>2 (1.5)</td>
<td>5 (29.4)</td>
<td>49 (16.2)</td>
</tr>
<tr>
<td>Leisure reading materials, n (%)</td>
<td>8 (5.7)</td>
<td>7 (5.1)</td>
<td>0 (0)</td>
<td>15 (5.0)</td>
</tr>
</tbody>
</table>

**Note.** \( \chi^2(8) = 130.66, p < .001 \).

*Nine participants failed to respond.

### TABLE 4

| Person to seek help from for mental health problems | U.S. | Macao | Macao–U.S. | Column total
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Self, n (%)</td>
<td>12 (8.1)</td>
<td>7 (5.2)</td>
<td>2 (11.8)</td>
<td>21 (7.0)</td>
</tr>
<tr>
<td>Friends, n (%)</td>
<td>24 (16.2)</td>
<td>41 (36.6)</td>
<td>8 (47.1)</td>
<td>73 (24.4)</td>
</tr>
<tr>
<td>Family, n (%)</td>
<td>72 (48.6)</td>
<td>29 (21.6)</td>
<td>1 (5.9)</td>
<td>102 (34.1)</td>
</tr>
<tr>
<td>Physicians, n (%)</td>
<td>22 (14.9)</td>
<td>24 (17.9)</td>
<td>4 (23.5)</td>
<td>50 (16.7)</td>
</tr>
<tr>
<td>Counselors personnel, n (%)</td>
<td>17 (11.5)</td>
<td>27 (20.1)</td>
<td>1 (5.9)</td>
<td>45 (15.1)</td>
</tr>
<tr>
<td>Religious personnel, n (%)</td>
<td>1 (.7)</td>
<td>5 (3.7)</td>
<td>0 (0)</td>
<td>6 (2.0)</td>
</tr>
<tr>
<td>Others, n (%)</td>
<td>0 (0)</td>
<td>1 (.7)</td>
<td>1 (5.9)</td>
<td>2 (.7)</td>
</tr>
</tbody>
</table>

**Note.** \( \chi^2(12) = 47.35, p < .001 \).

*Four participants failed to respond.
cated in the Pacific Northwest. The U.S. students participated in the study to fulfill a research requirement for their Introductory Psychology class. The Macao sample consisted of students from a major university in Macao. Due to the difficulty of conducting a systematic sampling overseas, Macao participants were recruited by three acquaintances of the first author (hereafter referred to as “assistants”) who were students at the university from which this sample was obtained. The first author provided assistants with verbal instruction to recruit their classmates and acquaintances at school and to administer surveys to these Macao participants. For the convenience of administration, the participants had the option to finish the survey at home or immediately after they received it. Once completed, participants returned the surveys by hand to the assistant who had administered the survey to them. After collecting the completed surveys, the assistants mailed them to the first author.

The Macao–U.S. sample consisted of international students from Macao attending college in the U.S. at the time of data collection. These students were identified and invited to participate by acquaintances of the first author who were also international students from Macao. The Macao–U.S. participants received the survey by mail; once completed, participants mailed the surveys to the second author at Washington State University at Vancouver in a stamped, addressed envelope.

Before completing the survey, participants read a cover letter that explained the nature of the study and ensured voluntary participation and confidentiality. The participants also received the researchers’ contact information should they have questions, comments, or concerns after completing the survey. Once the participants finished the survey, each of them received a debriefing sheet that explained the purpose of the study and provided basic information regarding mental illness and how to seek help for a mental health issue.

Results

One-way analyses of variance (ANOVAs) examined between-group differences in responses to objective survey items (we did not analyze open-ended questions because approximately half of Macao students did not respond to these questions). Significant ANOVAs (alpha = .01) were followed by Tukey honestly significant difference (HSD) post hoc comparisons, with a p level of .01. See Table 2 for group means, F values, and HSD comparison results.

Consistent with predictions, the U.S. group reported significantly more contact with individuals having a mental illness than did the Macao and Macao–U.S. groups (Q. 1: Item 1 in Table 2). On the 5-point continuum representing the importance of biology and environment in the etiology of mental illness (1 = biology to 5 = environment), both Macao and Macao–U.S. groups placed more importance on environmental than biological causes than did the U.S. group (Q. 4). Contrary to predictions, the groups did not differ in their subjective level of knowledge about mental illness (Q. 2).

Compared to the U.S. group, the Macao group was more concerned about their physical and mental health (Q. 9 and Q. 10), and also was less willing to live near persons with a mental illness (Q. 13). Compared to the U.S. group, the Macao group was more likely to believe that mental illness is “infectious” (Q. 16), that mental illness is the same as “craziness” (Q. 17), and that mental illness affects one’s whole life (Q. 18). The Macao group also was more likely to believe that people with a mental illness should be kept in psychiatric rather than rehabilitative facilities (Q. 19), that they should be kept in psychiatric hospitals until they have recovered completely (Q. 23), and that psychiatric rehabilitative facilities should be located far from the community (Q. 20). Compared with the U.S., the Macao group was more likely to believe that most people with a mental illness are violent or dangerous (Q. 21), troublesome (Q. 22), and a burden to society (Q. 26). Interestingly, the Macao group was more likely than the U.S. group to believe that mental illness can be treated completely (Q. 15).

The Macao group was more likely than the U.S. group to believe that most people will experience a mental health problem (Q. 25); however, the groups were similar in their belief about whether the respondent him/herself would ever become a mental patient (i.e., would develop a mental disorder and experience its symptoms; Q. 27). Finally, compared to the U.S., the Macao group was less willing and more ashamed to seek professional help for a mental health issue (Q. 30, Q. 31).

For most items, the responses of the Macao–U.S. group fell between those of the Macao and U.S. groups. Exceptions to this pattern were Q. 16 (the belief that mental illness is infectious) and Q. 25 (the belief that most people will somehow experience mental health problems); in both of these cases, the Macao–U.S. group expressed stronger agreement with the items than either the Macao or U.S. group.

Because the U.S. group differed from the Macao and Macao–U.S. groups on age and sex composition (i.e., the U.S. students were younger and predominately women), we repeated all of the analyses with age as a covariate and sex (men, women) as a second categorical independent variable. Covarying the ef-
effects of age eliminated only one significant finding; there were no longer any cultural group differences on “concern for one’s physical health” (Q. 9). All other group differences remained significant. There was one main effect for sex; women were more willing than men to live near people with a mental illness (Q. 13), \( F(1, 292) = 7.32, p < .01 \).

Chi-square tests analyzed participants’ primary source of information about mental illness (Table 3), and the person from whom participants would first seek help for a mental health issue. Among the U.S. group, 31% stated that contact with an individual who has a mental illness was the major source of their knowledge about mental illness, followed by educational classes (30%), mass media (18%), friends and family (16%), and leisure reading materials (5.7%). Of those participants in the Macao group, 85% received most of their information from mass media, 5.1% from contact with persons having a mental illness, friends and family, and leisure reading materials, and 1.5% from educational classes. Finally, 59% of the Macao–U.S. group received information about mental illness from mass media, 29% from educational classes, and 5.9% from contact with persons having a mental illness and friends and family. There were significant group differences in the most important source of information about mental illness, \( \chi^2(8) = 130.66, p < .001 \) (Table 3).

Regarding help-seeking behavior, among those participants in the U.S. group, 49% reported “family” as the first person(s) from whom to seek help for a mental health issue, 16% reported friends, 15% physicians, 11% counselors, 8.1% self, and .7% religious personnel. Among the Macao students, 37% would first seek help from friends, 22% from family, 20% from counselors, 18% from physicians, 5.2% from self, 3.7% from religious personnel, and .7% from other persons. Finally, 47% of Macao–U.S. participants would first seek help from friends, 23% from physicians, 12% from self, and 5.9% each from family, counselors, and other persons. No one in the Macao–U.S. group reported that they would seek help from religious personnel. There were significant group differences regarding persons from whom one would seek help for a mental health issue, \( \chi^2(12) = 47.35, p < .001 \) (Table 4).

We examined the effect of acculturation on attitudes toward mental illness by tallying and comparing the number of significant group differences observed between the U.S. and Macao groups, between the U.S. and Macao–U.S. groups, and between the Macao and Macao–U.S. groups. An acculturation effect would be indicated if the number of significant differences between the Macao and U.S. groups (i.e., the most culturally “distinct” groups) were larger than the number of significant differences between the Macao–U.S. and U.S. participant groups, and if the number of significant differences between the Macao and Macao–U.S. participant groups was similar to the number of significant differences between the U.S. and Macao–U.S. groups. Out of 23 analyses (see Section 2 in Table 2), the Macao and U.S. participant groups differed significantly on 16 items; however, the Macao–U.S. and U.S. participant groups differed significantly on only 7 items, and the Macao–U.S. and Macao participant groups differed significantly on 6 items (Table 5). This pattern of results suggests the presence of an acculturation effect.

### Discussion

Results provide mixed support for the hypotheses. Consistent with predictions, compared to the U.S. students, the Macao students had less contact with, and more negative attitudes toward, people having a mental illness. Additionally, the Macao students were more ashamed about and less willing to seek professional help for a mental health issue. Contrary to predictions, the Macao students were not more likely than the U.S. students to rely on self-help in dealing with mental health problems. Consistent with predictions, the Macao–U.S. students had attitude scores regarding mental illness that were in between those of the U.S. and Macao students, suggesting that exposure to different cultural beliefs regarding mental illness may have influenced their attitudes (i.e., acculturation).

As predicted, compared to the U.S. students, the Macao students reported significantly less contact with people diagnosed as mentally ill. The Chinese assign great importance to restraining intense emotions and to “saving face” (i.e., avoiding public humiliation). For this reason, individuals and families in Macao may

### TABLE 5

<table>
<thead>
<tr>
<th>Number of Significantly Different Responses Among Groups</th>
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<tr>
<td><strong>Groups</strong></td>
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<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>U.S.</td>
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<tr>
<td>Macao</td>
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<tr>
<td>Macao–U.S.</td>
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*Note. A total of 26 items were included in the analysis.*
hide a family member’s mental illness from others. Consequently, the public may have infrequent contact with individuals “known” to have a mental illness. Unfortunately, a lack of exposure to individuals diagnosed as mentally ill does not provide Macao residents with an opportunity to challenge misconceptions and stereotypes that they may have about mental illness and persons diagnosed as mentally ill.

