Understanding family dynamics in a cross-cultural sample

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Understanding family dynamics in a cross-cultural sample

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in Applied Psychology (Clinical Psychology concentration)
in the Department of Psychology

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The Circumplex Model of family functioning posits that balanced levels of cohesion and adaptability are associated with positive familial outcomes, whereas extremely high or low levels of these factors are associated with deleterious outcomes. Despite the popularity and utility of this model in Western cultures, there is a dearth of empirical data supporting its use in less Western or more culturally diverse cultures. The current study assessed the Circumplex Model of family functioning, cultural factors, and emerging adult outcomes (e.g., substance use, risky sexual behavior, emotional problems, prosocial behavior) across 18 U.S. sites, China, Nigeria, Switzerland, Iran, Turkey, and the United Kingdom. Participants were \( N = 3593 \) emerging adults, the majority of which were women (71.3%) and White (59.1%). Collaborators were participants in Psi Chi’s Network for International Collaborative Exchange (NICE) and administered measures of family dynamics, cultural orientation, substance use, risky sexual behavior, and mental health outcomes to participants in a random order. The Circumplex Model of Family Functioning did not fit cross-culturally. A global six-factor model was created through factor analytic techniques that was invariant across samples and between genders. Culture significantly moderated the relation between family model variables and emerging adult outcomes. The current study suggests the cultural context in which family dynamics occur should be taken into
consideration when evaluating behavioral outcomes. The best strategies for promoting positive outcomes in emerging adults may depend on the family’s cultural orientation and may require adaptation in intervention.
ACKNOWLEDGEMENTS

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CHAPTER I
INTRODUCTION

**Understanding Cross-Cultural Family Dynamics**

Family structures and dynamics are important areas of research in assessing psychopathological and behavioral etiology and targets of intervention (Härkönen, et al., 2017). Despite years of research, validating models of family structures cross-culturally has had little success (Pirutinksy & Kor, 2013). Although cross-cultural research on attachment has been conducted, the Family Circumplex Model, a model that has been widely studied in the literature, has had mixed results in cross-cultural samples (Forjaz et al., 2002; Gomes et al., 2017; Pirutinksy & Kor, 2013). For example, many studies conducted in Westernized samples have found similar family dynamics, such as high enmeshment or rigidity, across negative outcomes (e.g., psychopathology, substance use); other studies from more Eastern or collectivist societies have found family dynamics of enmeshment and rigidity associated with less negative outcomes (Sorkhabi, 2005). Furthermore, research on parenting styles suggests different outcomes based on regions within the U.S. as well as between countries (Lansford, 2010; McKinney & Brown, 2017; Sorkhabi, 2005). Aspects of the parent-child relationship including conflict, cohesion, discipline, communication, and warmth vary by ecological context (McHale et al., 2014; Szapocznik & Kurtines, 1993).

Considering models such as Brofenbrenner’s Ecological Systems theory (e.g., Brofenbrenner, 1977), the family system exists in a much larger ecological context that
influences important parent-child dynamics. Additionally, according to contextualism, people’s individual experiences are likely influenced by their environment and language; for example, children in different environments are likely to perceive family dynamics and parental behaviors differently and experience different psychological outcomes (Lerner & Kauffman, 1985; McKinney & Brown, 2017). Thus, it is unlikely for one family model to be ecologically valid across the many varying contexts in the world; however, it is important to understand when such exceptions to models arise and to specify appropriate models for those exceptions.

Much of family research has focused on White and Westernized populations and has resulted in potential biases in family interventions and policies regarding families which include adoption and foster placement, legal intervention in maltreatment cases, and encouragement of autonomy and freedom in family therapy practices (Ards et al., 1998; Pelton, 2015). With an increasingly accessible world and contact across cultures, it is particularly relevant to reconsider concepts of family dynamics with a global mindset. Thus, the current study assessed the Family Circumplex Model across multiple cultures to determine differences in constructs and related outcomes of internalizing (e.g., depression, anxiety) and externalizing behaviors (e.g., substance use, risky sexual behavior, conduct problems).
Circumplex Model

The Circumplex Model of Family Functioning is a foundational model in family research (Olson et al., 1979). The major components of the Circumplex Model include cohesion, adaptability, and communication. Cohesion is defined as the bonding and boundaries in family relationships, with bonding typically measured on dimensions of perceived care and support and boundaries assessed on dimensions of autonomy and safety. Cohesion ranges from disengaged, or low bonding and high boundaries, to enmeshed, or high bonding and low boundaries. Adaptability is characterized by changes in family roles and degrees of cohesion and communication given changes in external stressors (e.g., financial stressors, moving, loss, etc.) and ranges from chaotic to rigid. Communication facilitates adaptability and cohesion and is typically categorized as positive (e.g., reflective listening, supportive comments, etc.) or negative (e.g., criticism, double standards, etc.).

Specific behaviors relate to the different facets of the Circumplex Model. Specifically, cohesion includes the level of closeness between family members, loyalty, and level of dependence on one another. Adaptability includes whether leadership is shared in the family (e.g., authoritarian leadership in rigid families), types of discipline used (e.g., inconsistent discipline in chaotic families), role change (e.g., roles change as children age in flexible families), and change to dynamics under external stress (e.g., structured families change when...
demanded). The research regarding the Circumplex Model generally supports that children have the most positive outcomes when families have high cohesion, characterized by strong bonds with some autonomy, and high adaptability, characterized by ability to share roles and leadership and change dynamics somewhat under duress (Kouneski, 2002).

**Family Functioning and Psychological Problems**

Theories of family systems and social learning suggest that family dynamics predict outcomes due to the interactions between parents and children (Akers, 1985; Crossno, 2011). The level of cohesion and adaptability is associated with how often parents respond to their children’s needs and how often children seek their parents when distressed, and the relationship between parents and children predicts the coping skills associated with outcomes of depression, anxiety, and other adjustment difficulties (Devi et al., 2017). Additionally, the direct interactions between parents and children also model coping skills related to health risk outcomes of risky sexual behavior and substance use (Patterson et al., 2017).

Negative outcomes associated with less optimal family dynamics (e.g., high enmeshment or disengagement and chaotic or rigid adaptability) are varied. Research suggests that high family enmeshment is associated with outcomes such as poorer career outcomes, higher internalizing problems, and higher substance use (Simpson et al., 2018; Sturge-Apple et al., 2010). Additionally, high family disengagement is associated with higher risky sexual behavior, higher violent outcomes, and higher alcohol use. Furthermore, high family rigidity, associated with strict discipline that involves physical punishment or psychological and behavioral control, is associated with a plethora of negative outcomes including higher internalizing psychopathology, higher aggression, and lower self-esteem (Smokowski et al., 2014). Higher chaotic family systems, associated with erratic discipline and inconsistent parenting, are
associated with poorer school adjustment, higher interpersonal conflict, and externalizing psychopathology (Simons & Conger, 2007; Stoneman et al., 1989)

Although an abundance of research suggests less optimal family dynamics are associated with negative outcomes, few studies have been conducted outside of majority White Westernized samples. The Circumplex Model’s foundation is based in Westernized values of individualism and autonomy, which may not promote the best outcomes in all cultures or contexts (Kouneski, 2002; Pirutinsky & Kor, 2013). Specifically, Pirutinsky and Kor assessed the Circumplex Model in a sample of Israeli Orthodox Jewish families and found that the model poorly fit their sample and that high rigidity and family enmeshment were not correlated with negative outcomes. The authors suggested that the religion and culture of Israeli Orthodox Jewish families promotes dependency between family members and rigid role expectations between parents and children, such that higher functioning families would be less likely to fit within the typical adjusted family Circumplex Model. Pirutinsky and Kor proposed that assumptions made by the Circumplex Model may require adjustment in cross-cultural samples to better generalize to family functioning in non-Westernized samples. For example, Forjaz and colleagues (2002) conducted a confirmatory factor analysis in a Spanish speaking sample using a previous assessment tool of the Circumplex Model and recommended inter-correlating error terms on the adaptability and cohesion variables to improve fit. Similarly, research on discipline and parenting styles in different regions of the United States (e.g., Southern, Northeastern, Midwestern) suggests that the negative effects of authoritarian parenting and harsh discipline in samples from the Southern United States may be reduced as a function of cultural norms and expectations, such that children may perceive harsh parenting as fair in the context of a supportive relationship (McKinney & Brown, 2017; Sorkhabi, 2005).
Cross-Cultural Family Dynamics

As the family unit is an important system for every individual, it is important to consider the continuum of collectivist and individualistic values that affect the way individuals perceive themselves within their family system. Collectivism values group-oriented prioritizing over the individual and highlights societal values, whereas individualism prioritizes the individual, autonomy, and agency over the values of the society and the system (Schwartz et al., 2012). For example, individuals in a collectivist society may value achieving goals based on familial expectations, such as taking on a specific profession or choosing a partner with specific characteristics, over an independent lifestyle (Schwartz et al., 2012). Thus, family cohesion will likely be different in a collectivist society where individualism and autonomy are less valued. Furthermore, filial piety, or the value of respecting elders in a society, supports that more rigid family dynamics are associated with better outcomes in more collectivist societies (Chen, 2014). Similarly, values of conservatism and authoritarianism in regions such as mainland China, Northern Africa, rural areas of the Middle East, and the Southern United States promote respect of authority figures in a society including family elders (Chen, 2014; Dwairy et al., 2006; McKinney & Brown, 2017). Factors of filial piety and conservatism are typically associated with religiosity and the authoritarianism sometimes associated with religiosity frequently transfers into family dynamics (Mahoney et al., 2003). These societal factors and values play an important role in understanding the family sub-system and how those dynamics play a role in the outcomes of children in these families.

Whereas research supports attachment as cross-culturally generalizable, parent-child relationships change by the time children reach emerging adulthood (Mesman et al., 2016). For example, what is considered a display of warmth may differ by cultural context such that in some
cultures parents may express warmth with less verbal frequency but display satisfactory support through financial, instrumental, or physical affection (Rohner et al., 2008). Additionally, some emerging adult children may be satisfied with lower or higher frequency of supportive behaviors. Thus, the level of cohesion children report may be impacted by how much and what type of support they receive from their parents (Furman & Buhrmester, 1992; Steinberg & Darling, 2017). Thus, the construct of cohesion may change based on cultural values and how those values impact adult children’s perceptions of their parents’ behaviors.

**Gender**

Recently, family research has focused on both mother and father behaviors. This shift in focus from only mother-child relationships has provided insight into how paternal behaviors may play a specific role in family systems which are associated with child outcomes of substance use, risky sexual behavior, and adjustment (Ali et al., 2015; Ellis et al., 2012). Furthermore, parent-child gender dyads play a role in the development of psychopathology (McKinney et al., 2018). Specifically, fathers may be more likely to discipline their sons more harshly than their daughters and parents may be more permissive to daughters than to sons (McKinney & Renk, 2008). Similarly, a study conducted in China indicated that both mothers and fathers were more likely to physically discipline their sons rather than their daughters (Cui et al., 2016). In a sample of Arab societies, females were more likely to report authoritative parenting practices, whereas males were more likely to report authoritarian parenting practices (Dwairy et al., 2006). Parental behaviors, such as low warmth, predicted higher externalizing problems in sons and higher internalizing problems in daughters (Bosco et al., 2003). Given the importance of social constructs in assessing family dynamics, assessing both maternal and paternal supportive and
discipline behaviors cross-culturally will facilitate clarification of both parents’ roles in family systems.

