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Assessing Implicit Associations with Consensual Non-monogamy Among U.S. Early Emerging Adults: An Application of the Single-Target Implicit Association Test

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Abstract
Research has demonstrated that implicit and explicit attitudes toward consensual nonmonogamy (CNM; sexually and/or emotionally nonexclusive romantic relationships) are less favorable than those toward monogamy. Although this general pattern of results is often reported, it is not clear to what extent this implicit difference reflects negative associations with CNM. To investigate this issue, the current study assessed 355 U.S. early emerging adults' (89 men, 265 women, one gender nonconforming) implicit associations with CNM and monogamy using the Single-Target Implicit Association Test (ST-IAT). In addition, the convergent (using explicit measures), postdictive, and concurrent validity of the CNM ST-IAT was also investigated. The results revealed that although early emerging adults demonstrated a positive implicit association with monogamy (mean *D* score = 0.38), a neutral implicit association emerged for CNM (mean *D* score = 0.00). Additionally, young women and those without previous CNM experience demonstrated more negative implicit associations with CNM as compared to men and those with previous CNM experience. Finally, implicit associations with CNM predicted willingness to allow one's partner to participate in CNM, but not one's own interest in CNM. These results support previous research suggesting that a disparity in attitudes toward CNM and monogamy exists and provides further clarification reflecting positive implicit associations with monogamy and neutral associations with CNM. These results also confirm that monogamous relationships continue to be upheld as the ideal relationship structure in the U.S. and that educators/practitioners should work to reduce negative implicit bias toward CNM in an attempt to promote relationship equity.

Keywords Consensual nonmonogamy · Implicit attitudes · Stigma · Polyamory · Open relationships

Introduction

Broadly defined, consensual nonmonogamy (CNM) is a term that refers to "romantic relationships that are negotiated between two or more people and are therefore nonexclusive, either sexually, emotionally, or in combination" (Grunt-Mejer & Campbell, 2016, p. 45) or romantic relationships in which "all parties agree that it is acceptable to have additional romantic or sexual partners" (Muise, Laughton, Moors, & Impett, 2019, p. 1918). Research reveals that individuals practicing CNM are often perceived negatively and instances of CNM are met with disapproval (e.g., Cohen & Wilson, 2017; Conley, Moors, Matsick, & Ziegler, 2013). In fact, in Conley et al.'s work (2013), a random sample of U.S. adults reported assuming that people in monogamous relationships were happier and more sexually satisfied than were those in CNM relationships. The stigma facing those in CNM relationships even extended to perceptions of the person's overall character, such that individuals in monogamous relationships were perceived to be better citizens (i.e., "law-abiding," "well-educated," "likely to volunteer in communities," "charismatic") than were those in CNM relationships.

Sexual and Relationship Stigma

These negative attitudes surrounding CNM provide evidence of the stigma (defined as the devaluation of an individual for

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possessing a norm-violating attribute; Dovidio, Major, & Crocker, 2000) facing individuals who engage in relationships that violate social norms related to monogamy. In fact, research indicates that individuals in a variety of marginalized groups experience stigma, including sexual minority groups (i.e., sexual stigma—defined as the "negative regard, inferior status, and relative powerlessness that society collectively accords to any non-heterosexual behavior, identity, relationship, or community"; Herek & Garnets, 2007, pp. 906–907).

Although sexual stigma has never been studied with respect to individuals in CNM relationships, it likely can help explain the disapproval and negative treatment these individuals receive. The reason sexual stigma may be useful in this context is because individuals in CNM relationships violate social norms related to monogamy. In fact, the prototype of a sexually and romantically exclusive couple has been heralded as the ideal relationship structure among Western cultures for decades (Balzarini, Shumlich, Kohut, & Campbell, 2018; Herlihy, 1995; MacDonald, 1995; Perel, 2006). Furthermore, this mononormativity bias (defined as the "assumption of the normalcy and naturalness of monogamy, analogous to such assumptions around heterosexuality inherent in the term heteronormativity"; Barker & Langdridge, 2010, p. 750) is so prominent among Western societies that it is enforced in a variety of institutional and legal mechanisms (e.g., marriage, couples counseling; Bergstrand & Sinski, 2010; Emens, 2004). Furthermore, individuals in CNM relationships have been classified as sexual minorities in other programs of research (Herbenick et al., 2017), thereby making sexual stigma (Herek & Garnets, 2007) the ideal conceptual framework to adopt when explaining CNM stigma. Thus, for the purposes of the current study, sexual stigma was re-labeled as sexual and relationship stigma and defined as the negative regard, inferior status, and relative powerlessness that society collectively accords to any non-traditional sexual behavior, identity, relationship, or community.