Our prediction that the Macao students would hold more negative attitudes toward mental illness than the U.S. students was supported. The survey contained 11 items that address stigma regarding mental illness. Compared to the U.S., the Macao group agreed more strongly with (i.e., had more negative attitudes regarding) 7 of these items. Together, responses to these items indicate that the Macao students were more likely to view individuals with a mental illness as a burden to society, and to believe that treatment should involve being socially restricted and housed at a remote facility.

Interestingly, the Macao and U.S. students were similar in their personal willingness to live near a psychiatric rehabilitation facility, and in their belief that people diagnosed as mentally ill could be violent. This result stands in contrast to the finding that, compared to European Americans, Asians perceive individuals with a mental illness as more dangerous (Whaley, 1997). It is possible that the lack of cross-cultural differences in the perception of dangerousness is due to recent high-profile crimes in the U.S. committed by individuals diagnosed as mentally ill (e.g., Russell Weston, diagnosed with schizophrenia, shot and killed two officers in the U.S. Capitol Building; Pizello, 1998). Indeed, Angermeyer and Matschinger (1996) found that media reports of attacks by persons diagnosed as mentally ill increase the public’s belief that people with mental illness are dangerous and unpredictable.

We observed a contradictory pattern of results on items that assessed help-seeking behavior. Responses to Likert-type items confirmed our hypothesis that the Macao students would be less willing than the U.S. students to seek professional help for a mental health problem. Compared to the U.S. students, the Macao students were less willing to immediately seek professional help for a mental health problem, and more ashamed to seek professional help for a mental health problem. Contrary to predictions, however, the Macao students were not more likely than the U.S. students to rely on self-help or family support when dealing with a mental health problem. Only 5% of the Macao students (compared to 8% of the U.S. students) indicated that self-help would be their first choice if faced with a mental health problem; more common first choices among the Macao students were friends (37%), family (22%), counselors (20%), and physicians (15%). Among the U.S. students, nearly half (49%) reported that they would first seek help from family, followed by friends (16%), physicians (15%), and counselors (11%).

Our findings regarding help-seeking behavior contradict previous research, which indicates that Chinese are more likely than European Americans to rely on self-help measures. We speculate that our discrepant findings are related to how “help-seeking” questions were worded in the survey used in the present study. In the present study, help-seeking items assessed willingness to seek help for a generic “mental health problem”; these items did not assess participants’ willingness to seek help for different levels (e.g., chronic vs. acute) or types (e.g., schizophrenia vs. acute stress reaction) of mental health problems. This generic language does not take into account that help-seeking behavior is influenced by the type of mental health problem an individual faces (Boey, 1999).

Because of the generic wording of these items, participants may have responded according to their unique definition of “mental health problem.” The Macao students, who were more likely than the U.S. students to equate mental illness with “craziness,” may have reflected on a chronic mental illness such as schizophrenia. The U.S. students, on the other hand, may have reflected on a more acute mental health problem (e.g., reaction to a trauma or stressor). With a chronic mental illness in mind, the Macao students may have opted to seek professional help rather than seek help from friends and family. This same image of a “chronic mental illness” may have increased the Macao students’ sense of shame about and resistance to needing professional help. We attempted to clarify participants’ understanding of “mental health problems” by adding three open-ended questions in the survey that assessed participants’ stereotypes of an individual with a mental illness. However, because approximately half of the Macao students did not respond to these open-ended questions, we were unable to use these items to help interpret our findings. For a clearer understanding of cultural differences in willingness to seek professional help, future research should ask about willingness to seek help for different types of mental health problems. Researchers must also understand how the culture under observation defines “mental illness” and what it means to be “mentally ill.” If a culture does not believe that certain symptoms or behaviors reflect a mental disorder, people in this culture may not seek help for these symptoms and behaviors. Hence,
findings associated with help-seeking behavior will be influenced by a culture’s definition of mental illness.

Macao’s mental health system is poorly developed; there is little community mental health care, no baccalaureate or graduate training in counseling or mental health, and no infrastructure in place to advocate for the mentally ill. For this reason, we predicted that the Macao students would report lower levels of knowledge about mental illness than the U.S. students. Contrary to this prediction, the Macao and U.S. students reported having a similar amount of knowledge about mental illness. This puzzling result may be due to how knowledge was assessed on the survey. Respondents evaluated their subjective level of knowledge about mental illness, but not objective knowledge (e.g., factual knowledge about mental illness). However, the fact that the Macao students were more likely than the U.S. students to believe that mental illness is infectious and synonymous with “craziness” suggests that the Macao students were less knowledgeable about mental illness.

The study included the Macao–U.S. group in order to examine the effects of acculturation on attitudes toward persons diagnosed as mentally ill. Inferential analyses indicated that, compared to the Macao students, the Macao–U.S. students held more positive attitudes (i.e., closer to the Americans’ attitudes) toward mental illness. Two specific findings are worth noting here. Compared to the Macao group, the Macao–U.S. group was significantly less likely to believe that most mental patients are violent or dangerous to others, and less likely to report feeling ashamed to seek professional help for a mental health problem. These group differences have important practical implications for at least two reasons. First, the (inaccurate) belief that all mentally ill persons are dangerous is the most important predictor of public attitudes that support social restrictions of, and socially remote facilities for, people with mental illness (Corrigan, 2000). Second, shame associated with help seeking is the major reason for underutilization of mental health services by the Chinese (Boey, 1999). Group differences between the Macao and Macao–U.S. students on these items suggest that negative attitudes toward mental illness and its treatment may change in a social milieu that encourages more positive attitudes and policies regarding mental illness and individuals diagnosed as mentally ill.

Although these results are suggestive of acculturation effects, this study did not explore the process by which acculturation might have occurred. One possible mechanism, however, is education. Twenty-nine percent of the Macao–U.S. students, in contrast to 1.5% of the Macao students, reported that educational classes had been their most important source of information about mental illness. Education about mental illness is one of the most promising methods for reducing stigma regarding mental illness (Penn & Martin, 1998). Education about mental illness may account for the more positive attitudes that the Macao–U.S. students held toward persons with mental illness. Whereas moving to a country that holds more progressive attitudes (i.e., encouraging “acculturation”) is an imprudent strategy for changing attitudes toward mental illness, successful education programs are transferable, and can be modified to meet the needs of specific cultural groups (Corrigan & Penn, 1999; Penn et al., 1994; Penn & Martin, 1998).

Findings of the present study must be evaluated with additional limitations in mind. First, we selected our survey because of the availability of Chinese- and English-language versions. However, to our knowledge, research has not established the consistency of the Chinese and English versions. Moreover, the survey items created for this study did not receive a backward translation to ensure reliability between the Chinese and English versions; therefore, group differences may be due to inherent differences in the meaning of survey items after translation.

A second limitation is that our “acculturation” interpretation is based on the assumption that the Macao–U.S. and Macao students had similar attitudes before the Macao–U.S. students left for the U.S. However, these attitudinal differences may have existed before the Macao–U.S. students traveled to the U.S. People who can afford to study abroad are generally higher in socioeconomic status (SES); therefore, group differences may be attributable to SES rather than acculturation. In future research, more participant background information should be collected to ensure that groups are comparable on relevant characteristics such as SES. Third and finally, the Macao–U.S. sample was small and recruitment was nonrandom. Consequently, the findings related to this sample should be interpreted with caution.

Given the connection between public attitudes toward mental illness and treatment of individuals diagnosed as mentally ill, research on cross-cultural and ethnic group differences in attitudes toward mental illness is useful for developing more appropriate mental health education programs and services for people diagnosed as mentally ill and their families (Shokoohi-Yekta & Retish, 1991). In the present study, for example, compared to the U.S. students, the Macao students reported more negative attitudes toward mental illness and those diagnosed as mentally ill. Compared to the Macao students, however,
the Macao–U.S. students held more positive attitudes toward mental illness, suggesting that negative stereotypes about mental illness can change in a context that encourages positive attitudes and policies regarding mental illness and people with mental illness. Future research is needed to address the limitations of the present study, and (thereby) to replicate and validate our results. If our findings are supported, it may be helpful to more formally evaluate the need for education programs to improve attitudes, social support, and treatment options available for individuals diagnosed as mentally ill in Macao.

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Impact of Different Social Models on Young Adults’ Views of Marriage and Divorce

In this study we examined the potential influence of multiple relationship models on young adults’ attitudes regarding marriage and divorce. College students (n = 110; 62% women, mean age = 19.1) completed measures of marriage and divorce attitudes and described conflict and happiness of 3 couples (parents, positive marriage model, and negative marriage model). Parent and positive model characteristics were significantly correlated with marriage attitudes such that respondents describing parental and positive models that were low on conflict and high on happiness reported more positive marriage attitudes. In multiple regression analyses, only positive model happiness predicted marriage attitudes; no variables predicted divorce attitudes. Findings suggest the potential role of nonparental models in shaping young adults’ attitudes toward marriage and divorce.

This study explored how different relationship models might shape attitudes and beliefs regarding marriage. An extensive body of research (reviewed below) has assessed the effects of parental marital dissolution and the perceived happiness of their relationship on children’s desire to marry. This research has confirmed that young adults’ attitudes toward marriage and divorce are influenced by parental models. However, parents are unlikely to be the only relationship model for most individuals. To date, no research has investigated the influence of nonparental relationship models on the formation of marriage and divorce attitudes. This study was designed to begin to fill that gap.

In nuclear families characteristic of U.S. society, parents typically provide children with the earliest model of a marital relationship. According to social learning theory, children develop response patterns that guide their attitude formation as well as their later behavior through processes that include observational learning and modeling (Bandura, 1971). Research supports the notion that the family of origin constitutes a primary setting for children to learn marital roles and values. Individuals who grow up observing a positive parental marriage are likely to develop positive marital attitudes (Hill & Aldous, 1969). Conversely, young adults with a family history of divorce may see divorce as a possible option in dealing with discord in a marriage of their own (Greenberg & Nay, 1982).

Numerous studies have documented the impact of parental marital models on young adults’ attitudes toward marriage and divorce. For example, young adults with divorced parents endorsed significantly more negative statements about the future success of their own marriage, and the institution in general, than young adults from intact families (Gabardi & Rosén, 1991). Similarly, young adults who had experienced parental divorce were more likely to opt for cohabitation without plans of subsequent marriage rather than for marriage without preceding cohabitation (Liefbroer & de Jong Gierveld, 1993). Finally, young adults whose parents were divorced thought that control in their ideal family environment would be less achievable than did young adults from intact families (Carson & Pauly, 1990).