**Current Study**

The current study assessed the Circumplex Model of family functioning and emerging adult outcomes of current substance use, risky sexual behavior, internalizing problems, prosocial behavior, hyperactivity, and conduct problems cross-culturally. Cultural factors of filial piety, socioeconomic status, and cultural orientation (i.e., collectivism, individualism) also were assessed to compare amongst groups given that they are frequently identified as important moderators of the effects of family systems. As shown in previous studies, families and parents continue to play an important role in the behavior and adjustment of their emerging adult children (Asberg et al., 2008). The current study used structural equation modeling (SEM) and multigroup analysis (MGA) to compare family dynamics across regions within the United States (e.g., Northeast, South, Midwest) and across countries (e.g., Northeastern China, Nigeria, Switzerland, the United Kingdom).

Hypothesis 1 stated that structural equation modeling of each sample would have better model fit for the Circumplex Model in samples from more Westernized (i.e., both regionally and culturally) samples (e.g., Northeastern and Midwestern regions of the U.S., Mexico, Switzerland, the United Kingdom) and poorer model fit from less Westernized samples (e.g., China, Nigeria), although the hypothesis is somewhat exploratory in nature and may require exploratory factor analysis if theoretical model fit is poor as few international samples have utilized the Circumplex Model (e.g., Pirutinksy and Kor, 2013). Hypothesis 2 stated that some models would be invariant, such that more Westernized samples would be invariant with one another and less Westernized samples would be invariant with one another, and that invariance would be
demonstrated across gender (i.e., males and females). Inter-correlations among constructs also will be assessed, although it is unclear how samples may differ in correlations among the six Circumplex Model variables. For example, Pirutinsky and Kor (2013) found that rigidity especially did not correlate with other constructs as in the Circumplex Model validation sample, and the reason for why was speculative (i.e., potentially related to religious factors in their sample).

Hypothesis 3 stated that less adaptive family model variables (i.e., indicated by higher disengagement, enmeshment, chaotic, and rigid family dynamics) would be associated with higher risky sexual behavior, substance use, internalizing problems, hyperactivity, peer problems, and conduct problems, as well as lower prosocial behavior. It also was expected that these relations may be different between more and less Westernized samples. The current study speculated that an explanation for these expected differences across samples may be related to cultural orientation and filial piety. Thus, hypothesis 3a stated that the relation between family model variables and emerging adult outcomes would be moderated by collectivism/individualism and filial piety, such that higher collectivism and filial piety would partially explain how less adaptive family models in certain samples may predict less negative outcomes (e.g., relatively lower substance use, risky sexual behavior, internalizing problems). Given the consistent findings across cultures about the prevalence of the types of psychological problems males and females report, hypothesis 3b stated that less adaptive family dynamics would be associated more strongly with externalizing problems for males and internalizing problems for females.
CHAPTER III
METHODOLOGY

Participants
Participants consisted of approximately at least 100 emerging adults from 18 sites across the U.S. (see Table A1) and sites in China, Nigeria, Switzerland, Iran, Turkey, and the United Kingdom (\(N = 3,593\)). Participants ranged in age from 18 to 29 (\(M = 19.91, SD = 2.48\)) with majority reported female (71.32%). Participants reported racial backgrounds of White (59.1%), Black (12.33%), Hispanic (10.11%), Asian (11.92%), Native American (0.80%), Native Hawaiian (0.91%), and Other (4.20%), with race coded by group with numbers for use as a covariate. Participants reported that 35.70% of fathers and 29.44% of mothers completed a high school diploma, 12.32% of fathers and 15.32% of mothers completed an associate’s degree, 24.62% of fathers and 27.90% of mothers completed a bachelor’s degree, and 15.82% of fathers and 17.00% of mothers completed a graduate degree. See Tables A2 through A4 for further details regarding demographic characteristics.

Procedure
Collaborators were invited to collect online survey data of their institution’s college students through Psi Chi’s Network for International Exchange: Crowd sourced project. Collaborators voluntarily signed up if they were interested in the project in exchange for sharing the crowd-sourced data upon completion as well as authorship on the main manuscript publication, pending collection of approximately 100 participants. Each site completed their own
Institutional Review Board protocol housed under their own institution, with the indication that aggregate anonymous data would be shared upon completion of data collection. All data collections were conducted anonymously online with some completed through undergraduate psychology participant pools, some through voluntary participation, and others through paid participation. Qualtrics was utilized for almost all data collections, with several sites using Google Forms. All measures were presented in randomized order to participants and participants were asked to respond based on current perceptions including their current family structure. Measures were piloted in countries where English was not the first language to determine if translation was necessary. After piloting, it was only necessary to translate measures into Turkish. All of the measures were translated and back-translated using standard practice (e.g., Chapman & Carter, 1979) into Turkish.

**Measures**

**Family Circumplex Model**

The Family Adaptability and Cohesion Scale (FACES-IV; Olson, 2011) is a 42-item measure that assesses adaptability and cohesion dimensions of family dynamics on a 5-point Likert scale from 1 = *Strongly disagree* to 5 = *Strongly agree*. Six subscales include balanced cohesion (e.g., *Family members are involved in each others’ lives*), balanced flexibility (e.g., *Discipline is fair in our family*), disengaged (e.g., *Our family seldom depend on each other*), enmeshed (e.g., *We spend too much time together*), rigid (e.g., *Our family is highly organized*), and chaotic (e.g., *Things do not get done in our family*). FACES has been validated in North American and European based samples with Cronbach’s alpha scores ranging from .75 to .89. Alphas for the current study ranged from .77 to .87.
**Filial Piety**

The Contemporary Filial Piety Scale (CFPS; Lum et al., 2016) is a 10-item scale that assesses reverence and honor of duty to family on a 5-point Likert scale from 1 = very unimportant to 5 = very important. The two subscales include pragmatic obligations (e.g., *Arrange appropriate treatment for parents when they fall ill*) and compassionate reverence (e.g., *Try my best to achieve parents’ expectation*). It has been validated in samples from the metropolitan area of Hong Kong, China, and Puerto Rico with Cronbach’s alpha ranging from .84 to .90 (Boucher, 2017). The current study created a total scale using a sum score from all 10 items (e.g., Lum et al., 2016) which resulted in an alpha of .93.

**Cultural Orientation**

The Culture Orientation Scale (COS; Triandis & Gelfland, 1998) is a 16-item measure that assesses four dimensions of cultural orientation on a 9-point Likert scale ranging from 1 = never or definitely no to 9 = always or definitely yes. Four subscales include vertical collectivism (e.g., *Family members should stick together, no matter what sacrifices are required*), vertical individualism (e.g., *Winning is everything*), horizontal collectivism (e.g., *If a coworker gets a prize, I would feel proud*), and horizontal individualism (e.g., *I rely on myself most of the time; I rarely rely on others*). Multiple studies have indicated good convergent and discriminant validity with similar measures with alphas ranging from .62 to .80, although authors note that the scale often has restriction of range when data is collected from one sample and may lower alpha scores (Triandis & Gelfland, 1998). The current study created one total orientation scale by reverse coding the vertical and horizontal individualism scales and summing them with the collectivism scales, such that higher scores indicated higher levels of collectivism and lower scores indicated higher levels of individualism for use in the prediction model which resulted in an alpha of .83.
(Triandis & Gelfland, 1998). Furthermore, to differentiate cases by cultural orientation for use in confirmatory factor analysis model testing, cutoffs were utilized for scores > 72 as collectivistic and < 72 as individualistic (e.g., Cai & Fink, 2002).

**Socioeconomic Status**

The MacArthur Scale of Subjective Social Status (SSS; Adler et al., 2000) is a 1-item scale that assesses socioeconomic status. The scale is presented in the form of a ladder and a statement indicating that the top of the ladder indicates people with the most wealth, education, and careers in their society/country and the bottom of the ladder indicates those with the lowest wealth and resources. Participants are instructed to place themselves where they believe they are on the scale given their resources. The SSS has been validated globally with test-retest reliability rates ranging from .70 to .90. The sample in the current study produced a normal curve, as suggested by previous research (Adler et al., 2000).

**Emerging Adult Psychological Problems**

The Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 2010) is a 25-item scale that assesses broad strengths and weaknesses regarding emotional and interpersonal adjustment on a 3-point Likert scale ranging from 0 = Not True to 2 = Certainly True. Subscales include emotional symptoms (e.g., *I am often unhappy, depressed or tearful*), conduct problems (e.g., *I fight a lot. I can make other people do what I want*), hyperactivity (e.g., *I am constantly fidgeting or squirming*), peer problems (e.g., *I get along better with older people than with people of my own age*), and prosocial behavior (e.g., *I try to be nice to other people. I care about their feelings*). The SDQ has been validated in cross-cultural samples and has versions in
multiple languages. The alphas for the current study were .66 for prosocial behavior, .67 for peer problems, .65 for hyperactivity, .65 for conduct problems, and .76 for emotional problems.

**Emerging Adult Safe Sex Behavior**

The Safe Sex Behavior Questionnaire (SSBQ; Dilario et al., 1993; Turchik & Garske, 2009) is a 27-item measure that assesses sexual behaviors, such as condom use and communication regarding sex safe practices in a college-age population on a 4-point Likert scale from 1 = *Never* to 4 = *Always*. Four subscales include condom usage, sexual behaviors, high risk sexual behaviors, and sexual communication and negotiation. Sample items include *I insist on condom use when I have sexual intercourse, I have sexual intercourse with someone who injects drugs into his/her veins, and I engage in sexual intercourse on the first date*. A total sum score was created, with higher scores indicating higher levels of safe sex behavior, which resulted in an alpha of .83 for the current study.

**Emerging Adult Substance Use**

The Youth Risk Behavior Scale (YRBS; Eaton et al., 2008) is an 89-item measure that assesses health risk behaviors including eating behaviors, sleep behaviors, risky sexual behavior, and substance use. For the current study, 28 of the questions with content related to substance use were used and addressed frequency of use related to tobacco, alcohol, and marijuana use within the last 30 days and prescription drug and other illicit drug use within the last year (i.e., differences in time frame related to differences in frequency of use). Sample items include *During the last year, how many times have you used ecstasy (also called MDMA or Molly)* and *During the last month, how many times did you use marijuana*. A total sum score was created across all substance use (i.e., frequency of use within past 30 days for tobacco, alcohol, and
marijuana and last year for prescription drug and other illicit drug use) items resulting in an alpha of .83 for the current study.