Previous research that has used the concept of sexual stigma to explain the disapproval and negative treatment of sexual minority individuals has revealed that the prevalence of sexual stigma in Western cultures is decreasing and that same-sex relationships are more accepted than ever before (Morrison & Morrison, 2003; Twenge, Sherman, & Wells, 2016). For example, acceptance of same-sex sexual behavior has increased in recent years, with 49% of U.S. adults reporting that it is "not wrong at all" in 2014, as compared to 13% in 1990 (Twenge et al., 2016). Furthermore, millennials (e.g., those born between 1981 and 1996) were the most accepting, with 63% reporting that same-sex sexuality was "not wrong at all."

This increased acceptance may also extend to individuals in CNM relationships. For example, scholarly and popular interest in CNM has increased in the past decade, which may indicate greater acceptance (Haupert, Gesselman, Moors, Fisher, & Garcia, 2016; Sizemore & Olmstead, 2016). In a study examining Google trends over the past 10 years, search terms related to polyamory and open relationships rose significantly (Moors, 2017). With respect to scholarly interest, a brief literature review revealed that the number of peer-reviewed scholarly publications related to CNM more than doubled from 2010 to 2019 (as compared to 2000–2010). In fact, from 2010 to 2019, over 65 peer-reviewed articles were published that involved CNM to some extent, as compared to approximately 30 from 2000 to 2010.

Recent Trends in Consensual Non-Monogamy Attitudes

These trends toward CNM acceptance are also evident in the literature on attitudes. Despite the traditionally negative evaluations of individuals in CNM relationships (Cohen & Wilson, 2017; Conley et al., 2013), research suggests that these individuals are actually viewed somewhat neutrally. In particular, in one study that examined attitudes toward CNM relationships, participants were asked to rate vignettes of people who engaged in monogamy, polyamory, open relationships, and swinging on qualities such as relationship satisfaction, morality, and cognitive abilities (Grunt-Mejer & Campbell, 2016). Although monogamous relationships were rated more positively than CNM, those in CNM relationships received fairly neutral ratings (with means ranging from 3.47 to 4.58 on a 7-point scale).

The results reported by Grunt-Mejer and Campbell (2016) were replicated by Thompson, Hart, Stefaniak, and Harvey (2018b). In particular, although initiators of polyamory, swinging, open relationships, and group sex were perceived less favorably than were those initiating a monogamous sexual behavior (e.g., role playing), evaluations of initiators of CNM behaviors were neutral to somewhat positive. In fact, using the same scale as Grunt-Mejer and Campbell (2016), the means associated with evaluations of CNM initiators ranged from 4.02 to 5.15.

The Role of Social Desirability Biases in Attitudes Toward Consensual Non-Monogamy

Although some may argue that this trend in attitudes toward CNM is a result of increased acceptance and visibility in recent years, it is possible that they are a by-product of response biases (e.g., social desirability bias). Socially desirable responding is a result of participants' tendency and desire to represent themselves in the best possible way (e.g., reporting a response that distorts one's actual opinion in order to avoid appearing closed-minded or unaccepting; Maccoby & Maccoby, 1954; Paulhus, 1982). This biased responding has been documented across virtually all forms of self-report/explicit measures and nearly all fields in the social sciences (Fisher & Katz, 2000; Holtgraves, 2004; Levy, 1981; Steenkamp, De Jong, & Baumgartner, 2010). In fact, socially desirable responding most frequently occurs when responding to measures assessing socially sensitive topics, such as sexuality (King & Brunner 2000; Thompson & O'Sullivan, 2012).