Author note. The authors thank Heidi Inderbitzen-Nolan, who served on the first author’s honors thesis committee, and Paul Amato, who read a draft of the manuscript. The second author acknowledges the support of the University of Nebraska Research Council. Address for correspondence: Marcela Raffaelli, Department of Psychology and Institute for Ethnic Studies, 238 Burnett Hall, University of Nebraska, Lincoln, NE 68588-0308. Electronic mail may be sent to: mraffaelli1@unl.edu.
Thus, the empirical literature supports the notion that parental divorce is linked to young adults’ views of marriage and divorce.

Researchers have also examined the impact of parental discord on attitudes toward marriage and divorce. Various studies have revealed that marital status alone was not a significant predictor of attitudes; instead, the amount of conflict in the parents’ marriage affected individuals’ views of marriage. Young adults who observed an unhappy, conflicted parental marriage had less positive views of marriage and were more cautious in their own marital aspirations (e.g., Gabardi & Rosén, 1991; Jennings, Salts, & Smith, 1991; Willetts-Bloom & Nock, 1992). Exposure to parental divorce and family conflict is also associated with more favorable views toward divorce (Amato & Booth, 1991). These results support the notion that the parents’ level of marital conflict may be as important as their marital status in predicting college students’ attitudes toward marriage. As Kinnaird and Gerrard (1986) concluded, both “disruption and conflict in one’s family of origin may result in a sceptical or apprehensive view of marriage” (p. 764).

It is clear that family of origin characteristics are related to individuals’ views of marriage and divorce. In addition, scholars have speculated that other relationship models may also shape young adults’ attitudes toward marriage and divorce. For example, Greenberg and Nay (1982) suggested that “in the event that the child is exposed to maladaptive models, he may seek out alternative role models . . .” (p. 344). No published research on how nonparental relationship models affect views of marriage and divorce exists. However, there is evidence of the importance of nonparental models in other areas of children’s and adolescents’ lives.

Important nonparental relationships include peers, siblings, and related and unrelated adults (Furman & Buhrmester, 1992). Peers are significant influences on adolescent attitudes and behaviors related to romantic and sexual issues (e.g., Perry, Kelder & Komro, 1993; Savin-Williams & Berndt, 1990); they also influence health beliefs and behaviors in college students (Lau, Quadrel, & Hartman, 1990). The sibling relationship involves constancy and intensity (Bank & Kahn, 1982; Lamb & Sutton-Smith, 1982), and it is likely that “siblings have an important role in shaping expectations and patterns of intimacy” (Bedford, 1989; p. 12). Although sibling relationships are most intense during early childhood, their emotional attachment remains moderately strong throughout adolescence (Buhrmester & Furman, 1990). Finally, related and nonrelated adults (e.g., grandparents, teachers, family friends) represent potentially significant relationship models. For example, the majority of young adults in one study reported that grandparents were a significant influence, with positive impact on their values, goals, and life choices (Franks, Hughes, Phelps, & Williams, 1993; see also Kennedy, 1992). These various lines of research suggest that nonparental relationships affect individuals’ beliefs and actions. Therefore, we speculated that nonparental relationships might be important in shaping attitudes regarding marriage and divorce.

In sum, research has revealed linkages between parental conflict and marital status and young adults’ attitudes toward marriage and divorce, but the possible impact of other marital models has not been studied. The present study had three main goals. The first goal was to describe nonparental relationship models that potentially influence the formation of attitudes regarding marriage and divorce, and compare the characteristics of these models with parents, the usual focus of marital attitudes research. The second goal was to examine how characteristics of different relationship models were related to young adults’ attitudes regarding marriage and divorce. We hypothesized that higher levels of conflict, lower levels of happiness, and divorce in the three marital models would be linked to less positive views of marriage and more positive views of divorce. The third goal was to examine the combined impact of nonparental models on young adults’ views regarding marriage and divorce. We hypothesized that nonparental marital models would have an effect on young adults’ views of marriage and divorce above and beyond that of parents.

Method

Participants and Procedures

Participants were 110 college students (42 men and 68 women) enrolled in an Introductory Psychology course at a midwestern public university. Students ranged in age from 17–26 (M = 19.06, SD = 1.42). Reflecting the population of the state and the university, most participants (94.5%) were Caucasian.

Participants signed up for the study on posted sign-up sheets and attended group survey administration sessions. After providing informed consent, participants filled out self-report questionnaires. They then completed a debriefing session and were given the opportunity to ask questions. Participants received course credit for completing the study.

Measures

The questionnaires assessed demographic variables, attitudes toward marriage and divorce, and characteristics of parental and nonparental marital models.
Attitudes toward divorce. Participants completed nine items adapted from two existing measures. The combined scale included the six-item Total Divorce Scale (Amato & Booth, 1991) and three items from the Attitudes Toward Divorce Scale (Kinnaird & Gerrard, 1986; sample items include “The personal happiness of an individual is more important than putting up with a bad marriage”; “Couples are able to get divorced too easily these days”; “The marriage vow ‘till death do us part’ represents a sacred commitment to another person and should not be taken lightly”). The 4-point response scale ranged from strongly agree (1) to strongly disagree (4). An overall Attitudes Toward Divorce score was derived for each participant by averaging across items; a higher score indicated a more “prodiveorce” attitude.

Attitudes toward marriage. Participants completed an adapted version of the Attitudes Toward Marriage Scale (Wallin, 1954) consisting of 10 items (sample items include, “If I marry, I will not miss the life I have had as a single person”; “If I marry, it will be very difficult for me to adjust to married life”). The 4-point response scale ranged from strongly agree (1) to strongly disagree (4). An overall score was derived for each participant by averaging across items; a higher score indicated a more positive view of marriage.

Happiness and conflict in parental and nonparental models of marriage. Participants completed the same measures of happiness and conflict (pre- and postdivorce, if the couple was divorced) for the three relationship models. First, participants provided information about their parents. They were then told to select a couple other than parents who “affected your views of marriage in a positive way,” and a couple other than parents who “affected your attitudes of marriage in a negative way.”

A single item from the Dyadic Adjustment Scale (Spanier, 1976) assessed each couple’s happiness on a 7-point scale from extremely unhappy (0) to happy (3) to perfect (6). Respondents were told that the midpoint represented “the degree of happiness in most relationships” and were instructed to “circle the [number] which best describes the degree of happiness, all things considered, of [the couple’s] relationship” (p. 28). This single item correlates highly with the entire 32-item scale (r = .73 and .67) and differentiates between couples rated as “adjusted” and “distressed” (Goodwin, 1992).

We developed a three-item Conflict Scale. The scale incorporated different levels of conflict escalation, and was similar to measures used in prior research (e.g., Gabardi & Rosén, 1992; Jennings et al., 1991). The items were: “How often did [model] argue (fight, get upset with one another)?”; and “How often did [model] yell or scream at one another (more violent argument)?” Each item was rated on a 5-point scale ranging from never (1) to always (5), and the items were averaged to form an overall conflict score.

Demographic information. Demographic information about each relationship model was also obtained. Demographic variables included age relative to respondent and marital status. In addition, for nonparental models, participants reported on their relationship (e.g., relative vs. nonrelative) and rated how well they knew the couple on a 5-point scale ranging from extremely well (1) to somewhat (3) to hardly knew them (5). This information was used in descriptive analyses.

Results

Descriptive Analyses

To address the first goal of the study, descriptive statistics were computed for the three relationship models, mean levels of happiness and conflict in the three models compared, and intercorrelations among ratings of the three models computed.

Parents. The majority of participants reported that their parents were still married (70.9%); 13.6% had divorced and remarried, and 9.1% were divorced. As shown in Table 1, on average young adults saw their parents’ marriage as “happy” while they were growing up, representing the degree of happiness in most relationships. The average level of parental conflict while the young adult was growing up was between “seldom” and “sometimes.”

Positive marital model. When asked to select a positive model of marriage (other than parents), half of the respondents selected relatives and half selected nonrelatives. For those models who were relatives, nearly half (49%) were aunts and uncles; the remainder were grandparents (31%), siblings (14.5%), or cousins (5.5%). Over half of the nonrelative models were friends near the respondents’ parents’ age (58%); the remainder were neighbors (13%), friends near the respondents’ age (9%), teachers or coaches (7%), or other nonrelatives (13%). Of these 110 positive models, only 3 were divorced. On average, the young adults felt they knew the positive model between “extremely” and “fairly” well (M = 1.73, SD = .69). As shown in Table 1, respondents rated the positive model couple as “very happy,” and the average conflict rating was “seldom.”

Negative marital model. When asked to describe a negative marital model, about half (50.9%; n = 56) of the respondents selected relatives, whereas the remaining participants (49.1%; n = 54) selected
nonrelatives. For those models who were relatives, two thirds (65%) were aunts and uncles; the remainder were grandparents (17.5%), siblings (3.5%), cousins (10.5%), or other relatives (3.5%). About half of the nonrelative models were friends near the respondents’ parents’ age (53%); the remainder were neighbors (17%), friends near the respondents’ age (17%), teachers or coaches (2%), or other nonrelatives (11%). About two thirds (64.5%) of these negative models were divorced, and 35.5% had remained married. On average, the young adults felt they knew the negative model “fairly well” (M = 2.37, SD = .89). The average rating of happiness in negative models while married was “a little unhappy,” and the average level of conflict was between “sometimes” and “often” (Table 1).

**Comparisons of relationship models.** Multivariate analyses of variance (MANOVAs) examined levels of conflict and happiness in the three relationship models. In the first MANOVA, conflict in each of the three relationships (parental, negative, and positive model) was the between-subject factor. The overall comparison was significant, F(2, 216) = 113.10, p < .0001. Follow-up univariate F tests revealed that negative models received the highest conflict ratings, followed by parents, with positive models receiving the lowest conflict ratings (see Table 1 for Ms and SDs).

In the second MANOVA, happiness in each of the three relationships (parental, negative, and positive model) was the between-subject factor. Again, group differences were significant, F(2, 214) = 132.09, p < .0001. Follow-up univariate F tests revealed that positive models received the highest marital happiness ratings, followed by parents, with negative models receiving the lowest ratings (see Table 1).