**Statistical Analyses**

Cases missing greater than 5% of data across the variables were removed \((n = 469)\) as well as ages outside of the range of 18 to 29 \((n = 68)\). Variables were analyzed for assumptions and normality and met all assumptions necessary. Stochastic regression imputation using maximum-likelihood estimates was then conducted in AMOS 26.0 to replace missing values to conduct bootstrapping. To test hypothesis 1, a confirmatory factor analysis was conducted using six latent factors of the Circumplex Model (i.e., cohesion, disengaged, enmeshment, adaptability, chaotic, and rigid) indicated by loading the 7 items from each subscale onto the latent variables as shown in Figure A1 (Olson, 2011). Model fit indices of comparative fit index (CFI), Tucker-Lewis index (TLI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA) were examined for the entire sample, individual samples, geographically Western samples, and culturally individualistic samples. Modification indices were used to correlate error terms with modification index > 20. No items were deleted (e.g., poor factor loadings, item redundancy as suggested by error terms) to maintain the same model used by Olson (2011).

When the CFA failed to fit the overall data, to test hypothesis 1 and 2, a random half of the dataset was selected and an exploratory factor analyses was conducted in SPSS 26.0. Maximum likelihood method of extraction was used, with a direct oblimin rotation (Costello & Osborne, 2005). The scree plot, eigen values, and pattern matrix were examined to determine the number of factors and items per factor (O’Connor, 2000). Parallel analysis also was conducted and examined to compare eigen values and determine number of factors (Matsunaga, 2010).
Items were selected for each factor if their loading was > .5 on the factor and < .2 on any other factors (Matsunaga, 2010). The other half of the dataset was then used to conduct a CFA on the new model. Modification indices were used to delete items that did not clearly relate to their factor (i.e., low factor loading on initial factor) without highly relating to other factors (i.e., high loading on other factors) until good model fit was achieved. To examine metric invariance of the new model, a multi-group analysis (MGA) was then conducted with each sample as an individual group and an additional analysis was conducted for gender. Fit indices were used to determine configural, metric, and scalar invariance across samples and gender (Putnick & Bornstein, 2016).

To test hypothesis 3, the new model’s latent factors were imputed using maximum likelihood method in AMOS 26.0 (Figure A2). The constructs of the new model were standardized, along with collectivism/individualism, and filial piety, so that interaction terms could be created using multiplication in SPSS 26.0. All six new factors of the family dynamics model were multiplied separately with two cultural variables (i.e., collectivism and filial piety), creating 12 interaction terms. The independent variables were used to predict dependent variables of risky sexual behavior, substance use, conduct problems, internalizing problems, hyperactivity, peer problems, and prosocial behavior. All variables were analyzed within one model. To examine further interactions with gender, MGA was conducted such that each path between the independent variables and dependent variables was separately examined by gender. Z-scores were used to determine significant differences between male and female paths (Byrne, 2016).
CHAPTER IV

RESULTS

Hypothesis 1 and 2

Descriptive statistics across variables can be found in Table A5. Fit indices for each model’s CFA can be found in Table A6. Hypothesis 1 stated that confirmatory factor analysis of the overall sample, each geographic region, and participants grouped by collectivism and individualism would be tested with likely poorer fit in more eastern geographic regions and participants grouped by higher collectivism. Furthermore, hypothesis 2 stated that some models would be invariant, such that more Westernized samples would be invariant with one another and less Westernized samples would be invariant with one another. Confirmatory factor analysis of the Circumplex Model in the overall sample had poor model fit before and after correlating error terms. Similarly, the Circumplex Model did not fit in any of the individual samples, the individualistic sample, nor the geographically Western sample.

An exploratory factor analysis of a random half of the sample suggested models with between 4 and 8 factors. Parallel analysis indicated 6 factors with eigen values larger than chance. Thus, a 25-item six-factor model was examined with items that loaded > .5 on their primary factor and <. 2 (Table A7) on other factors as discussed below.

A CFA of the six-factor model revealed fit was just below adequate (i.e., CFI = .90, TLI = .88, RMSEA = .06, SRMR = .05); removal of five items that related highly to multiple factors as indicated by modification indices resulted in excellent model fit (i.e., CFI = .95, TLI = .94,
RMSEA = .04, SRMR = .04; Table A7). This resulted in a 19-item six-factor measure that can be seen in Table A7. Metric invariance was then tested using MGA for each individual sample collected. As shown in Table A9, MGA of all adequately sized samples (i.e., \( n > 100 \)) revealed \( \Delta \text{CFI} < .001, \Delta \text{RMSEA} < .001, \) and \( \Delta \text{SRMR} < .001 \), suggesting configural and metric invariance was achieved across all samples. Scalar and residual invariance were not supported, as indicated by significant changes across model fit in comparison to the metric invariance model. Similarly, gender MGA (Table A10) resulted in \( \Delta \text{CFI} < .001, \Delta \text{RMSEA} < .001, \) and \( \Delta \text{SRMR} < .001 \), also suggesting configural and metric invariance across gender, but not scalar or residual invariance. Thus, the factor loadings on constructs of the new model are similar across samples and gender reporting.

The new model consists of six variables (see Table A7) including 1) cohesive flexibility, which is a mixture of items representing both the Olson’s model cohesion and flexibility constructs and suggesting overall adaptive family functioning, 2) chaotic roles, which include items from Olson’s chaotic construct that all focus on a lack of clarity of role within family, 3) consequences, which includes items from Olson’s rigid construct specifying clarity of consequences and strictness of consequences, 4) enmeshment, which includes two of the original items from Olson’s enmeshment construct, 5) avoidance of family, which includes items from Olson’s disengaged construct regarding preference of spending time outside of the family, and 6) seldom depend, which also includes items from Olson’s disengaged construct with items focusing more on family members seldom doing things together rather than preferring to spend time apart.
**Hypothesis 3**

Hypothesis 3 stated less adaptive family model variables would be associated with poorer outcomes (e.g., higher risky sexual behavior, internalizing problems). Hypothesis 3a stated that the relation would be moderated by cultural variables of collectivism/individualism and filial piety and hypothesis 3b stated that gender would further moderate the relationship between family dynamic variables and outcomes. Across men and women in the prediction model, the covariate of race significantly predicted conduct problems ($\beta_m = 0.10, p = 0.001$; $\beta_w = 0.06, p = 0.001$) and subjective socioeconomic status significantly predicted emotional problems ($\beta_m = -0.07, p = 0.003$; $\beta_w = -0.08, p = 0.001$), hyperactivity ($\beta_m = -0.07, p = 0.01$; $\beta_w = -0.07, p = 0.001$), and peer problems ($\beta_m = -0.05, p = 0.04$; $\beta_w = -0.07, p = 0.001$). For women and not men, race was a significant covariate for safe sex behavior ($\beta_w = 0.04, p = 0.03$) and prosocial behavior ($\beta_w = -0.07, p = 0.001$). For men and not women, race was a significant covariate for hyperactivity ($\beta_m = -0.06, p = 0.04$).

Of the cultural variables for men and women (see Table A11 and Table A12), collectivism positively predicted prosocial behavior and negatively predicted peer and conduct problems, whereas filial piety positively predicted prosocial behavior and negatively predicted conduct and peer problems. For women and not men, collectivism positively predicted safe sex behavior and negatively predicted peer problems, emotional problems, and filial piety positively predicted emotional problems. Partially in support of hypothesis 3, some adaptive family variables significantly predicted lower reported behavior problems. Specifically (see Tables A13 through A18), across men and women, cohesive flexibility positively predicted prosocial behavior and negatively predicted emotional problems and hyperactivity, enmeshment positively
predicted conduct problems, consequences negatively predicted substance use, and chaotic roles positively predicted peer and conduct problems.

For women and not men, chaotic roles negatively predicted prosocial behavior, consequences positively predicted emotional and conduct problems, avoidance of family positively predicted hyperactivity, peer problems, and emotional problems, and enmeshment negatively predicted prosocial behavior. For men and not women, chaotic roles negatively predicted safe sex behavior, enmeshment positively predicted peer problems, and cohesive flexibility negatively predicted conduct problems and peer problems.

**Interactions Across Men and Women (i.e., Not Moderated by Gender)**

In support of hypothesis 3a, the relation between family model variables and emerging adult outcomes were moderated by cultural factors (See Figures A3 - A50). Specifically, of the interactions across both women and men (See Figures A3-A9), a cohesive/flexibility by filial piety interaction significantly predicted substance use (Figure A3) and safe sex behavior (Figure A4). Specifically, women reported higher substance use when cohesive/flexibility and filial piety were higher and men reported lower substance use when cohesive/flexibility and filial piety were higher. Women and men reported higher safe sex behavior when cohesive/flexibility was lower and filial piety was higher (Figure A4). The inverse (i.e. higher cohesive/flexibility and lower filial piety) also predicted higher safe sex behavior.

For men and women an enmeshment by filial piety interaction predicted prosocial behavior (Figure A5), such that men and women reported the highest prosocial behavior when enmeshment and filial piety were higher and reported lower prosocial behavior when enmeshment was higher and filial piety was lower. An enmeshment by filial piety interaction
also predicted substance use (Figure A6), such that both men and women reported the highest substance use when enmeshment was higher and filial piety was lower.

An avoidance of family by filial piety interaction significantly predicted substance use (Figure A7), such that higher avoidance of family and filial piety predicted higher substance use in women and lower substance use in men. Both men and women reporting lower filial piety did not report much change in substance use across lower and higher avoidance of family.

A seldom depend on family by filial piety interaction significantly predicted hyperactivity, such that men and women reported the highest hyperactivity when seldom depending on family was lower and filial piety was higher (Figure A8). Men and women reporting higher seldom depending on family reported similar levels of hyperactivity across filial piety.

A consequences by filial piety interaction significantly predicted safe sex behavior (Figure A9), such that lower consequences and higher filial piety predicted higher safe sex behavior for women and lowest safe sex behavior for men. Men and women reporting higher consequences reported similar levels of safe sex behavior across filial piety.

**Interactions Reported by Women Only (i.e., Further Moderated by Gender)**

For women, a cohesive/flexibility by filial piety interaction significantly predicted peer problems (Figure A10), such that the highest peer problems were associated with lower cohesive/flexibility and lower filial piety and peer problems did not change across higher levels of filial piety. A cohesive/flexibility by filial piety interaction significantly predicted hyperactivity (Figure A11), such that cohesive/flexibility related to higher hyperactivity when filial piety was lower. A cohesive/flexibility by filial piety interaction significantly predicted emotional problems (Figure A12), such that higher cohesive/flexibility predicted lower
emotional problems when filial piety was lower and had little impact on emotional problems when filial piety was higher.

A cohesive/flexibility by filial piety interaction significantly predicted conduct problem (Figure A13), such that cohesive/flexibility related to lower conduct problems in lower filial piety and higher conduct problems when filial piety was higher. A cohesive/flexibility by filial piety interaction significantly predicted prosocial behavior (Figure A14), such that the lowest prosocial behavior was when cohesive/flexibility and filial piety were lower. Cohesive/flexibility did not alter prosocial behavior when filial piety was higher. A cohesive/flexibility by collectivism interaction significantly predicted safe sex behavior (Figure A15), such that the highest safe sex behavior was when cohesive/flexibility and collectivism were both higher. A cohesive/flexibility by collectivism interaction significantly predicted conduct problems (Figure A16), such that the lowest conduct problems were when cohesive/flexibility and collectivism was higher.