Socially desirable responding is particularly problematic because it affects the validity of items, measures, and studies (Huang, Liao, & Chang, 1998). Researchers posit that between 10 and 75% of the variance in participants' responses on self-report measures can be explained by tendencies to respond in socially desirable ways, which obscures, confounds, and/or produces artificial relationships among constructs being studied (King & Brunner, 2000; Nederhof, 1985). Thus, to bypass issues associated with socially desirable responding and to protect the validity of a study, many scholars in the field of social cognition suggest using implicit measures (Dunham, Baron, & Banaji, 2006; Greenwald & Banaji, 1995; Greenwald, Nosek, & Banaji, 2003; Hermans, Vansteenwegen, Crombez, Baeyens, & Eelen, 2002; Nier, 2005; Ziegert & Hanges, 2005). In particular, implicit measures are those that do not require introspective access to the constructs being assessed (Gawronski, LeBel, & Peters, 2007). Consequently, implicit measures rely on automatic/involuntary responses to stimuli that occur outside of conscious awareness, often assessed using experimental paradigms (Greenwald & Banaji, 1995). The most widely used, effective, and prominent example of an implicit measure is Greenwald, McGhee, and Schwartz's (1998) Implicit Association Test (IAT).

The IAT is a computer-based test designed to measure the strength of associations between a target-concept dimension (CNM/monogamy) and an attribute dimension (positive/negative) by assessing reaction time. The basic notion behind the IAT is that the speed at which participants sort a certain target concept (e.g., monogamy) with an attribute concept (e.g., positive) is dependent on the strength of corresponding cognitive associations between these concepts. Thus, sorting monogamy stimuli with positive stimuli more quickly than sorting CNM stimuli with positive stimuli is interpreted as an automatic preference for monogamy as compared to CNM.

Implicit Associations Related to Consensual Non-Monogamy

Only two studies to date have attempted to assess attitudes toward CNM using implicit measures (Kenyon, Wolfs, Osbak, van Lankveld, & Van Hal, 2018; Thompson, Bagley, & Moore, 2018a). In the first study, Thompson et al. (2018a) assessed 204 U.S. college students' attitudes toward CNM and monogamy both explicitly (using surveys) and implicitly (using the IAT). Their results revealed that, despite reporting neutral explicit attitudes toward CNM, participants demonstrated a strong implicit preference for monogamy as compared to CNM. In addition, although there was a significant positive relationship between explicit and implicit attitudes, the tendency to respond in socially desirable ways (as measured by the Marlowe–Crown Social Desirability Scale) moderated this relationship. In particular, the implicit and explicit attitudes of the college students in the study were more closely related among those less likely to respond in a socially desirable manner as compared to those who were more susceptible to this bias.

In the second study, Kenyon et al. (2018) adopted a similar approach, but used the terms of "monogamy" and "multiple partners" to represent their target categories. The results from 869 Belgian students replicated the results from Thompson et al.'s study (2018a) revealing that young adults demonstrated a strong implicit preference for monogamy as compared to multiple partners. Implicit and explicit measures were also slightly positively correlated with one another. In addition, basic demographic analyses revealed no differences in the IAT scores between heterosexual men and women. However, differences emerged when accounting for sexual identity, with students identifying as a sexual minority demonstrating a weaker preference for monogamy than did students identifying as heterosexual. Finally, the researchers found evidence that implicit preferences weakly correlated with behavior, such that students demonstrating a weaker implicit preference for monogamy were more likely to have experience with CNM as compared to those with stronger implicit preferences for monogamy.

Although these innovative studies paved the way for more indirect research investigating attitudes toward CNM, some limitations should be noted. First, because these studies used the traditional IAT, self-selected binary concepts were being compared. This may be problematic because in both studies the authors chose the term "monogamy" to be the counter-terms of "CNM" and "multiple partners," which may not be entirely accurate as these concepts are not complementary pairs (as are typically used with the IAT). Relatedly, what is perhaps more concerning is that the traditional IAT is a comparative test. Thus, it is not clear to what extent the IAT score reflects each of the following possible associations: positive associations with CNM and monogamy (monogamy to a greater extent than CNM), negative associations with CNM and monogamy (CNM to a greater extent than monogamy), or positive associations with monogamy and negative associations with CNM. Although both studies documented differential attitudes between monogamy and CNM, the reliance on this comparative test was unfortunate because it was impossible to determine what the nature and valence of the attitudes toward each concept were. Consequently, the current study addressed this limitation by adopting an adapted version of the traditional IAT, the Single-Target IAT (ST-IAT). The ST-IAT was selected as the ideal measure because it only requires the assessment of associations between one target concept (e.g., CNM) and two attribute concepts (e.g., positive/negative), thereby producing non-comparative scores that reflect the extent to which implicit associations with CNM are positive, neutral, or negative, independent of its relationship to monogamy.