Pearson’s correlation coefficients examined intercorrelations among the study variables (see Table 2). In all three relationship models, conflict and happiness were significantly, negatively related. In addition, for parents but not negative models, being divorced or separated was associated with higher levels of conflict, and lower levels of happiness, prior to the divorce. Few other significant correlations among study variables emerged, suggesting that multicollinearity was not a problem. That is, the study variables were not so highly intercorrelated that entering them separately in the analyses would violate statistical assumptions of independence.

**Impact of Relationship Models on Views of Marriage and Divorce**

The next set of analyses examined the hypothesis that conflict, unhappiness, and marital dissolution in the three relationship models would be linked to less positive views of marriage and more positive
views of divorce. As shown in the last two lines of Table 2, no correlations between marriage attitudes and negative model characteristics emerged, but lower levels of parental and positive model conflict and higher levels of parental and positive model happiness were related to more positive marriage attitudes. In addition, parental marital status was marginally (p < .06) related to marriage attitudes such that respondents whose parents were divorced reported less positive views of marriage. In contrast, divorce attitudes were not linked to characteristics of any of the models, although there was a near-significant (p < .06) negative correlation between negative model happiness and divorce attitudes.

**Combined Influence of Marital Models on Marriage and Divorce Attitudes**

The combined effects of the three models on young adults’ attitudes toward marriage was examined using hierarchical multiple regression analysis. To test the hypothesis that nonparental marital models would have an effect on young adults’ views of marriage and divorce above and beyond that of parents, variables were entered in three steps: parental model (happiness, conflict, and marital status), negative model (happiness, conflict, and marital status), and positive model (happiness and conflict).

As shown in Table 3, at the first step the parental model was a near-significant predictor of attitudes toward marriage, $F_{change} (8, 98) = 2.56$, $p = .06$ ($R^2 = .07$), although the individual coefficients were not significant. As conflict increased with divorce or separation, attitudes toward marriage were less positive. On the second step, the addition of the negative model did not produce a significant change in $R^2$ ($R^2_{change} = .0065$) and no factors of this model were significant predictors of attitudes toward marriage, $F_{change} (8, 98) = .23$, $p = .87$. At the third step, there was a significant change in $R^2$ ($R^2_{change} = .13$) such that positive model happiness and conflict levels were significant predictors of attitudes toward marriage, $F_{change} (8, 98) = 7.66$, $p = .0008$ (multiple $R^2 = .20$). For the overall model predicting attitudes toward marriage, positive model marital happiness was the only significant predictor of marital attitudes of young adults, $F(8, 98) = 3.08$, $p = .0039$. In a similar hierarchical regression analysis with divorce attitudes as the outcome variable, none of the three marital models (parental, positive, negative) emerged as significant predictors either individually (each step) or overall, $F(8, 98) = .985$, $p = .45$ (see Table 4).

**Discussion**

Research has revealed linkages between parental characteristics and young adults’ views toward marriage and divorce. The present study extended prior research by asking young adults to provide parallel information about three couples: their parents, a couple that had affected their views of marriage in a positive way, and a couple that had affected their views of marriage in a negative way. This information allowed us to explore the potential role of nonparental marital models on attitudes toward marriage and divorce.
The first goal of the study was to describe nonparental relationship models that potentially influence the formation of attitudes regarding marriage and divorce, and to compare the characteristics of these models with parents. All participants were able to identify positive and negative models of marriage, suggesting that nonparental models are a readily available source of information for young adults. Additionally, descriptive analyses revealed overall differences in ratings of happiness and conflict, and in marital status, for the positive and negative models. Conflict and happiness ratings suggest that most individuals can think of examples of positive and negative marriages that are more extreme than their own parents’ marriage. These findings highlight the need for additional research on the role of nonparental models in shaping young adults’ attitudes regarding marriage.

The second goal was to examine how characteristics of different relationship models were related to young adults’ attitudes regarding marriage and divorce. The hypothesis that conflict, unhappiness, and marital disruption in the models of marriage would be linked to less positive views of marriage and more positive views of divorce was partially supported. No consistent linkages between divorce attitudes and characteristics of parental models or positive models emerged, although there was a near-significant correlation such that as negative model happiness decreased, respondents viewed divorce as a more acceptable option. As expected, young adults who reported higher levels of parental and positive model happiness, lower levels of parental and positive model conflict, and intact parental marriages tended to have more positive attitudes toward marriage. However, negative marital model characteristics were not linked to marriage attitudes.

The linkages between characteristics of the parental relationship and young adult attitudes that emerged in this study are consistent with prior research. Individuals who grow up in homes with high degrees of conflict and turmoil are typically found to have more cautious attitudes toward, and a less positive outlook on, marriage (Jennings et al., 1991; Kinnaird & Gerrard, 1986; Willetts-Bloom & Nock, 1992). The current study extended this research by suggesting that nonparental models may also be involved in shaping attitudes toward marriage. In fact, the correlations between conflict and happiness in the positive model and marriage attitudes equaled or exceeded those for parental models, highlighting the need for further research on this topic.

The lack of significant relations between parental factors and divorce attitudes is contrary to prior research (e.g., Amato & Booth, 1991; Greenberg & Nay, 1982). Our findings are unlikely to be the result

| TABLE 3 |
| Results of the Hierarchical Multiple Regression on Attitudes Toward Marriage |

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Note. Marital status coded as not divorced = 0, divorced/separated = 1.
***$p < .01$. 

The first goal of the study was to describe nonparental relationship models that potentially influence the formation of attitudes regarding marriage and divorce, and to compare the characteristics of these models with parents. All participants were able to identify positive and negative models of marriage, suggesting that nonparental models are a readily available source of information for young adults. Additionally, descriptive analyses revealed overall differences in ratings of happiness and conflict, and in marital status, for the positive and negative models. Conflict and happiness ratings suggest that most individuals can think of examples of positive and negative marriages that are more extreme than their own parents’ marriage. These findings highlight the need for additional research on the role of nonparental models in shaping young adults’ attitudes regarding marriage.

The second goal was to examine how characteristics of different relationship models were related to young adults’ attitudes regarding marriage and divorce. The hypothesis that conflict, unhappiness, and marital disruption in the models of marriage would be linked to less positive views of marriage and more positive views of divorce was partially supported. No consistent linkages between divorce attitudes and characteristics of parental models or positive models emerged, although there was a near-significant correlation such that as negative model happiness decreased, respondents viewed divorce as a more acceptable option. As expected, young adults who reported higher levels of parental and positive model happiness, lower levels of parental and positive model conflict, and intact parental marriages tended to have more positive attitudes toward marriage. However, negative marital model characteristics were not linked to marriage attitudes.

The linkages between characteristics of the parental relationship and young adult attitudes that emerged in this study are consistent with prior research. Individuals who grow up in homes with high degrees of conflict and turmoil are typically found to have more cautious attitudes toward, and a less positive outlook on, marriage (Jennings et al., 1991; Kinnaird & Gerrard, 1986; Willetts-Bloom & Nock, 1992). The current study extended this research by suggesting that nonparental models may also be involved in shaping attitudes toward marriage. In fact, the correlations between conflict and happiness in the positive model and marriage attitudes equaled or exceeded those for parental models, highlighting the need for further research on this topic.

The lack of significant relations between parental factors and divorce attitudes is contrary to prior research (e.g., Amato & Booth, 1991; Greenberg & Nay, 1982). Our findings are unlikely to be the result
of measurement limitations, as the measure of attitudes toward divorce was based on existing scales and had adequate reliability. We speculate that the lack of association between parental divorce and attitudes regarding divorce may stem from the young age of the current sample and from changes in societal norms regarding divorce. First, the young people who participated in our study may not have thought much about divorce, although many participants probably witnessed their friends and acquaintances becoming engaged and married during their college years. Second, adult participants in research conducted during the late 1970s and early 1980s were growing up when divorce rates first began to increase, and before divorce was “normalized.” In contrast, the college students in this study grew up after divorce had already become prevalent in U.S. society. As divorce becomes more socially acceptable, more nuanced ways of examining experiences related to parental divorce must be found, incorporating factors such as age at divorce, change in the parental relationship after divorce, and so on.

The final goal of the study was to examine the combined influence of the three relationship models on young adults’ attitudes regarding marriage and divorce. In keeping with the notion that parents are not the only models available to children as they grow up, we hypothesized that nonparental marital models would exert an effect on young adults’ views of marriage and divorce above and beyond that of parents. In hierarchical multiple regressions both parental and positive models predicted attitudes toward marriage, although in the overall regression only positive model happiness emerged as significant. Additionally, the inclusion of positive models significantly increased the predictive ability of the model. A second regression on attitudes toward divorce did not yield significant results, a surprising result because attitudes toward marriage and divorce were significantly correlated, so one might expect the same predictors to operate on both sets of attitudes (albeit in opposite directions). Because most studies examine either marriage or divorce attitudes, but not both, we cannot compare our findings to findings reported in prior research. It may be that different predictors exist for attitudes toward marriage and divorce; future research should investigate this possibility more fully. It should be noted that the addition of negative model variables increased the predictive ability of the overall model for divorce attitudes. These findings suggest the potential importance of nonparental models in shaping views of marriage and divorce, but replication is clearly needed before any conclusions can be drawn.

This study suggests the potential importance of examining the role of nonparental models in shaping young adults’ views of marriage and divorce, and the study’s limitations suggest directions for future

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Note. Marital status coded as not divorced = 0, divorced/separated = 1.
research. One limitation is that the study design was correlational and used self-report data, thus although theory led us to predict that characteristics of the models influenced attitudes, the reverse might be true (e.g., negative attitudes might color perceptions). A second limitation was the use of a college student sample; college students differ in socioeconomic background from the general population, and may also differ in other ways (e.g., they may hold more liberal views of divorce). A third limitation is that although the study extends prior research, which has focused almost exclusively on parents, there are other potential influences on views of marriage and divorce that were not considered here, such as the media (e.g., television, newspapers, magazines) or the doctrine of the young adult’s church. Future studies could address these limitations through longitudinal designs, data collection from multiple reporters, inclusion of ethnically and geographically diverse samples, and consideration of other sources of attitudinal influences. Another refinement for future research could involve obtaining a more nuanced understanding of how marital models might operate; for example, we did not examine the strength of attachment to each of the marital models, which might affect the level of influence the models had on young adults’ attitudes.