An enmeshment by filial piety interaction significantly predicted hyperactivity (Figure A17), such that the highest hyperactivity was when filial piety was higher and enmeshment was lower and the lowest hyperactivity was when enmeshment and filial piety were lower. An enmeshment by filial piety interaction significantly predicted conduct problems (Figure A18), such that the highest conduct was when filial piety was lower and enmeshment was higher. An enmeshment by filial piety interaction significantly predicted safe sex behavior (Figure A19), such that lower enmeshment and higher filial piety predicted the lowest safe sex behavior. An enmeshment by collectivism interaction significantly predicted conduct problems (Figure A20), such that higher individualism and higher enmeshment related to the highest conduct problems and higher collectivism and higher enmeshment related to the lowest conduct problems.
An avoidance of family by filial piety interaction significantly predicted peer problems (Figure A21), such that the lowest peer problems were when avoidance of family was lower and filial piety was higher. An avoidance of family by filial piety interaction significantly predicted hyperactivity (Figure A22), such that the highest hyperactivity was when filial piety was higher and avoidance of family was higher. An avoidance of family by filial piety interaction predicted conduct problems (Figure A23), such that higher avoidance of family and higher filial piety predicted the highest conduct problems. An avoidance of family by filial piety interaction significantly predicted prosocial behavior (Figure A24), such that higher filial piety and lower avoidance of family predicted the highest prosocial behavior and lower avoidance of family and lower filial piety predicted the lowest prosocial behavior.

An avoidance of family by collectivism interaction predicted conduct problems (Figure A25), such that higher individualism and higher avoidance of family predicted the highest conduct problems, with little differences across higher collectivism. An avoidance of family by collectivism interaction predicted hyperactivity (Figure A26), such that higher individualism and higher avoidance of family also predicted the highest hyperactivity. An avoidance of family by collectivism interaction significantly predicted substance use (Figure A27), such that higher avoidance of family and higher collectivism predicted lower substance use.

A seldom depend on family by filial piety interaction significantly predicted substance use (Figure A28), such that the lowest substance use was reported when seldom depending on family was higher and filial piety was higher. A seldom depend on family by filial piety interaction significantly predicted conduct problems (Figure A29), such that higher seldom depending on family and lower filial piety predicted higher conduct problems and higher seldom depending on family and higher filial piety predicted lower conduct problems. A seldom depend
on family by collectivism interaction significantly predicted peer problems (Figure A30), such that higher seldom depending on family and collectivism predicted the lowest peer problems and higher seldom depending on family and individualism predicted the highest peer problems.

A chaotic roles by filial piety interaction significantly predicted substance use (Figure A31), such that the highest substance use was reported when unclear roles was higher and filial piety was lower. A chaotic roles by collectivism interaction significantly predicted hyperactivity (Figure A32), such that lower chaotic roles predicted higher hyperactivity when individualism was higher. A chaotic roles by collectivism interaction significantly predicted substance use (Figure A33), such that the highest substance use was reported when chaotic roles was higher and collectivism was higher.

**Interactions Reported by Men Only (i.e., Further Moderated by Gender)**

For men, a cohesive/flexibility by collectivism interaction significantly predicted peer problems (Figure A34) such that the lowest peer problems were when cohesive/flexibility and collectivism were higher, with similar levels of peer problems when collectivism was higher. A cohesive/flexibility by collectivism interaction significantly predicted hyperactivity (Figure A35) such that the highest hyperactivity was reported when individualism was higher and cohesive/flexibility was lower.

An enmeshment by collectivism interaction significantly predicted safe sex behavior (Figure A36), such that higher enmeshment and higher collectivism predicted higher safe sex behavior and higher enmeshment and higher individualism predicted lower safe sex behavior. An enmeshment by collectivism interaction significantly predicted hyperactivity (Figure A37), such that in the context of collectivism, higher enmeshment was associated with higher hyperactivity
and lower enmeshment was associated with lower hyperactivity, but in the context of individualism, higher enmeshment only slightly increased hyperactivity.

An avoidance of family by collectivism interaction significantly predicted safe sex behavior (Figure A38), such that higher avoidance of family and higher collectivism predicted the highest safe sex behavior. Men reporting lower avoidance of family and higher collectivism predicted lower safe sex behavior.

A seldom depend on family by filial piety interaction significantly predicted emotional problems (Figure A39), such that the highest emotional problems were reported when seldom depending on family was higher and filial piety was lower. A seldom depend on family by filial piety interaction significantly predicted prosocial behavior (Figure A40), such that when seldom depending on family was lower and filial piety was higher prosocial behavior was higher. A seldom depend on family by collectivism interaction significantly predicted prosocial behavior (Figure A41), such that the highest prosocial behavior was when seldom depending on family was higher and collectivism was higher. A seldom depend on family by collectivism interaction significantly predicted safe sex behavior (Figure A42) such that the highest safe sex behavior was reported when seldom depending on family was higher and collectivism was higher.

A consequences by filial piety interaction significantly predicted substance use (Figure A43) such that there was little change among higher consequences, but among lower consequences and higher filial piety substance use reporting was lower. A consequences by collectivism interaction significantly predicted peer problems (Figure A44), such that the lowest peer problems were reported when consequences and collectivism were higher. A consequences by collectivism interaction significantly predicted prosocial behavior (Figure A45), such that the highest prosocial behavior was reported when consequences and collectivism were higher.
A consequences by collectivism interaction significantly predicted substance use (Figure A46) such that higher consequences and higher collectivism resulted in lower substance use, with less impact on men reporting higher individualism. A consequences by collectivism interaction significantly predicted conduct problems (Figure A47) such that consequences related to an increase in conduct problems when individualism was higher and related to a decrease in conduct problems when collectivism was higher. A consequences by collectivism interaction significantly predicted emotional problems (Figure A48), such that higher consequences related to an increase in emotional problems when individualism was higher and related to a decrease in emotional problems when collectivism was higher.

A chaotic roles by filial piety interaction significantly predicted emotional problems (Figure A49) such that in the context of higher filial piety, lower unclear roles related to the lowest emotional problems and higher unclear roles are related to the highest emotional problems. A chaotic roles by collectivism interaction significantly predicted emotional problems (Figure A50) such that in the context of higher unclear roles, higher individualism relates to higher emotional problems and higher collectivism relates to lower emotional problems.

**Notable Path Differences by Gender Worth Highlighting**

In partial support of hypothesis 3b, some paths were significantly moderated by gender, but did not specifically support that less adaptive family dynamics predicted higher externalizing problems in males and higher internalizing problems in females. Of the paths moderated by gender, the relation between cohesive/flexibility and hyperactivity was negative for males and positive for females ($Z = -2.80, p < .05$) and the relation between cohesive/flexibility and conduct was negative for males and positive for females ($Z = -2.06, p < .05$). Additionally, the relation between enmeshment and emotional problems was positive for males and negative for
females ($Z = 2.42, p < .05$). Furthermore, several interactions already noted above were further moderated by gender, suggesting a 3-way interaction, such that interactions were significant for one gender and not the other, or interactions were opposite to one another.
CHAPTER V
DISCUSSION

Discussion

Hypothesis 1 and 2

The results of the current study suggest the Olson’s Circumplex Model of Family Functioning does not achieve adequate fit across a global sample, as hypothesized. Unexpectedly, the model also did not fit within the individual samples collected, including samples from similar regions collected for the validation of the FACES-IV (Olson, 2011). The samples collected in the current study may not directly reflect the samples collected in the FACES-IV validation study including cohort effects. Additionally, although a new model was able to be created, replication is key to determining the likelihood of a new model.

However, the constructs were relatively similar to Olson’s Circumplex Model with some notable differences. Specifically, Olson’s Circumplex Model consists of six constructs on dimensions of adaptability (i.e., flexibility, chaotic, and rigid) and cohesion (i.e., cohesion, disengaged, and enmeshment). The new model also consists of six constructs, starting with cohesive/flexibility which reflects both cohesion and flexibility constructs, suggestive of an overall adaptive family functioning construct. Along the dimension of cohesion, enmeshment remained the same with fewer items in the new construct and disengagement broke into two separate constructs, one suggestive of preferring to spend time with others outside of the family (i.e., avoidance of family) and one suggestive of rarely spending time with family members (i.e.,
seldom depend on family). Chaotic adaptability became chaotic roles, with questions focusing on chaotic leadership in the family, whereas rigid adaptability became consequences with questions focusing on strict clear consequences for actions in the family. The final new model resulted in a 19-question survey that had good fit across the entire sample and was not significantly different within individual samples (i.e., metric invariance). Given that there is some consistency between the new model and Olson’s Circumplex Model, global family dynamics may not be as different as expected and may not be as regionally or culturally discriminant as expected. Indeed, the newly identified model demonstrated invariance across samples regardless of region or culture, although they related to outcomes differentially by culture.

**Hypothesis 3**

*Cohesive/Flexibility*

As hypothesized, the new model significantly related to emerging adult outcomes, and those relations were influenced by factors of culture and gender. More specifically, cohesive/flexibility related to higher prosocial behavior and lower hyperactivity and emotional problems in men and women, as well as lower peer and conduct problems in men alone, as expected given literature supporting adaptive family functioning relating to better outcomes (Devi et al., 2017). However, cohesive/flexibility was highly influenced by culture, such that in the context of high filial piety cohesive/flexibility has less of an influence on certain outcomes (i.e., smaller decreases in outcome variables of hyperactivity, emotional problems, prosocial behaviors, conduct problems) for women. Specifically, cohesive/flexibility related to better outcomes in the context of lower filial piety. In contrast, men reporting both higher cohesive/flexibility and higher filial piety generally reported the better outcomes (e.g., lowest substance use).
In the context of higher collectivism, women reported the highest safe sex behaviors with high cohesive/flexibility and the lowest conduct problems when both cohesive/flexibility and collectivism were higher; men reported the lowest peer problems and the lowest hyperactivity with both higher collectivism and higher cohesive/flexibility suggesting both are important in these outcomes for men and women. Although cohesive/flexibility is considered the highest of adaptive family dynamics, it appears to play less of a role in the context of higher filial piety or collectivism on specific outcomes and may be important to consider as aspects of intervention based on family culture. Specifically, families with cultures with higher filial piety or collectivism may not consider what is captured in cohesive/flexibility to be as high of a priority in family functioning and the norms of that region/culture may influence cohesive/flexibility on outcomes (Brown et al., 2018).