Despite its limitations, this study contributes to the existing literature on young adults’ attitudes toward marriage and divorce. Prior research has demonstrated the importance of the parental model in shaping young adults’ views, and our findings suggest the potential importance of nonparental models in this process. Future research is now needed to elucidate further how different types of marital models contribute to the formation of young adults’ attitudes toward marriage. The annual divorce rate among U.S. married women aged 15 and older is about 20 per 1,000 (CDC, 1995), and cumulative figures indicate that about half of all marriages in the U.S. will end in divorce. In order to develop effective counseling and education programs, information about the formation of attitudes regarding marriage and divorce is needed.

References
Effects of Racial Background and Sex on Identifying Facial Expressions and Person Perception

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GERMILINA ESPRITU
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RICHARD VELAYO*

Pace University

This study investigated the ability to accurately identify facial expressions of emotions of people of varying racial background: Asian, Black, Hispanic, and White. Through the use of a Person Perception Questionnaire and a Pictorial Test, 151 participants identified facial expressions of anger, disgust, fear, and sadness based as a function of the target individual’s racial background and sex. Results indicated that for the emotions of anger, disgust, and sadness, there were significant interactions based on the individual’s target race and sex. In addition, there were significant findings for the emotions of anger and fear identified in the White target individuals compared to the target individual typifying other races. We also found significant differences in the way women were perceived, compared to men, in social, intellectual, and favorability trait scores. These results may be applied in the areas of marketing and multicultural education to educate others concerning the differences in emotional expression across cultures.

Motional expression is a process that has often intrigued and aroused curiosity. At the same time, researchers have focused for many years on culture as a factor in the identification of emotions. Researchers in psychology and other behavioral sciences have pondered whether some emotional expressions are culturally specific or if they are universal among all people. What cultural factors dictate the manner in which emotions are expressed? Do age and sex influence emotional expression and its identification in others? Recent research has shown that emotions such as anger, fear, disgust, or sadness may, in fact, be influenced by one’s sex and racial background.

Research on gender roles has examined how society places expectations on the way men and women express themselves. For example, studies by Brody (1997) and Timmers, Fischer, and Manstead (1998) indicated that men tended to display emotions that demonstrated their authority whereas women were more inclined to show emotions that reflected their “femininity.” These studies also found that participants who did not conform to society’s stereotypes of gender-related emotional expression were often subject to risking their personal and even professional relationships.

Research has also shown how the origins of gender stereotypes of emotional expression can be traced to early childhood. Fritz (1997) explored how boys in Western society are influenced to act in ways in which they displayed emotions “typical” of a man from anger to disgust.

In cross-cultural studies of emotion, the focus has centered on the cultural determinants of emotional expression and its identification across different societies. Results of studies by Markus, Kitayama, and VandenBos (1996) and Rubin (1998) indicate that some emotions are predetermined by what a person’s culture dictates as appropriate. A comparison example used by both studies was the difference be-
between Western culture, which emphasizes the outward expression of emotions, and Asian societies, which may discourage such expression.

The two experiments that were the models for the present study involved how people in different cultures express emotions and how they identified emotional states in other cultures. Pittam, Gallois, Iwawaki, and Kroonenberg (1995) investigated the differences in the concepts of emotional expression by Australian and Japanese persons of themselves and each other. The results showed that with the use of pictures of fixed expressions, participants rated Australians as more expressive and Japanese as less demonstrative. Markham and Wang (1996) focused on the recognition of emotion by Chinese and Australian children. In the same way, the participants identified the emotional states of each other. Using pictures from Ekman and Friesen’s book, *Pictures of Facial Affect* (1976), the research concluded there was some evidence of an ethnic bias in emotion recognition. The ethnic bias consisted of participants being able to correctly identify emotional expressions of people from their own cultures but not those of people from other cultures. Another factor that influenced the results in both experiments was the knowledge or lack thereof that each group had of the other (Markham & Wang, 1996).

**Significance of the Study**

A study involving cross-racial identification of emotions has many implications for racially heterogeneous societies like the United States. One of those implications involves minimizing misinterpretations of how an individual perceives someone’s emotional state. This misinterpretation can occur, for example, when people ride public transportation where certain individuals might mistake facial expressions of persons from another race or culture as being hostile, when in fact, they may be sad. Connections can also be made in the education of culturally diverse children with emotional and behavioral disorders where instructors may misinterpret emotional outbursts that are culturally specific (Jackson & Bynum, 1997). This awareness can pave the way for modification of certain teaching techniques in order to accommodate the students’ needs. In clinical settings, therapists can also learn more about how certain patients of varied backgrounds may have emotional outbursts that correlate with their symptoms and allow for the possibility of misdiagnoses. The present study, although having to do with emotional expression recognition, can provide some valuable information for further research in this area. As for theoretical implications, researchers could find out how people of certain cultural backgrounds express themselves differently in the same or similar situations. These considerations are just some of the major theoretical and practical implications of this research project. This research intended to establish if facial expressions demonstrated by people, varying in racial background and sex, affected person perception among people of different racial backgrounds.

**Hypotheses**

To examine how facial expressions as a function of racial background and sex were identified by participants, we tested the following experimental hypotheses:

1. There would be significant differences in the identification of facial expressions among participants as a function of the target individual’s racial background.
2. There would be significant differences in the identification of facial expressions among participants as a function of the target individual’s sex.
3. There would be significant interaction effects between the racial background and sex of the target individual in the identification of facial expressions among participants.
4. The participants’ performance on the Pictorial Test would significantly influence their scores on the social and intellectual trait section of the Person Perception Questionnaire.

**Method**

**Participants**

The participants consisted of 151 individuals (ages 18–49) who identified the facial expressions. These individuals (69 women, 82 men) were classified by their racial backgrounds as Asian (18 women, 20 men), Black (18 women, 22 men), Hispanic (16 women, 21 men), or White (17 women, 19 men). The targets for the photographs likewise represented the same age demographic and the four racial criteria needed for the experiment. Individuals who served as targets were comprised mostly of the experimenters’ friends and coworkers.

**Experimental Design**

The experimental design involved randomly assigning participants to groups in which they viewed one of four photographs, and in which the target in the photos were either of the same or different race. The purpose behind this method was to test one of the hypotheses that assumed that participants were not likely to correctly identify specific emotions because of the target individual’s racial background. In this case, the independent variable was the race of the target individual (Asian, Black, Hispanic, and
White) in the photographs. Because we randomly assigned the photographs to participants of the same and opposite sex, this factor served as a classification variable; thus, we used a 4 (race target) × 2 (sex target) factorial design.

Materials

The 35-mm photos of the target individuals, taken from the base of the chin to the top of the forehead, excluded their attire and body type. The rationale for this procedure was to eliminate extraneous variables that may have influenced the participants’ responses. The subjects of the photographs elicited, under normal conditions, their facial expression for each of the specific test emotions: sadness, disgust, fear, and anger. The pictures used for the study were chosen through pilot tests conducted among the experimenters’ classmates. The pilot participants viewed the pictures and recommended which target individuals best exhibited the emotional expressions being elicited; we made the final selections according to their suggestions.

A Pictorial Test and a Person Perception Questionnaire were constructed for use in this experiment. The Pictorial Test used a Likert-type scale format that included four color photographs featuring the four corresponding emotions. The participant rated the degree to which each photograph displayed each of the four emotions on a scale of 1 to 5 (1 = least likely to 5 = very likely). The participants’ chosen rating for each picture was used for data analysis regardless of whether the participant chose the correct one.

The Person Perception Questionnaire consisted of 20 Likert-type items that were based on findings reported by Rosenberg, Nelson, and Vivekananthan (1968). That investigation found that people evaluated others in terms of their social and intellectual traits. These main trait categories were divided into two subcategories: 10 favorable and 10 unfavorable traits. The favorable and unfavorable traits each consisted of 5 social and intellectual traits (see Table 1). Participants were asked to rate the individual in each photograph on a scale of 1 to 5 (1 = mostly true at all; 5 = hardly true at all). In terms of scoring, assigned values were given for each trait. For favorable traits, the ranking mostly true received a score of –4, whereas partly true received a score of –2. On the other hand, for unfavorable traits, a ranking of mostly true received a score of –4, whereas partly true received a score of –2. The participants’ impression score consisted of the average of the rankings for all 20 items. The questionnaire’s authors reported no reliability coefficients, but studies have indicated that it was pretested and designed for the purpose of research (Rosenberg et al., 1968). A sample question appears below:

Helpful — tending to aid or assist a person in want, trouble, or distress.

Procedure

Prior to the experiment, we administered informed consent forms to the participants; then they filled out a demographic sheet consisting of information regarding their racial and educational backgrounds, age, and occupation. Afterwards, the participants rated the photographs in the Pictorial Test. The measure of the second dependent variable, the 20-item Person Perception Questionnaire, was then administered. After the completion of the experiment, we distributed explanatory debriefing forms.

Results

Using a two-way between-subjects analysis of variance (ANOVA) for a 4 × 2 factorial design, the first main effect hypothesis, which stated that participants would significantly differ in the identification of facial expressions because of the target person’s racial background, was confirmed at the 0.05 alpha level for the main effect hypothesis, which stated that participants would significantly differ in identifying facial expressions because of the target individual’s sex.
There were no main effects for disgust and sadness, but there were significant interaction effects between target racial background and sex in both facial expressions. Results confirmed the third (interaction effect) hypothesis for the racial background and sex factor in the identification of facial expressions for anger, \( F(3, 143) = 3.00, p < .05 \), disgust, \( F(3, 143) = 9.06, p < .001 \), and sadness, \( F(3, 143) = 2.72, p < .05 \). Using a Scheffé post hoc analysis test, results showed that race influenced the accuracy of judgments of anger, as that emotion was less readily identified in the Hispanic picture (\( M = 1.87, SD = .21 \)) than in the White (\( M = 2.91, SD = .21 \)), Black (\( M = 2.74, SD = .20 \)), and Asian pictures (\( M = 2.66, SD = .20 \)). In the facial expression for fear, as in the Asian picture (\( M = 3.32, SD = .22 \)) and Black picture (\( M = 2.87, SD = .22 \)), fear tended to be more identifiable in the White picture compared to the pictures of the other three races. In the facial expression for sadness, where the findings approached statistical significance, as in the Asian picture (\( M = 3.94, p = .23 \)), Black picture (\( M = 3.67, p = .22 \)), White picture (\( M = 2.95, p = .23 \)), and Hispanic picture (\( M = 3.47, p = .24 \)), sadness seemed to be more identifiable in the Black picture compared to the Asian and White pictures.

The two-way between-subjects ANOVA also revealed a significant interaction between racial background and sex on both anger and disgust. Through the use of multiple t-test comparisons, significant target sex and racial background differences were found regarding how the anger and disgust facial expressions were identified. As seen in Figure 1, anger expression was significantly easier to identify in the Asian male picture when compared to the Asian female, \( t(36) = 2.87, p < .005 \), and Hispanic female, \( t(34) = 4.23, p < .001 \), picture. Similarly, the Black male’s picture of anger expression was relatively easier to recognize than in the Hispanic male’s, \( t(41) = 2.15, p < .05 \), and the Hispanic female’s, \( t(36) = 3.1, p < .005 \), photograph. The White female’s expression of anger was also easier to identify than the Hispanic female’s, \( t(31) = 4.34, p < .001 \), and male’s, \( t(36) = 3.15, p < .005 \), pictures. Anger expression in the Black female picture was substantially more identifiable than in the Hispanic female picture, \( t(32) = 2.16, p < .05 \).

In the disgust facial expression, Figure 3 shows greater variance in scores than did the anger facial expression as a comparison in the interaction between the target racial background and target sex. We found that disgust expression on the Pictorial Test was significantly easier to identify in the Asian male picture than in the Asian female picture, \( t(36) = 2.62, p < .02 \), and Hispanic female picture, \( t(34) = 2.69, p < .02 \). In the same way, the Hispanic male’s picture of disgust was easier to identify than in both the Asian female picture, \( t(37) = 3.09, p = .004 \), and Hispanic female picture, \( t(35) = 3.14, p = .003 \). The Black male picture of disgust was more identifiable than in the

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**FIGURE 1**

Mean interaction scores of correctly identifying anger facial expressions between the four target individuals varying in racial background and sex.
Asian female picture, \( t(34) = 2.48, p < .02 \), and the Hispanic female picture, \( t(32) = 2.55, p < .02 \). The same was true with the White female picture, as disgust was more easily identified than in the Asian female picture, \( t(33) = 3.77, p = .001 \), and the Hispanic female picture, \( t(31) = 3.77, p = .001 \).

There were also significant main effects on how both sex and target race influenced social and intellectual trait judgments of the people as measured by the Person Perception Scale, where a higher rating in terms of the favorable social and intellectual traits produced a higher score. On the other hand, a higher rating in unfavorable social and intellectual traits resulted in a lower score. Using a between-subjects ANOVA, women were perceived as more favorable when compared to men, \( F(1, 143) = 5.97, p = .02 \) (see Figure 4). ANOVA also revealed a main effect of target sex, as the female photographs were seen as more socially positive than were the male pictures, regardless of race, \( F(1, 143) = 11.41, p = .001 \). However, no significant differences were found in the target racial background with the social, intellectual, and favorability trait scores, as well as in the intellectual trait scores according to the target sexes.

ANOVA also revealed interaction effects between target racial background and sex in the social trait scores, \( F(3, 143) = 4.81, p < .005 \), and the intellectual trait scores, \( F(3, 143) = 3.04, p < .05 \). The Black female picture was rated significantly higher on social traits than the White individuals’ photograph, regardless of sex. The results also showed that the Black male picture was rated significantly higher on intellectual traits than the Hispanic individuals’ pictures, regardless of sex.

**Discussion**

This study yielded many interesting and significant findings both in the identification of emotions and in person perception. Although sex of the target individual did not influence participants’ identification of the target individuals’ facial expression, race played an important role throughout the study.

We found that anger was relatively easier to identify in White and Black individuals than in Hispanic individuals. In addition, fear was also easier to identify in White individuals compared to the other three races. Individual differences, like the target individual’s facial structure (e.g., shape of nose, natural facial maturity, etc.), may explain this difference. For example, perhaps the target individual’s eyebrows were shaped in a way that made him or her look angry even when they are not asked to elicit an anger expression. Participants may have rated the person’s other emotional expressions lower because they predetermined that he or she was solely presenting a “naturally angry” demeanor. Another explanation could be the lack of information some participants had regarding people of other races. This “stranger
"effect" was evident in the Pittam et al. (1995) and Markham and Wang (1996) research where they concluded that the lack of knowledge the participants had of the target race pictured contributed to the way the participants identified the emotions presented. In this case, perhaps frequent interactions with the particular races would help people make accurate judgments of other people’s facial expressions.

In terms of the way people were perceived on the Person Perception Scale, there were a number of interesting findings. Participants generally rated Black women as more highly sociable than White individuals, and Black men were seen as having more intellectual traits than Hispanics. Perhaps these results reflect a generalized finding, or they may be unique to this study. Again, the critic has to take into account peripheral factors and the way they may have influenced some participants, from the frequency of their interactions with people representing the target individual’s race to incorrectly identifying expressions because of facial structure.

Unlike previous cross-cultural studies on emotion identification, which tested people of different racial backgrounds in their native lands, the participants of this study consisted of people of varying cultures living in the New York metropolitan area. In this case, the close proximity of the different cultures may have influenced the way participants identified facial expressions and perceived target individuals’ intellectual and social traits. Hence, living in such a culturally heterogeneous population enables people to better interact with and understand people from other countries. People in a culturally homogeneous population are less likely to accurately depict the emotional expressions of others from foreign countries because they have had less exposure to these people.

Men and women were perceived differently along social and intellectual favorability trait scales. Regardless of race, women scored higher in total traits (combination of social and intellectual) and were perceived as both more sociable and intellectual than their male counterparts. For the most part, women may be considered to be reliant on their intellectual qualities, whereas men are thought of as depending more on their physical strength. This finding can be argued when considering that women typically outnumber men in most college classes. Similarly, women are thought to be more sociable than men because of their ability to function better in group situations. Men, on the other hand, tend to be more aloof and operate better in circumstances where they have to work alone (Timmers et al., 1998).

Some suggestions for future studies would be controlling the degree to which the target individuals in the pictures posed particular target emotions. Perhaps vignettes of certain situations would aid tar-
gets in making the appropriate pose. At the same time, future researchers should take note of ethical issues concerning the potential distress such procedures may cause in the subjects of the pictures. For example, if disgust were the emotion being elicited, the vignette would have to contain something potentially disturbing that could evoke a “genuine” emotion in the target individual. Taking pictures of people in public settings could be an option, but doing so without people’s consent would not only be unfeasible but also unethical. Unfortunately, past research has not addressed the issue of acquiring photographs because most of the pictures were acquired from previously published sources. For future studies, researchers should look for better ways of acquiring photographs that accurately depict the emotions studied without having them look “artificial.”

Past research on cross-cultural emotions has focused on participants in one country identifying emotions of people from other parts of the world. There should be more emphasis on studying the emotions of people of different cultures who live in the same city or country. The basis for such studies is to help educate others in the way some cultures may use certain facial expressions to convey an emotion, which may be different from the norm and may be subject to misinterpretation. Future research should also investigate other factors that may influence a person’s ability to identify facial expressions (e.g., organismic or person variables, specific facial features, and cultural biases). This kind of research may be applied in the areas of marketing, community outreach, and multicultural education. This study may help educate people in the way some cultures may use certain facial expressions to convey an emotion differently than what they expect or the “norm.”

References

The Relation Between Obsessive–Compulsive Traits, Frontal Lobe Functioning, and Visual Recall

The authors of the current study administered the Wisconsin Card Sorting Test (Heaton, Chelune, Talley, Kay, & Curtiss, 1993), the Maudsley Obsessional–Compulsive Inventory (MOCI; Hodgson & Rachman, 1977), and the Rey-Osterrieth Complex Figure (Lezak, 1995) to 32 undergraduate students in order to test a model in which the effects of frontal lobe functioning on visual recall are mediated by obsessive–compulsive traits. Frontal lobe functioning predicted scores on 1 of the 4 MOCI subscales (i.e., slowness) and visual recall. However, obsessive–compulsive traits did not mediate the relation between frontal lobe dysfunction and visual recall as predicted. We present a revised model of the relation between frontal lobe functioning, visual recall, and obsessive–compulsive traits.

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OBSESSIVE–COMPULSIVE DISORDER (OCD) consists of intrusive, anxiety-provoking thoughts or images (obsessions) accompanied by repetitive behaviors or mental acts (compulsions) that the person feels driven to perform in response to the obsessions, although there is little or no realistic connection between the two (American Psychiatric Association, 1994). Previous research suggests that abnormalities in frontal lobe functioning contribute to symptoms of OCD (Kaplan & Sadock, 1998; Rapaport, Gill, & Schafer, 1968), and that OCD is a source of visual recall deficits (Kozak, Foa, & McCarthy, 1988; Savage et al., 1999). The purpose of the present study was to test a model in which obsessive–compulsive traits mediate the relation between frontal lobe functioning and visual recall. One of the earliest reports to link OCD to frontal lobe deficits was presented by Rapaport et al. (1968) who noted that individuals with OCD are somewhat disadvantaged in their ability to change cognitive set or strategy, which was identified as a frontal lobe function by Milner (1963). More recently, Kaplan and Sadock (1998) reported an increase of metabolism and blood flow in the frontal lobes of individuals diagnosed with OCD.