Enmeshment

Regarding enmeshment, men and women reporting higher enmeshment reported higher conduct problems, men alone reported higher peer problems, and women reported lower prosocial behavior. However, in the context of filial piety, men and women reported the highest prosocial behavior when they reported both higher filial piety and higher enmeshment. Similarly, high enmeshment and high filial piety predicted lower substance use in men and women, whereas high enmeshment with low filial piety predicted the highest substance use for men and women, once again suggesting culture significantly impacts the relation between family dynamics and certain outcomes. Furthermore, women reporting both higher filial piety and enmeshment reported the highest safe sex behavior; women reporting higher filial piety and lower enmeshment reported the highest hyperactivity, and women reporting lower filial piety and higher enmeshment reported the highest conduct problems. In the context of higher collectivism
and enmeshment, women reported the lowest conduct problems and men reported the highest safe sex behaviors. Of interest, previous research has significant evidence supporting that enmeshment is linked to substance use (e.g., Protinksy & Shuts, 1990), but the current study provides tentative support that culture directly modulates this relation (Pirutinksy & Kor, 2013). Although enmeshment has been shown to relate to negative outcomes (e.g., Simpson et al., 2018), in the context of filial piety or collectivism it may be protective or nullified by cultural norms.

**Avoidance of Family**

Avoidance of family related to higher peer problems, emotional problems, and hyperactivity in women. This finding relates to previous research suggesting disengagement from family typically relates to increases in relationships with deviant peers which is associated with peer difficulties (Blackson, Tarter, Loeber et al., 1996; Dishion et al., 2004). Furthermore, avoidance of family for women may be more impactful, as discussed in previous research, and thus may be more likely to result in emotional difficulties (Beyers & Seiffge-Krenke, 2007). In the context of higher filial piety, higher report of avoidance of family related to poorer outcomes (e.g., peer problems, conduct problems) for women. In contrast, women reported higher prosocial behavior in the context of higher avoidance of family and higher filial piety than in the context of low avoidance and filial piety, suggesting that high filial piety may be a protective factor for the peer relationships women develop outside of the family even when they actively avoid their family members (Ma et al., 2007).

Similarly, men reporting low avoiding family and low filial piety reported higher substance use than men reporting higher filial piety and higher avoiding family, once again suggesting either filial piety as a generalizable factor or an outside variable explaining the
relationship. This finding was the same in the context of collectivism, such that women reported the lowest substance use with high avoiding family and higher collectivism and men reported the highest safe sex behavior with higher avoiding family and higher collectivism. Given the phrasing of one of the items on the avoiding family subscale, it may be that some people reporting higher avoiding family may be more prosocial and independent outside of their family than within and thus more successful in the above outcomes. Finally, women reporting high avoidance of family in the context of higher individualism reported the highest hyperactivity and the highest conduct problems, suggesting that for these externalizing outcomes women in individualistic cultures may be more impacted by family relationships (Beyers & Seiffge-Krenke, 2007).

**Seldom Depend on Family**

In the context of higher filial piety, higher report of seldom depending on family related to the lower substance use and conduct problems in women, whereas men reported lower emotional problems. Men and women also reported the lowest hyperactivity when reporting lower filial piety and lower seldom depending, suggesting emerging adults reporting higher hyperactivity may be more likely to depend on their family members, particularly when reporting higher filial piety. Additionally, men reported the highest prosocial behavior when reporting higher filial piety and lower seldom depending on family, which is somewhat in contrast with men reporting the highest prosocial behavior in the context of higher collectivism and higher seldom depending, potentially suggesting collectivism as an important socialization factor for men regardless of family dynamic and filial piety depending more on amount of time spent with family members. Finally, men reported the highest safe sex behavior when reporting lower seldom depending and higher collectivism and the lowest safe sex behavior when reporting...
higher seldom depending and lower collectivism. The inconsistencies in some of these interactions may be explained by other internal factors (e.g., impulsivity, psychopathology, knowledge, etc.) and require further study to better interpret.

**Consequences**

Higher consequences related to lower substance use in men and women, higher emotional and conduct problems in women. Relating to previous research, parents who engage in more control-oriented behaviors may decrease risk of health risk behaviors in emerging adult children, but may potentially be at the expense of other factors such as positive socialization or emotional difficulties (e.g., Moussa Rogers & McKinney, 2019). In the context of filial piety, men and women reporting higher consequences reported higher safe sex behavior regardless of filial piety, but when lower consequences were reported women reported higher safe sex behavior with higher filial piety, whereas men reported lower safe sex behavior with higher filial piety.

Somewhat similarly, when men reported lower consequences, they reported lower substance use in the context of higher filial piety. This seems to suggest filial piety may be somewhat protective in the context of lower consequences for men and women for different behaviors (i.e., substance use for men and safe sex behavior for women), which may be relevant to gender norms (e.g., safe sex behavior is less focused on for men; Teitelman et al., 2008). In the context of higher collectivism, men reporting higher consequences reported higher prosocial behavior, lower peer problems, lower substance use, and lower conduct problems, which may suggest consequences may matter more to men in collectivist societies in relation to these outcomes and somewhat less to men in more individualistic societies.
Chaotic Roles

Finally, chaotic roles related to higher conduct problems and peer problems in men and women, lower safe sex behavior in men, and lower prosocial behavior in women. This matches previous research suggesting chaotic dynamics, associated with inconsistent parenting, may relate to externalizing outcomes and difficulties in prosocial behavior (Simons & Conger, 2007; Stoneman et al., 1989). In the context of higher filial piety, men reporting higher chaotic roles reported the highest emotional problems, whereas women reporting higher chaotic roles reported lower substance use. Similar to discussions above, chaotic roles may relate to higher substance use for women, but may be buffered by higher filial piety, with little difference occurring in the context of lower filial piety.

In the context of higher collectivism, women reporting higher chaotic roles reported higher substance use, with chaotic roles having less of an impact when women reported lower collectivism (i.e., higher individualism). Furthermore, women reported high chaotic roles related to high levels of hyperactivity regardless of culture, but when chaotic roles were low collectivism related to the lowest levels of reported hyperactivity. Men reporting higher individualism and higher chaotic roles reported higher emotional problems and higher conduct problems, with higher collectivism acting as a partial buffer for both of these outcomes.

Overall, it is clear that cultural factors play an important role in determining how family factors relate to emerging adult outcomes, suggesting more clinical research should focus on these interactions to facilitate parsing out the mechanisms behind these relations. Although there wasn’t always a clear direction in the interactions, in line with previous research (e.g., Pirutinsky & Kor, 2013), family dynamics of enmeshment and strict consequences do not have the same degree of negative consequences in the context of collectivism or filial piety. Similarly,
cohesive/flexibility cannot be applied with the same broad strokes in the context of collectivism or filial piety, and cohesive/flexibility does not guarantee positive outcomes as implied by research conducted with more individualistic samples.

**Limitations**

Although a relatively large and diverse sample, and similar in age to samples used in previous validation studies (e.g., Olson, 2011), the use of a cross-sectional sample of college attending emerging adults has limitations. Samples of similar age groups that are not in college may report different family dynamics from the current sample that may influence the validation of the Circumplex Model or the new model. Furthermore, the use of samples with younger children or with parent report may further change the outcome of validation of either model. Additionally, the use of the FACES-IV may be a limitation such that there may be facets of family dynamics that were not addressed in the measure for our global sample, particularly in consideration of language barriers. Specifically, qualitative research on family dynamics with other cultures and languages may better assist in describing the family dynamics of other cultures than the use of an English-validated model and measure. Given that the Circumplex Model has multiple validation studies in support of it, it is important that replication occurs to determine if this new model continues to better represent diverse samples of family dynamics. Furthermore, given that certain aspects of the previous validation studies methodologies were not known to the current authors, it is difficult to determine if the same analysis procedure was followed and thus difficult to say whether the current study was able to replicate the Circumplex Model adequately. Finally, given that the data was cross-sectional the relations in the prediction model cannot be discussed as causal and require further replication and examination to better determine family dynamics relation to emerging adult outcomes in the context of cultural factors.
Strengths

The current study had a large sample size across multiple countries, geographic regions, and report varied cultural values across collectivism/individualism and filial piety. Thus, the current study is novel in its examination of Olson’s Circumplex Model in a cross-cultural sample (Pirutinksy & Kor, 2013). The validation study for the FACES-IV was largely made up of emerging adult aged individuals and thus the current study is not very dissimilar in its validation population and may merit legitimacy in the development of the new model (Olson et al., 2011). Moreover, the use of collaborators across the world increased the cultural sensitivity of the research design and measures used as questions were examined by researchers native to those regions and languages (Valsiner, 2007). The creation of a global model suggests that geographic regions may play far less of an important role than we assume in intervention and that cultural factors should be more highly valued in research and intervention.

Conclusions

Considering the use of Olson’s Circumplex Model and the FACES-IV in clinical application and practice, particularly for family therapy, the current study may provide some insight into its utility and interpretation, particularly with diverse families. In a world increasing in globalization and shifting in cultural standards, assessment of cultural factors that may be relevant to a family (e.g., filial piety, collectivism/individualism) may be important to psychodiagnosics and intervention targets. Specifically, families presenting with higher collectivism or filial piety may be less impacted by targeting adaptive family functioning (i.e., cohesion and flexibility). Similarly, targeting enmeshment or rigid consequences in families reporting higher collectivism or filial piety may be contraindicated and may result in worse outcomes. Finally, replication is required before use of the new model, but replication is
optimistic given the creation of a global model with good fit, but may be further benefitted by mixed methods (i.e., qualitative and quantitative) in global samples. Overall, the current study demonstrated that cross-cultural research benefits the understanding of clinical models currently in use and specifically cultural factors are useful in understanding family dynamics and outcomes and require further examination to better facilitate clinical research and application.
REFERENCES


APPENDIX A

TABLES AND FIGURES
Table A1

*Participant Country Breakdown*

<table>
<thead>
<tr>
<th>Country Born</th>
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Table A2

Demographics of Individual Participants

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Table A3

*Additional Participant Demographics*

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### Participant Caregiver Information

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<td>1-2 hours daily</td>
<td>1026</td>
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<td>2-5 hours daily</td>
<td>600</td>
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<tr>
<td>5-10 hours daily</td>
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<td>&gt;10 hours daily</td>
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<table>
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<th>Hours Talk/Spent Primary Father/Caregiver</th>
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</thead>
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<td>0-1 hours daily</td>
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<td>1-2 hours daily</td>
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<td>2-5 hours daily</td>
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<td>5-10 hours daily</td>
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<td>&gt;10 hours daily</td>
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Table A5

*Descriptive Statistics*

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<td>TLI</td>
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<td>-----</td>
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*Note: Subscript for fit indices indicates pre and post error terms correlated. Subscript for samples indicate separate universities within the same state of the United States.*
### Table A7