Because OCD is associated with visual integration deficits as well as frontal lobe dysfunction, some researchers have attempted to account for the co-occurrence of these three factors through models by attributing the visual integration deficits to the underlying frontal lobe dysfunction. Meyer and Deitsch (1996) reported that individuals with OCD have a meticulous approach to the block design and object assembly subtests of the Wechsler Adult Intelligence Scale–Revised (i.e., a scale that assesses visual construction abilities). This approach occasionally leads to a loss of speed points but seldom results in inaccurate performance. This finding suggests that the lower scores of individuals with OCD are related more to performance strategy (ostensibly a frontal lobe function) than to neurological deficits in visual processing per se (parietal or occipital lobe functioning). In addition, Kozak et al. (1988) associated slowness on visual construction tests with difficulty in shifting spatial strategies, implicating frontal lobe dysfunction as a source of compulsive slowness, which may in
Savage et al. (1999) found that participants with OCD had significantly lower levels of recall on visual memory tests than a non-OCD control group. In agreement with Rapaport et al. (1968), these authors attributed the visual recall deficits to frontal lobe dysfunction, particularly with difficulties in shifting spatial set. On the basis of these findings, Savage et al. proposed a model of visual memory deficits in persons with OCD in which frontal lobe functioning mediates the relation between OCD and visual memory performance (see Figure 1). This model, which posits OCD as a source of frontal lobe deficits, unduly reifies a purely descriptive concept. A diagnostic label such as OCD has no explanatory power apart from the known pathogenesis and the individual symptoms to which it refers. The current authors therefore revised this model by positing frontal lobe dysfunction as a source of four specific, measurable, obsessive–compulsive traits, which in turn account for visual recall deficits because of the disruptive effect these traits have on processing and organizing visual information (see Figure 2).

Previous research that attributed OCD to frontal lobe deficits relied completely on informal or indirect indicators of frontal lobe functioning, such as unstandardized measures of “organizational strategies” (Savage et al., 1999). In order to test the revised model depicted in Figure 2, we used a more widely accepted measure of frontal lobe functioning, the Wisconsin Card Sorting Test (Heaton, Chelune, Talley, Kay, & Curtiss, 1993). In addition, we assessed four obsessive–compulsive traits (slowness, checking, cleaning, and doubting) with the Maudsley Obsessional–Compulsive Inventory (Hodgson & Rachman, 1977). Following Savage et al. (1999), we assessed visual recall with the Rey-Osterrieth Complex Figure (Lezak, 1995).

The body of research previously cited led us to predict that frontal lobe function would be significantly related to one or more obsessive–compulsive traits. In accordance with the model adapted from Savage et al. (1999; see Figure 2), we predicted that obsessive–compulsive traits (i.e., checking, doubting, cleaning, and slowness) would mediate the relation between frontal lobe function and visual memory.

Method
Participants
Thirty-two students at the University of Nebraska at Kearney (16 men and 16 women) received extra credit in exchange for their participation in this study.
The age range of participants was from 18 to 45 years ($M = 20.6$).

**Measures**

**Maudsley Obsessional–Compulsive Inventory (MOCI).** The MOCI (Hodgson & Rachman, 1977) consists of 30 true-or-false questions from which four subscales are derived (i.e., checking, slowness, doubting, and cleaning). The reliability coefficients reported below are from Hodgson and Rachman (1977). The subscale of checking contains 7 items with a reported alpha of .70. A representative item is: “I do not check letters over and over again before mailing them” (reverse scored). The subscale of slowness consists of 7 items with a reported alpha of .70. A representative item is: “I do not usually count when doing a routine task” (reverse scored). The doubting subscale consists of 7 items with a reported alpha of .70. A representative item is: “I usually have serious doubts about the simple everyday things I do.” The subscale of cleaning consists of 11 items with a reported alpha of .80. A representative item is: “I don’t worry unduly about contamination if I touch an animal” (reverse scored).

**Rey-Osterrieth Complex Figure (ROCF).** The ROCF is a drawing that the participant reconstructs with paper and pencil while it is present and later from memory. It is comprised of 18 units that can be individually scored and summed to derive a measure of visual recall (Lezak, 1995). Two points are scored for each unit that is correctly placed and replicated. One point is scored for correct placement, even if it is poorly replicated. One point is also scored for correct replication, even if the unit is poorly placed. One half of a point is scored for units that are poorly placed and poorly replicated. Zero points are given for absent or unrecognizable units. This procedure yields a potential range of 0–36 points. Rapport, Charter, Dutra, Farchione, and Kingsley (1997) report an internal consistency coefficient (alpha) of .90 for the Lezak (1995) system of scoring the ROCF in a delayed-recall procedure (the procedure used in the current study and described below).

**Wisconsin Card Sorting Test (WCST).** The WCST (Heaton et al., 1993) is a measure of executive function that requires the individual to adjust his or her problem-solving strategy across changing stimulus conditions. The test consists of 4 stimulus cards and 128 response cards that depict figures of varying forms (i.e., crosses, circles, triangles, or stars), colors (i.e., red, blue, yellow, or green), and quantities (i.e., one, two, three, or four). The WCST challenges the participant to find and main-
tain the correct strategy for matching the response cards
to the stimulus cards (according to form, color, or num-
ber) based on feedback from the examiner as to whether
each attempted match is correct or incorrect. The cor-
correct sorting strategy changes intermittently without any
signal to the participant, and the participant then must
figure out the new, correct strategy. We operationalized
frontal lobe functioning as the number of sorting errors
on this test. This measure, which reflects the ability to
shift cognitive strategies, has been shown to be sensitive
to frontal lobe deficits (Heaton et al., 1993; Lombardi
et al., 1999). Reliability is reported in terms of generali-
zability coefficients (Heaton et al., 1993, pp. 40–41). The
coefficient for the measure used in this study (sorting
errors) was .71. For a complete discussion of generali-
zability theory and procedures, see Shavelson, Webb,
and Rowley (1989). For specific administration instruc-
tions see Heaton et al. (1993, pp. 5–7).

### Procedure

After we obtained informed consent from the
participants, the MOCI was administered. Once the
participants indicated they were finished, we admin-
istered the ROCF. Participants were instructed to
recreate the figure with pencil and paper while it
remained in front of them. When the participant com-
pleted the drawing it was replaced with a blank piece of
paper, and instructions were given to redraw the
figure from memory. A final drawing of the figure
was completed from memory after a 30-min delay,
which was the sample scored for the data analyses.
The WCST (Heaton et al., 1993) was administered
during this 30-min interval.

### Design

As previously stated, the purpose of this study was
to test a model in which obsessive–compulsive traits
mediate the relation between frontal lobe function
and visual recall. Baron and Kenny (1986) proposed
that in order to test for mediation, three regression
equations are required: the mediator is regressed on
the independent variable; the dependant variable is
regressed on both the indepen-
dent variable and the mediator. In order to establish
mediation the following four conditions must be met:

### TABLE 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Number of items</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slowness–revised</td>
<td>2.59</td>
<td>1.39</td>
<td>4</td>
<td>.72</td>
</tr>
<tr>
<td>Doubting</td>
<td>2.69</td>
<td>1.75</td>
<td>7</td>
<td>.65</td>
</tr>
<tr>
<td>Cleaning</td>
<td>4.47</td>
<td>2.70</td>
<td>11</td>
<td>.74</td>
</tr>
<tr>
<td>Delayed visual recall</td>
<td>21.64</td>
<td>6.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total WCST errors</td>
<td>33.94</td>
<td>24.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 2

| Correlation Matrix for Variables Used in Multiple Regressions |
|-------------------|-----|-----|-----|-----|-----|-----|
|                  | 1   | 2   | 3   | 4   | 5   | 6   |
| 1. Sex            | −.39*|    | −.61**|    | −.22|    |
| 2. Cleaning       |    | .38*|    | −.22|    | −.15|
| 3. Doubting       | −.02|    | .62**|    | .00 | .24 |
| 4. Slowness       |    |    | −.27| −.45**| .16**|    |
| 5. Delayed recall |    |    |    | −.11|    | .42*|
| 6. Total errors   |    |    |    |    | −.45**|    |

*p < .05, **p < .01.
the independent variable must be significantly related to the mediator variable; the independent variable must be significantly related to the dependent variable; the mediator must be significantly related to the dependent variable; and the beta weight of the independent variable in the third equation must be less than that of the second equation.

We tested a separate mediated model for each obsessive–compulsive trait (posited as mediating variables): doubting, checking, cleaning, and slowness. The same “independent” and “dependent” variables were used for each of these models. The “independent” variable was the total number of errors on the WCST (frontal lobe functioning) and the “dependent” variable was the delayed recall score from the ROCF (visual recall; Lezak, 1995).

**Results**

Reliability (alpha) coefficients were calculated for each of the four subscales of the MOCI (doubting, checking, slowness, and cleaning). The coefficients in our sample (checking $\alpha = .41$, cleaning $\alpha = .74$, slowness $\alpha = .32$, and doubting $\alpha = .65$) were not found to be as high as those reported by Hodgson and Rachman (1977). In an attempt to increase the overall reliability of the slowness and checking subscales, we removed items that did not correlate significantly with the overall scale. This procedure increased the alpha coefficients to .72 for slowness and .57 for checking. Because the coefficient for checking remained unacceptably low, it was discarded from further analysis. For the psychometric properties of the scales used in this study, see Table 1.

A correlation matrix was created from the following variables: sex, cleaning, doubting, slowness, gender, delayed recall, and the WCST total errors (see Table 2). Because sex (coded men = 0; women = 1) correlated significantly with all three MOCI subscales, it was included as a control variable in the multiple regressions used to test the model.

In the doubting-mediated model, the first regression of doubting on total WCST errors was not significant ($p > .20$, $\beta = .23$). This nonsignificant finding ruled out a mediated model for the symptom of doubting according to the criteria of Baron and Kenny (1986). In the cleaning-mediated model, the first regression of cleaning on the total WCST errors was not significant ($p > .22$, $\beta = .21$). This nonsignificant finding also ruled out a mediated model for the symptom of cleaning.

In the slowness-mediated model, the first regression of slowness on WCST errors was significant ($p < .01$, $\beta = .36$; see Table 3). The second regression for testing the model, delayed visual recall on total WCST errors, was also significant ($p < .01$, $\beta = -.51$; see Table 4). In the third regression of delayed visual recall on total WCST errors and slowness, WCST errors was significant ($p < .01$, $\beta = -.44$), but slowness was not ($p > .48$, $\beta = -.16$; see Table 5). This nonsignificant finding for slowness in the third regression ruled out the proposed mediated model for the obsessive–compulsive trait of slowness.