**Final 6-Factor Solution with Factor Loadings**

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<td>Cohesive/Flexibility</td>
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</tr>
<tr>
<td>19</td>
<td>Family members consult other family members on important decisions</td>
<td>Cohesive/Flexibility</td>
<td>0.62</td>
</tr>
<tr>
<td>20</td>
<td>My family is able to adjust to change when necessary</td>
<td>Cohesive/Flexibility</td>
<td>0.71</td>
</tr>
<tr>
<td>25</td>
<td>Family members like to spend some of their free time with each other</td>
<td>Cohesive/Flexibility</td>
<td>0.70</td>
</tr>
<tr>
<td>31</td>
<td>Although family members have individual interests, they still participate in family activities</td>
<td>Cohesive/Flexibility</td>
<td>0.68</td>
</tr>
<tr>
<td>37</td>
<td>Our family has a good balance of separateness and closeness</td>
<td>Cohesive/Flexibility</td>
<td>0.69</td>
</tr>
<tr>
<td>12</td>
<td>It is hard to know who the leader is in our family</td>
<td>Chaotic Roles</td>
<td>0.65</td>
</tr>
<tr>
<td>24</td>
<td>It is unclear who is responsible for things (chores, activities) in our family</td>
<td>Chaotic Roles</td>
<td>0.60</td>
</tr>
<tr>
<td>30</td>
<td>There is no leadership in our family</td>
<td>Chaotic Roles</td>
<td>0.83</td>
</tr>
<tr>
<td>11</td>
<td>There are clear consequences when a family member does something wrong</td>
<td>Consequences</td>
<td>0.73</td>
</tr>
<tr>
<td>5</td>
<td>There are strict consequences for breaking the rules in our family</td>
<td>Consequences</td>
<td>0.86</td>
</tr>
<tr>
<td>4</td>
<td>We spend too much time together</td>
<td>Enmeshment</td>
<td>0.63</td>
</tr>
<tr>
<td>28</td>
<td>We feel too connected to each other</td>
<td>Enmeshment</td>
<td>0.76</td>
</tr>
<tr>
<td>9</td>
<td>Family members seem to avoid contact with each other when at home</td>
<td>Avoid Family</td>
<td>0.72</td>
</tr>
<tr>
<td>3</td>
<td>We get along better with people outside our family than inside</td>
<td>Avoid Family</td>
<td>0.58</td>
</tr>
<tr>
<td>39</td>
<td>Family members mainly operate independently</td>
<td>Avoid Family</td>
<td>0.50</td>
</tr>
<tr>
<td>33</td>
<td>Family members seldom depend on each other</td>
<td>Seldom Depend</td>
<td>0.67</td>
</tr>
<tr>
<td>27</td>
<td>Our family seldom does things together</td>
<td>Seldom Depend</td>
<td>0.75</td>
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</table>
Table A8

*Multi-Group Analysis Fit Indices Across Individual Samples*

<table>
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<tr>
<th>Model</th>
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<th>RMSEA</th>
<th>SRMR</th>
<th>$X^2$(df)</th>
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<tbody>
<tr>
<td>Unconstrained</td>
<td>0.93</td>
<td>0.01</td>
<td>0.05</td>
<td>3408.20 (2055)</td>
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<tr>
<td>Metric Invariance</td>
<td>0.92</td>
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<td>Scalar Invariance</td>
<td>0.89</td>
<td>0.02</td>
<td>0.09</td>
<td>4686.67 (2531)</td>
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Table A9

*Multi-Group Analysis Fit Indices Across Gender*

<table>
<thead>
<tr>
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<th>RMSEA</th>
<th>SRMR</th>
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</tr>
</thead>
<tbody>
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<td>0.03</td>
<td>0.05</td>
<td>3650.40 (2055)</td>
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<td>Metric Invariance</td>
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<td>0.03</td>
<td>0.05</td>
<td>3889.54 (2237)</td>
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<tr>
<td>Scalar Invariance</td>
<td>0.94</td>
<td>0.03</td>
<td>0.10</td>
<td>4946.58 (2531)</td>
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Table A10

*Direct Standardized Effects of Collectivism on Outcome Variables*

<table>
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<th>Women</th>
</tr>
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<td>$b$</td>
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<tr>
<td>Safe Sex Behavior</td>
<td>0.06</td>
<td>0.32</td>
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<tr>
<td>Substance Use</td>
<td>0.04</td>
<td>0.52</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>0.28</td>
<td>0.0001</td>
</tr>
<tr>
<td>Peer Problems</td>
<td>-0.15</td>
<td>0.004</td>
</tr>
<tr>
<td>Conduct Problems</td>
<td>-0.10</td>
<td>0.05</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>-0.06</td>
<td>0.25</td>
</tr>
<tr>
<td>Emotional Problems</td>
<td>-0.03</td>
<td>0.55</td>
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Table A11

*Direct Standardized Effects of Filial Piety on Outcome Variables*

<table>
<thead>
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<th>Women</th>
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</thead>
<tbody>
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<td></td>
<td>$b$</td>
<td>$p$</td>
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<tr>
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<td>-0.04</td>
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<td>Substance Use</td>
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</tr>
<tr>
<td>Prosocial Behavior</td>
<td>0.29</td>
<td>0.0001</td>
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<tr>
<td>Peer Problems</td>
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<tr>
<td>Conduct Problems</td>
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<td>0.01</td>
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<tr>
<td>Hyperactivity</td>
<td>0.02</td>
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Table A12

*Direct Standardized Effects of Cohesive/Flexibility on Outcome Variables*

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<td><em>b</em></td>
<td><em>p</em></td>
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<td>0.006</td>
<td>0.09</td>
<td>0.007</td>
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<td>0.0001</td>
<td>-0.06</td>
<td>0.10</td>
</tr>
<tr>
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<td>-0.05</td>
<td>0.17</td>
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<tr>
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<td>0.0001</td>
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Table A13

*Direct Standardized Effects of Enmeshment on Outcome Variables*

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<th></th>
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<td><em>p</em></td>
<td><em>b</em></td>
<td><em>p</em></td>
</tr>
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<td>0.51</td>
<td>0.05</td>
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<td>Prosocial Behavior</td>
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<td>0.71</td>
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<tr>
<td>Peer Problems</td>
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<td>0.36</td>
<td>0.09</td>
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<tr>
<td>Conduct Problems</td>
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<tr>
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<td>Emotional Problems</td>
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**Table A14**

*Direct Standardized Effects of Avoiding Family on Outcome Variables*

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<tbody>
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<td><em>p</em></td>
</tr>
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<td>0.58</td>
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<tr>
<td>Substance Use</td>
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<td>Prosocial Behavior</td>
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<td>0.76</td>
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<td>Peer Problems</td>
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<td>0.0001</td>
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<tr>
<td>Conduct Problems</td>
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<td>0.0001</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>0.01</td>
<td>0.96</td>
</tr>
<tr>
<td>Emotional Problems</td>
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**Table A15**

*Direct Standardized Effects of Seldom Depending on Outcome Variables*

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<tbody>
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<tr>
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<td>0.20</td>
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<tr>
<td>Substance Use</td>
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<td>0.04</td>
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<tr>
<td>Prosocial Behavior</td>
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<td>0.59</td>
</tr>
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<td>Peer Problems</td>
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<td>0.92</td>
</tr>
<tr>
<td>Conduct Problems</td>
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<td>0.06</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>0.06</td>
<td>0.27</td>
</tr>
<tr>
<td>Emotional Problems</td>
<td>0.05</td>
<td>0.28</td>
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Table A16

*Direct Standardized Effects of Consequences on Outcome Variables*

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<tbody>
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<td></td>
<td><em>b</em></td>
<td><em>p</em></td>
</tr>
<tr>
<td>Safe Sex Behavior</td>
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<td>0.90</td>
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<td>Substance Use</td>
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<td>Prosocial Behavior</td>
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<td>Peer Problems</td>
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<td>Conduct Problems</td>
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<td>Emotional Problems</td>
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</table>

Table A17

*Direct Standardized Effects of Chaotic Roles on Outcome Variables*

<table>
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<tr>
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<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>b</em></td>
<td><em>p</em></td>
</tr>
<tr>
<td>Safe Sex Behavior</td>
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</tr>
<tr>
<td>Substance Use</td>
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<td>0.52</td>
</tr>
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<td>Prosocial Behavior</td>
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<td>0.18</td>
</tr>
<tr>
<td>Peer Problems</td>
<td>0.15</td>
<td>0.01</td>
</tr>
<tr>
<td>Conduct Problems</td>
<td>0.14</td>
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</tr>
<tr>
<td>Hyperactivity</td>
<td>0.08</td>
<td>0.19</td>
</tr>
<tr>
<td>Emotional Problems</td>
<td>0.09</td>
<td>0.13</td>
</tr>
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</table>
Figure A1. Confirmatory Factor Analysis of the Circumplex Model

Note that all constructs are freely correlated with each other although some correlation arrows are omitted for clarity.
Figure A2. Path Analysis Conceptual Model

Path analysis with interaction terms between Circumplex Model variables and cultural variables resulting in 12 interaction terms predicting 7 separate emerging adult outcomes in one model, as well as an interaction between gender and Circumplex Model variables resulting in 6 interaction terms. Socioeconomic status and ethnicity included as covariates.
Figure A3.  *Family Cohesive/Flexibility x Filial Piety on Emerging Adult Substance Use*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult substance use

Figure A4.  *Family Cohesive/Flexibility x Filial Piety on Emerging Adult Safe Sex Behavior*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult safe sex behavior
Figure A5. Family Enmeshment x Filial Piety on Emerging Adult Prosocial Behavior
Graph depicting enmeshment x filial piety interaction on emerging adult prosocial behavior

Figure A6. Family Enmeshment x Filial Piety on Emerging Adult Substance Use
Graph depicting family enmeshment x filial piety interaction on emerging adult substance use
Figure A7. *Avoidance of Family x Filial Piety on Emerging Adult Substance Use*

Graph depicting avoidance of family x filial piety interaction on emerging adult substance use

Figure A8. *Seldom Depend on Family x Filial Piety on Emerging Adult Hyperactivity*

Graph depicting seldom depend on family x filial piety interaction on emerging adult hyperactivity
Figure A9. Consequences x Filial Piety on Emerging Adult Safe Sex Behavior

Graph depicting consequences x filial piety interaction on emerging adult safe sex behavior

Figure A10. Family Cohesive/Flexibility x Filial Piety on Emerging Adult Peer Problems

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult peer problems
Figure A11.  *Family Cohesive/Flexibility x Filial Piety on Emerging Adult Hyperactivity*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult hyperactivity

Figure A12.  *Family Cohesive/Flexibility x Filial Piety on Emerging Adult Emotional Problems*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult emotional problems
Figure A13.  *Family Cohesive/Flexibility x Filial Piety on Emerging Adult Conduct Problems*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult conduct problems

Figure A14.  *Cohesive/Flexibility x Filial Piety on Emerging Adult Prosocial Behavior*

Graph depicting cohesive/flexibility x filial piety interaction on emerging adult prosocial behavior
Figure A15.  *Family Cohesive/Flexibility x Collectivism on Emerging Adult Safe Sex Behavior*

Graph depicting cohesive/flexibility x collectivism interaction on emerging adult safe sex behavior

Figure A16.  *Family Cohesive/Flexibility x Collectivism on Emerging Adult Conduct Problems*

Graph depicting cohesive/flexibility x collectivism interaction on emerging adult conduct problems
Figure A17.  *Family Enmeshment x Filial Piety on Emerging Adult Hyperactivity*

Graph depicting enmeshment x filial piety interaction on emerging adult hyperactivity

Figure A18.  *Family Enmeshment x Filial Piety on Emerging Adult Conduct Problems*

Graph depicting enmeshment x filial piety interaction on emerging adult conduct problems
Figure A19.  *Family Enmeshment x Filial Piety on Emerging Adult Safe Sex Behavior*
Graph depicting enmeshment x filial piety interaction on emerging adult safe sex behavior

Figure A20.  *Family Enmeshment x Collectivism on Emerging Adult Conduct Problems*
Graph depicting enmeshment x collectivism interaction on emerging adult conduct problems
**Figure A21. Avoidance of Family x Filial Piety on Emerging Adult Peer Problems**

Graph depicting avoidance of family x filial piety interaction on emerging adult peer problems

**Figure A22. Avoidance of Family x Filial Piety on Emerging Adult Hyperactivity**

Graph depicting avoidance of family x filial piety interaction on emerging adult hyperactivity
Figure A23.  *Avoidance of Family x Filial Piety on Emerging Adult Conduct Problems*

Graph depicting avoidance of family x filial piety interaction on emerging adult conduct problems

Figure A24.  *Avoidance of Family x Filial Piety on Emerging adult Prosocial Behavior*

Graph depicting avoidance of family x filial piety interaction on emerging adult prosocial behavior
Figure A25. Avoidance of Family x Collectivism on Emerging Adult Conduct Problems

Graph depicting avoidance of family x collectivism interaction on emerging adult conduct problems

Figure A26. Avoidance of Family x Collectivism on Emerging Adult Hyperactivity

Graph depicting avoidance of family x collectivism interaction on emerging adult hyperactivity
Figure A27. Avoidance of Family x Collectivism on Emerging Adult Substance Use
Graph depicting avoidance of family x collectivism interaction on emerging adult substance use

Figure A28. Seldom Depend on Family x Filial Piety on Emerging Adult Substance Use
Graph depicting seldom depend on family x filial piety interaction on emerging adult substance use
Figure A29.  *Seldom Depend on Family x Filial Piety on Emerging Adult Conduct Problems*

Graph depicting seldom depend on family x filial piety interaction on emerging adult conduct problems

Figure A30.  *Seldom Depend on Family x Collectivism on Emerging Adult Peer Problems*

Graph depicting seldom depend on family x collectivism interaction on emerging adult peer problems
Figure A31. Chaotic Roles x Filial Piety on Emerging Adult Substance Use
Graph depicting chaotic roles x filial piety interaction on emerging adult substance use.

Figure A32. Chaotic Roles x Collectivism on Emerging Adult Hyperactivity
Graph depicting chaotic roles x collectivism interaction on emerging adult hyperactivity.
Figure A33.  Chaotic Roles x Collectivism on Emerging Adult Substance Use

Graph depicting chaotic roles x collectivism interaction on emerging adult substance use

Figure A34.  Cohesive/Flexibility x Collectivism on Emerging Adult Peer Problems

Graph depicting cohesive/flexibility x collectivism interaction on emerging adult peer problems
Figure A35.  Cohesive/Flexibility x Collectivism on Emerging Adult Hyperactivity

Graph depicting cohesive/flexibility x collectivism interaction on emerging adult hyperactivity

Figure A36.  Family Enmeshment x Collectivism on Emerging Adult Safe Sex Behavior

Graph depicting enmeshment x collectivism interaction on emerging adult safe sex behavior
Figure A37.  *Family Enmeshment x Collectivism on Emerging Adult Hyperactivity*

Graph depicting enmeshment x collectivism interaction on emerging adult hyperactivity

Figure A38.  *Avoidance of Family x Collectivism on Emerging Adult Safe Sex Behavior*

Graph depicting avoidance of family x collectivism interaction on emerging adult safe sex behavior
Figure A39.  **Seldom Depend on Family x Filial Piety on Emerging Adult Emotional Problems**

Graph depicting seldom depend on family x filial piety interaction on emerging adult emotional problems

Figure A40.  **Seldom Depend on Family x Filial Piety on Emerging Adult Prosocial Behavior**

Graph depicting seldom depend on family x filial piety interaction on emerging adult prosocial behavior
Figure A41.  *Seldom Depend on Family x Collectivism on Emerging Adult Prosocial Behavior*

Graph depicting seldom depend on family x collectivism interaction on emerging adult prosocial behavior.

Figure A42.  *Seldom Depend on Family x Collectivism on Emerging Adult Safe Sex Behavior*

Graph depicting seldom depend on family x collectivism interaction on emerging adult safe sex behavior.
Figure A43.  Consequences x Filial Piety on Emerging Adult Substance Use

Graph depicting consequences x filial piety interaction on emerging adult substance use

Figure A44.  Consequences x Collectivism on Emerging Adult Peer Problems

Graph depicting consequences x collectivism interaction on emerging adult peer problems
Figure A45.  Consequences x Collectivism on Emerging Adult Prosocial Behavior

Graph depicting consequences x collectivism interaction on emerging adult prosocial behavior

Figure A46.  Consequences x Collectivism on Emerging Adult Substance Use

Graph depicting consequences x collectivism interaction on emerging adult substance use
Figure A47. *Consequences x Collectivism on Emerging Adult Conduct Problems*

Graph depicting consequences x collectivism interaction on emerging adult conduct problems

Figure A48. *Consequences x Collectivism on Emerging Adult Emotional Problems*

Graph depicting consequences x collectivism interaction on emerging adult emotional problems
Figure A49. Chaotic Roles x Filial Piety on Emerging Adult Emotional Problems
Graph depicting chaotic roles x filial piety interaction on emerging adult emotional problems

Figure A50. Chaotic Roles x Collectivism on Emerging Adult Emotional Problems
Graph depicting chaotic roles x collectivism interaction on emerging adult emotional problems
APPENDIX B

IRB APPROVAL
Rogers, Mary

From: prm199@msstate.edu
Sent: Wednesday, October 3, 2018 3:28 PM
To: cm998@msstate.edu; aco58@msstate.edu; mbm364@msstate.edu
Subject: Approval Notice for Study # IRB-18-362, Cross Cultural Family Dynamics

Protocol ID: IRB-18-362
Principal Investigator: Clifford McKinney
Protocol Title: Cross Cultural Family Dynamics
Review Type: EXEMPT
Approval Date: October 03, 2018
Expiration Date: October 02, 2023

The above referenced study has been approved. To access your approval documents, log into myProtocol and click on the protocol number to open the approved study. Your official approval letter can be found under the Event History section. For non-exempt approved studies, all stamped documents (e.g., consent, recruitment) can be found in the Attachment section and are labeled accordingly.

If you have any questions that the HRPP can assist you in answering, please do not hesitate to contact us at irb@research.msstate.edu or 601.325.3364.
APPENDIX C

MEASURES
Demographics Form

Please complete each question to the best of your knowledge either by circling the appropriate answer or filling in the appropriate description.

1. What is your age (in years)?
2. With which gender do you most identify?
3. In which country were you born?
4. If from the United States, in which state were you born?
5. In which country do you currently reside?
6. If from the United States, in which state do you currently reside?
7. How long have you lived in the country you currently reside (in years)?
8. Please indicate your ethnicity (i.e. peoples’ ethnicity describes their feeling of belonging and attachment to a distinct group of a larger population that shares their ancestry, color, language or religion):
9. What is your race?
10. Who lived in the same home as you when you were a CHILD? Please circle all that apply.
   a. Biological Father
   b. Grandfather
   c. Uncle
   d. Mother
   e. Aunt
   f. Adoptive father
   g. Step father
   h. Foster father
   i. Adoptive mother
   j. Step mother
   k. Foster mother
   l. Grandmother
   m. Grandfather
11. Who lives in the same home as you NOW? Please circle all that apply.
   a. Biological Father
   b. Grandfather
   c. Uncle
   d. Mother
   e. Aunt
   f. Adoptive father
   g. Step father
   h. Foster father
   i. Adoptive mother
   j. Step mother
   k. Foster mother
   l. Grandmother
   m. Grandfather

12. Who is your primary caregiver, or takes care of you the most?
   a. Biological Father
   b. Grandfather
   c. Uncle
   d. Mother
   e. Aunt
   f. Adoptive father
   g. Step father
   h. Foster father
   i. Adoptive mother
   j. Step mother
   k. Foster mother
   l. Grandmother
   m. Grandfather

13. Are your primary caregivers same-sex parents?
14. How many **hours per day** do you spend with or talk to your parents:

   a. Father
      
      0-1 hours daily, 1-2 hours daily, 2-5 hours daily, 5-10 hours daily, > 10 hours daily

   b. Mother
      
      0-1 hours daily, 1-2 hours daily, 2-5 hours daily, 5-10 hours daily, > 10 hours daily
15. Think of this ladder as representing where people stand in your country.

At the **top** of the ladder are the people who are the best off - those who have the most money, the most education, and the most respected jobs. At the **bottom** are the people who are the worst off - who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.
16. Father’s highest level of education:
   a. Doctoral degree
   b. Masters degree
   c. Bachelor degree
   d. Associates degree
   e. High school diploma/GED
   f. If none of the above, please indicate highest grade completed: ____

17. Mother’s highest level of education:
   a. Doctoral degree
   b. Masters degree
   c. Bachelor degree
   d. Associates degree
   e. High school diploma/GED
   f. If none of the above, please indicate highest grade completed: ____

18. What religious denomination describes you the best now?
   a. Christian other: _________
   b. Jewish
   c. Hindu
   d. Catholic
   e. Buddhist
   f. Gnostic
   g. Atheist
   h. Islam
   i. Neo-Pagan
j. Baptist

k. Protestant

l. Spiritual

m. Other: _________
FACES-IV

1 = Strongly Disagree to 5 = Strongly Agree
1. Family members are involved in each other's lives.
2. Our family tries new ways of dealing with problems.
3. We get along better with people outside our family than inside.
4. We spend too much time together.
5. There are strict consequences for breaking the rules in our family.
6. We never seem to get organized in our family.
7. Family members feel very close to each other.
8. Parents equally share leadership in our family.
9. Family members seem to avoid contact with each other when at home.
10. Family members feel pressured to spend most free time together.
11. There are clear consequences when a family member does something wrong.
12. It is hard to know who the leader is in our family.
13. Family members are supportive of each other during difficult times.
14. Discipline is fair in our family.
15. Family members know very little about the friends of other family members.
16. Family members are too dependent on each other.
17. Our family has a rule for almost every possible situation.
18. Things do not get done in our family.
19. Family members consult other family members on important decisions.
20. My family is able to adjust to change when necessary.
21. Family members are on their own when there is a problem to be solved.
22. Family members have little need for friends outside the family.
23. Our family is highly organized.
24. It is unclear who is responsible for things (chores, activities) in our family.
25. Family members like to spend some of their free time with each other.
26. We shift household responsibilities from person to person.
27. Our family seldom does things together.
28. We feel too connected to each other.
29. Our family becomes frustrated when there is a change in our plans or routines.
30. There is no leadership in our family.
31. Although family members have individual interests, they still participate in family activities.
32. We have clear rules and roles in our family.
33. Family members seldom depend on each other.
34. We resent family members doing things outside the family.
35. It is important to follow the rules in our family.
36. Our family has a hard time keeping track of who does various household tasks.
37. Our family has a good balance of separateness and closeness.
38. When problems arise, we compromise.
39. Family members mainly operate independently.
40. Family members feel guilty if they want to spend time away from the family.
41. Once a decision is made, it is very difficult to modify that decision.
42. Our family feels hectic and disorganized.
43. Family members are satisfied with how they communicate with each other.
44. Family members are very good listeners.
45. Family members express affection to each other.
46. Family members are able to ask each other for what they want.
47. Family members can calmly discuss problems with each other.
48. Family members discuss their ideas and beliefs with each other.
49. When family members ask questions of each other, they get honest answers.
50. Family members try to understand each other’s feelings
51. When angry, family members seldom say negative things about each other.
52. Family members express their true feelings to each other.