These findings suggest that a relation exists between frontal lobe functioning and visual recall, and between frontal lobe functioning and slowness, but that slowness does not mediate the relation between frontal lobe function and visual recall. These findings led to the post hoc formation of a new model that

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>$B$</th>
<th>$SE\ B$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCST total errors</td>
<td>-.49</td>
<td>-.13</td>
<td>.04</td>
<td>$p &lt; .01$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>$B$</th>
<th>$SE\ B$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>-.29</td>
<td>-3.81</td>
<td>2.10</td>
<td>$p &gt; .07$</td>
</tr>
</tbody>
</table>

**TABLE 3**

Multiple Regression for OCD Slowness ($R^2 = .49$)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>$B$</th>
<th>$SE\ B$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>-.56</td>
<td>-1.65</td>
<td>.40</td>
<td>$p &lt; .01$</td>
</tr>
<tr>
<td>WCST total errors</td>
<td>.34</td>
<td>.02</td>
<td>.01</td>
<td>$p &lt; .02$</td>
</tr>
</tbody>
</table>
posits frontal lobe dysfunction, measured by the total number of errors on the WCST as a direct influence on both the obsessive–compulsive trait of slowness as measured by the MOCI and the visual recall deficits as measured by the Rey-Osterrieth Complex Figure (see Figure 3).

**Discussion**

We revised the mediated model proposed by Savage et al. (1999) due to the implausibility of positing the diagnosis of OCD as a causal variable for the prediction of frontal lobe dysfunction and visual recall deficits (see Figure 1). It was hypothesized that our results would be consistent with this revised model (Figure 2) in that the relation between frontal lobe dysfunction on visual recall deficits would be statistically mediated by obsessive–compulsive traits. Our results indicated that frontal lobe functioning predicts visual recall, as well as obsessive–compulsive slowness, but that slowness does not mediate the relation between frontal lobe measures and visual recall as predicted. This pattern of results suggests a non-mediated, direct-effect model in which frontal lobe function affects both obsessive–compulsive slowness and visual recall. Visual recall is not associated with slowness when the relation between visual recall and frontal lobe functioning is statistically controlled (see Table 5); therefore, slowness is not a mediator (see the criteria for mediation described above). It should be noted that the WCST taps only one frontal lobe

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>−.38</td>
<td>−4.98</td>
<td>2.65</td>
<td>$p &gt; .07$</td>
</tr>
<tr>
<td>WCST total errors</td>
<td>−.44</td>
<td>−.12</td>
<td>.05</td>
<td>$p &lt; .02$</td>
</tr>
<tr>
<td>OCD slowness</td>
<td>−.16</td>
<td>−.71</td>
<td>.98</td>
<td>$p &gt; .47$</td>
</tr>
</tbody>
</table>

**FIGURE 3**

Final model of visual recall deficits associated with OCD traits.
function (knowing when to maintain or shift strategies), and that other frontal lobe operations might also influence obsessive–compulsive traits or symptoms.

A deficit in the ability to shift cognitive strategies as measured by the WCST is a form of perseveration, which is defined as the “persisting response to a previous stimulus after a new stimulus has been presented” (Kaplan & Sadock, 1998, p. 282). Perseveration, a symptom of frontal lobe dysfunction (Freedman, Black, Eber, & Binns, 1998; Lombardi et al., 1999; Milner, 1963; Na et al., 1999), may partially account for obsessive–compulsive slowness through its interference with problem solving and the completion of tasks. At the same time, perseverative tendencies might also account for the relative deficits in visual recall performance among people with obsessive–compulsive tendencies. Multiple strategies are needed for complete reconstruction on visual recall tasks (e.g., looking at the whole, looking at the parts, looking at two parts in relation to one another, etc.); therefore, perseveration of any single reconstructive strategy would plausibly impair visual recall performance.

It should be noted that the use of a college population is a weakness in the current study. Our results are only suggestive, and the resulting model should not be applied to clinical populations without further research. There are several reasons for this caution. Primarily, there could very well be qualitative (not only quantitative) differences between our participants and actual individuals with OCD. Further, OCD was treated in the current study as a continuous variable, whereas standard clinical practice recognizes OCD as a dichotomous variable (i.e., as a diagnosis). The use of DSM-IV criteria for OCD also would have improved the external validity of this study. Therefore, the relevance of our study for actual individuals with OCD is questionable pending replication with clinically diagnosed participants.

Savage et al. (1999) initiated the experimental investigation of the relation between OCD, frontal lobe dysfunction, and visual recall deficits. Our results indicate that the relation between frontal lobe dysfunction and visual recall deficits is not mediated by obsessive–compulsive traits as predicted. Instead, the effect of frontal lobe dysfunction on visual recall appears to be a direct one, as is its effect on obsessive–compulsive slowness. These current findings show that future research should consider specific OCD symptoms in an actual clinical population.

References


Sincere appreciation is expressed for the hard work on the part of the following individuals who served as reviewers for this issue. Without the assistance of such dedicated professionals, the *Psi Chi Journal* simply would not be able to function!

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Psi Chi annually sponsors national undergraduate and graduate research award competitions, as well as research awards for members submitting the best research for the regional and national paper/poster sessions. Members are encouraged to begin research papers early to submit for presentation at local, state, regional, or national conventions. Chapters are encouraged to provide an opportunity for members to rehearse their papers before an audience prior to presenting them at a convention.

In addition, Psi Chi also sponsors grant programs to fund student and faculty research. Psi Chi’s total award and grant programs now provide over $180,000 to members. Descriptions of the award/grant competitions follow. Further information and submission forms may be obtained from Psi Chi’s national website (www.psichi.org) or from the Psi Chi National Office, P.O. Box 709, Chattanooga, TN 37401-0709; telephone: (423) 756-2044; e-mail: psichi@psichi.org.

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All Psi Chi undergraduate members are eligible to submit their research for the Psi Chi/J. P. Guilford Undergraduate Research Awards. Cash awards are $1,000 for first place, $650 for second place, and $350 for third place. In addition, all winners and their faculty research advisors receive award certificates. The abstracts of the winning papers, as well as photographs and brief biographies of the top three winners, are published in Eye on Psi Chi. The deadline for this award is May 1 (postmark).

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The Psi Chi/Allyn & Bacon Psychology Awards, sponsored by Allyn & Bacon Publishers, are open to all undergraduate Psi Chi members and are awarded to those who submit the best overall empirical research papers. The awards are $500 for first place, $300 for second place, and $200 for third place. In addition, all winners and their faculty research advisors receive award certificates. The abstracts of the winning papers, as well as photographs and brief biographies of the top three winners, are published in Eye on Psi Chi. The deadline for this award is May 1 (postmark).

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All psychology graduate students are eligible to submit their research for the Psi Chi/APA Edwin B. Newman Graduate Research Award. The winner receives the following: (1) travel expenses to attend the APA/Psi Chi National Convention to receive the award, (2) a three-year subscription to an APA journal of the winner’s choice, and (3) two engraved plaques, one for the winner and one for the winner’s psychology department as a permanent honor to the winner. In addition, the abstract of the winning paper, as well as a photograph and brief biography of the winner, is published in Eye on Psi Chi. This award is the only student research award presented during the prestigious APA/APF Awards ceremony at the APA/Psi Chi National Convention in August. The deadline for this award is February 1 (postmark).

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All Psi Chi members (undergraduate and graduate) are eligible to submit their research for the Regional Research Awards. Cash awards of $300 each are presented to students submitting the best research papers to Psi Chi sessions at regional conventions. The number of awards in each region will vary with the size of the regions; a total of 78 awards of $300 each are available for the 2001–2002 year. Award monies are distributed at the conventions following the presentations. The Psi Chi regional vice-presidents each send a Call for Papers and a letter to the Psi Chi chapters in their respective regions during the fall.
These letters include information about the Regional Research Awards, the regional conventions, and submission deadlines for Psi Chi programs. Deadlines for submissions vary according to region and sometimes from year to year; check your fall regional mailing or the Psi Chi national website (www.psichi.org) for details.

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All undergraduate Psi Chi members are eligible to apply for these undergraduate research grants. The purpose of this program is to provide funds for members to defray the cost of conducting a research project. Applicants may request up to $1,500 for each project. A total of $45,000 has been allotted for this student grant program. The deadline for this grant program is October 1 (postmark).

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All undergraduate Psi Chi members are eligible to apply for these summer research grants (research must be conducted while still an undergraduate, not after graduation). The purpose of this program is to provide funds for members to conduct summer research at Level I or Level II research institutions. During the 2001–02 year, Psi Chi will award six grants of $3,500 (a stipend of $2,500 to the Psi Chi student plus $1,000 to the sponsoring faculty member at the research institution). The deadline for this grant program is March 30 (postmark).

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All undergraduate Psi Chi members are eligible to apply for these summer research grants, which are offered by Psi Chi in conjunction with the Research Experiences for Undergraduates (REU) program sponsored by the National Science Foundation (NSF). The purpose of this program is to provide funds for members to conduct summer research at Level I or Level II research institutions that have been identified by NSF as REU sites. This research must be conducted while still an undergraduate, not after graduation. Psi Chi will award a total of six grants to fund Psi Chi members who qualify for an NSF–REU grant during the 2001–02 year. A total of $30,000 has been allotted for this grant program. The deadline for this grant program is spring 2002 (check Psi Chi website for further details—www.psichi.org).

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All current faculty advisors and coadvisors who have served an active Psi Chi chapter for at least one year are eligible to apply for these faculty advisor research grants. The purpose of this program is to provide funds for advisors to defray the direct costs of conducting a research project (no stipends included). Two grants will be awarded annually within each of Psi Chi’s six regions, for a total of 12 grants. The maximum amount of each grant will be $2,000. The deadline for this grant program is June 1 (postmark).

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All Psi Chi student and faculty members are eligible to apply for a Thelma Hunt Research Award. Up to three awards of $3,000 each are presented annually to enable members to complete empirical research that addresses a question directly related to Psi Chi, as posed by either (1) the Psi Chi National Council, or (2) the researcher submitting a proposal. Unlike other national Psi Chi award/grant programs, the Hunt Awards focus on research directly related to the mission of Psi Chi. The deadline for this award program is October 1 (postmark).

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The purpose of this program is to provide funds for local/regional undergraduate psychology research conferences. Funding is intended for conferences that will invite student research presenters from at least three schools in the area and will notify all Psi Chi chapters in the geographic area of the conference. Funding is not available for conferences intended for students from a single school. If a single school organizes the conference (and invites other schools), the school submitting an application must have a Psi Chi chapter. If a consortium of schools organizes the conference, at least one member of the consortium must have a Psi Chi chapter in order to be eligible to apply. The maximum grant for each conference is $1,000. The deadline for this grant program is December 1 (postmark).
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