**How satisfied are you with:**
53. The degree of closeness between family members.
54. Your family’s ability to cope with stress.
55. Your family’s ability to be flexible.
56. Your family’s ability to share positive experiences.
57. The quality of communication between family members.
58. Your family’s ability to resolve conflicts.
59. The amount of time you spend together as a family.
60. The way problems are discussed.
61. The fairness of criticism in your family.
62. Family members concern for each other.

*Thank you for Your Cooperation!*
Culture Orientation Scale

The items should be mixed up prior to administering the questionnaire. All items are answered on a 9-point scale, ranging from 1 = never or definitely no and 9 = always or definitely yes.

Horizontal individualism items:
1. I'd rather depend on myself than others.
2. I rely on myself most of the time; I rarely rely on others.
3. I often do "my own thing."
4. My personal identity, independent of others, is very important to me.

Vertical individualism items:
1. It is important that I do my job better than others.
2. Winning is everything.
3. Competition is the law of nature.
4. When another person does better than I do, I get tense and aroused.

Horizontal collectivism items:
1. If a coworker gets a prize, I would feel proud.
2. The well-being of my coworkers is important to me.
3. To me, pleasure is spending time with others.
4. I feel good when I cooperate with others.

Vertical collectivism items:
1. Parents and children must stay together as much as possible.
2. It is my duty to take care of my family, even when I have to sacrifice what I want.
3. Family members should stick together, no matter what sacrifices are required.
4. It is important to me that I respect the decisions made by my groups.
SAFE SEX BEHAVIOR QUESTIONNAIRE (SSBQ) (DiLorio, et al., 1993)

Directions: Below is a list of sexual practices. Please read each statement and respond by indicating your degree of use of these practices.

1 = Never               2 = Sometimes                 3 = Most of the Time                   4 = Always

1. I insist on condom use when I have sexual intercourse.
   1         2         3          4

2. I use cocaine or other drugs prior to or during sexual intercourse.
   1         2         3           4

3. I stop foreplay long enough to put on a condom (or for my partner to put on a condom).
   1         2         3           4

4. I ask potential sexual partners about their sexual histories.
   1         2         3           4

5. I avoid direct contact with my sexual partner’s semen or vaginal secretions.
   1         2         3           4

6. My partner and I use spermicide as well as a condom with each act of sexual intercourse.
   1         2         3          4

7. I have sexual intercourse with someone who injects drugs (IV drugs) into his/her veins.
   1         2         3          4

8. I ask my potential sexual partners about a history of bisexual/homosexual practices.
   1         2         3          4

9. I engage in sexual intercourse on a first date.
   1         2         3          4

10. I abstain from sexual intercourse when I do not know my partner’s sexual history.
    1         2         3          4

11. I avoid sexual intercourse when I have sores or irritation in my genital area.
    1         2         3          4

12. If I know an encounter may lead to sexual intercourse, I carry a condom with me.
    1         2         3          4

13. I insist on examining my sexual partner for sores, cuts, or abrasions in the genital area.
14. If I disagree with information that my partner presents on safer sex practices, I state my point of view.

1 = Never               2 = Sometimes                 3 = Most of the Time                   4 = Always

15. I engage in oral sex without using protective barriers such as a condom or rubber dam.

16. I use rubber gloves for sexual foreplay when I have cuts or abrasions on my hands.

17. If swept away in the passion of the moment, I have sexual intercourse without using a condom.

18. I engage in anal intercourse.

19. I ask my potential sexual partners about a history of IV drug use.

20. If I know an encounter may lead to sexual intercourse, I have a mental plan to practice safer sex.

21. If my partner insists on sexual intercourse without a condom, I refuse to have sexual intercourse.

22. I avoid direct contact with my sexual partner’s blood.

23. It is difficult for me to discuss sexual issues with my sexual partners.

24. I initiate the topic of safer sex with my potential sexual partner.

25. I have sexual intercourse with someone who I know is a bisexual or gay.

26. I engage in anal intercourse without using a condom.
27. I drink alcoholic beverages prior to or during sexual intercourse.
Contemporary Filial Piety Scale

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<tr>
<th>Very unimportant</th>
<th>Unimportant</th>
<th>Neutral</th>
<th>Important</th>
<th>Very Important</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tbody>
</table>

- Arrange care for parents when they can no longer care for themselves
- Provide financial subsistence to parents when they can no longer financially support themselves
- Arrange appropriate treatment for parents when they fall ill
- Attend parents’ funerals no matter where I am
- Visit parents regularly if I am not living with them
- Be thankful to parents’ nurturing
- Try my best to achieve parents’ expectation
- Always be polite when talking to parents
- Try my best to complete parents’ unachieved goals
- Always care about parents’ well being
Youth Risk Behavior Survey

The following questions ask about substance use behavior:

32. During the past 30 days, on how many days did you smoke cigarettes?
   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

33. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
   A. I did not smoke cigarettes during the past 30 days
   B. Less than 1 cigarette per day
   C. 1 cigarette per day
   D. 2 to 5 cigarettes per day
   E. 6 to 10 cigarettes per day
   F. 11 to 20 cigarettes per day
   G. More than 20 cigarettes per day

35. During the past 30 days, on how many days did you use an electronic vapor product?
   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

The next 3 questions ask about other tobacco products.

37. During the past 30 days, on how many days did you use chewing tobacco, snuff, dip, snus, or dissolvable tobacco products, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, Copenhagen, Camel Snus, Marlboro Snus, General Snus, Ariva, Stonewall, or Camel Orbs? (Do not count any electronic vapor products.)
   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days
38. During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

3. During the past 30 days, on how many days did you have at least one drink of alcohol?
A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

4. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
A. 0 days
B. 1 day
C. 2 days
D. 3 to 5 days
E. 6 to 9 days
F. 10 to 19 days
G. 20 or more days

9. During the past 30 days, how many times did you use marijuana?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

The next 10 questions ask about other drugs.

10. During the past year, how many times have you used any form of cocaine, including powder, crack, or freebase?
11. During the past year, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
   A. 0 times  
   B. 1 or 2 times  
   C. 3 to 9 times  
   D. 10 to 19 times  
   E. 20 to 39 times  
   F. 40 or more times 

12. During the past year, how many times have you used heroin (also called smack, junk, or China White)?
   A. 0 times  
   B. 1 or 2 times  
   C. 3 to 9 times  
   D. 10 to 19 times  
   E. 20 to 39 times  
   F. 40 or more times 

13. During the past year, how many times have you used methamphetamine (also called speed, crystal, crank, or ice)?
   A. 0 times  
   B. 1 or 2 times  
   C. 3 to 9 times  
   D. 10 to 19 times  
   E. 20 to 39 times  
   F. 40 or more times 

14. During the past year, how many times have you used ecstasy (also called MDMA or Molly)?
   A. 0 times  
   B. 1 or 2 times  
   C. 3 to 9 times  
   D. 10 to 19 times  
   E. 20 to 39 times  
   F. 40 or more times 

15. During the past year, how many times have you used synthetic marijuana (also called K2, Spice, fake weed, King Kong, Yucatan Fire, Skunk, or Moon Rocks)?
16. During the past year, how many times have you taken **steroid pills or shots** without a doctor's prescription?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

17. During the past year, how many times have you taken a **prescription drug** (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

18. During your life, how many times have you used a needle to inject any **illegal** drug into your body?
   A. 0 times
   B. 1 time
   C. 2 or more times
Strengths and Difficulties Questionnaire
Please give your answers below based on how things have been for you over the last six months. Rate each answer as 0 = Not True 1 = Somewhat True 2 = Certainly True

1. I try to be nice to other people. I care about their feelings
2. I am restless, I find it hard to sit down for long
3. I get a lot of headaches, stomach-aches or sickness
4. I usually share with others, for example food or drink
5. I get very angry and often lose my temper
6. I would rather be alone than with other people
7. I am generally willing to do what other people want
8. I worry a lot
9. I am helpful if someone is hurt, upset or feeling ill
10. I am constantly fidgeting or squirming
11. I have at least one good friend
12. I fight a lot. I can make other people do what I want
13. I am often unhappy, depressed or tearful
14. Other people generally like me
15. I am easily distracted, I find it difficult to concentrate
16. I am nervous in new situations. I easily lose confidence
17. I am kind to children
18. I am often accused of lying or cheating
19. Other people pick on me or bully me
20. I often offer to help others (family members, friends, colleagues)
21. I think before I do things
22. I take things that are not mine from home, work or elsewhere
23. I get along better with older people than with people of my own age
24. I have many fears, I am easily scared
25. I finish the work I’m doing. My attention is good
APPENDIX D

COLLABORATORS
Table D1

*Collaborating Authors*

<table>
<thead>
<tr>
<th>Tier + Description</th>
<th>Contributor (Alphabetical after key personnel in tier 1)</th>
</tr>
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<td><strong>Tier 1:</strong> Central to study conceptualization and design, manuscript drafting, reviewing, and editing.</td>
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<td>7. Andrew Robert Yockey, M.S.</td>
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<td><strong>Tier 2:</strong> Contributed substantially to drafting, reviewing and editing of the manuscript. Assisted with specific sections of the manuscript, (i.e.: edits on introduction, results, and discussion) and/or aided in the creation of figures and tables. Assembled materials and IRB documents for their site.</td>
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<td>Dr. Tara Stoppa</td>
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<td><strong>Tier 3:</strong> Primary investigator and data collector at each site, procedural formation, and minor review and editing of the manuscript. Assembled IRB documents and other materials. Helped with specific sections based on individual expertise, interest areas</td>
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<td>Tier + Description</td>
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</table>
| Tier 4: Acted as primary investigator at their site and managed data collection. E.g.: Granted credit to participants. Managed their participant managing system | - Dr. Parviz Azadfallah  
- Dr. Hojjatollah Farahani  
- Rhiannon Gibbs  
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- Dr. Israel Meth  
- Dr. Kalu Ogba  
- Dr. İrem Metin Orta  
- Dr. Christopher Redker  
- Dr. Casiana Reyes  
- Jean Margarette Santos  
- Dr. Stephanie Wright  
- Dr. Sibo Zhao |
| Tier 5: Other data collectors; Individuals who helped with the initial conception of NICE, and helped facilitate Psi Chi processes, but were not involved in the Crowd project | - Dr. Rhonda Balzarini  
- Dr. Zornitsa Kalibatseva  
- Maija Taneska  
- Elisa Rapadas  |

Table D1 (continued)