Second, although some forms of convergent and predictive validity were assessed in both studies (Kenyon et al., 2018; Thompson et al., 2018a), certain forms of concurrent validity and demographic characteristics were left unexplored. Thus, the current study was designed to replicate the results of Kenyon

et al. (2018) by assessing differences in implicit associations with CNM according to demographic variables (e.g., gender, sexual orientation, and previous experience with CNM). In addition, the current study advanced the literature by investigating the concurrent utility of the ST-IAT by examining the extent to which implicit associations with CNM predicted interest in CNM and willingness to allow one's partner to participate in CNM.

Demographic Differences Associated with Implicit Consensual Non-Monogamy Associations

Gender

Although Kenyon et al. (2018) failed to document gender differences associated with implicit attitudes toward CNM, the results of numerous related studies support the notion that men hold more permissive attitudes toward a variety of sexual behaviors in comparison with women (Petersen & Hyde, 2011). For instance, men report more accepting explicit attitudes toward casual sex (Peterson & Hyde, 2011) and threesomes (i.e., a specific type of CNM relationship; Thompson & Byers, 2017), and more positive implicit attitudes toward sexuality broadly than do women (Geer & Robertson, 2005; Thompson & O'Sullivan, 2012). Thus, this gender difference is likely true for implicit associations with CNM.

Sexual Orientation

Consistent with the results obtained by Kenyon et al. (2018), sexual minority individuals commonly hold more liberal explicit attitudes toward CNM than do heterosexuals (Cohen & Wilson, 2017; Mark, Rosenkrantz, & Kerner, 2014; Sizemore & Olmstead, 2018). In fact, in a study conducted by Sizemore and Olmstead (2018), adults identifying as a sexual minority were more open-minded when considering CNM participation as compared to heterosexual participants. Furthermore, in a study designed to develop and validate a scale assessing self-reported attitudes toward CNM (Cohen & Wilson, 2017), individuals identifying as heterosexual had significantly less favorable attitudes than did those identifying as a sexual minority. These studies (Cohen & Wilson, 2017; Kenyon et al., 2018; Mark et al., 2014; Sizemore & Olmstead, 2018) provide strong evidence that differences in implicit associations with CNM according to sexual orientation likely also exist.

Previous Experience with Consensual Non-Monogamy

Consistent with Kenyon et al.'s (2018) work, previous experience with certain sexual behaviors has also been documented in relation to attitudes (Shaughnessy, Byers, & Walsh, 2011; Thompson & Byers, 2017; Yost & Zurbriggen, 2006). For example, in a study examining explicit attitudes toward and experience with mixed-gender threesomes, individuals with more positive attitudes toward mixed-gender threesomes were significantly more likely to have prior experience with a mixed-gender threesome as compared to those with less experience (Thompson & Byers, 2017). Additionally, cognitive dissonance theory (Festinger, 1957) would suggest that individuals who have engaged in CNM hold more positive attitudes toward CNM as a mechanism to align their beliefs with their behavior. This alignment would mitigate the psychological tension they might experience resulting from behaviors that oppose their attitudes/beliefs. For example, to avoid feeling negative emotions (e.g., shame) over their engagement in CNM, an individual may instead adjust their beliefs or attitudes (hold a more positive attitude toward CNM) in order to reduce the aversive emotional state they experienced (shame). Thus, it is likely that previous experience with CNM also impacts implicit associations with CNM.

The Concurrent Validity of Implicit Consensual Non-Monogamy Associations

Interest and Willingness to Allow a Partner to Participate in Consensual Non-Monogamy

Although no research has examined willingness to allow a partner to engage in CNM, a few studies have examined personal willingness and interest in engaging in CNM and related behaviors (Moors, Conley, Edelstein, & Chopik, 2015; Moors, Rubin, Matsick, Ziegler, & Conley, 2014; Sizemore, & Olmstead, 2017a, b; 2018; Thompson & Byers, 2017). For example, Thompson and Byers (2017) assessed attitudes and interest related to mixed-gender threesomes and found that young adults with more accepting attitudes also reported greater interest in participating in threesomes ($r = 0.69$). Therefore, implicit associations with CNM likely predict the extent to which an adult reports interest in CNM as well as their willingness to allow a partner to participate in CNM.

Current Study

In sum, the current study adopted the ST-IAT to individually examine implicit associations toward CNM in early emerging adults (ages 18–21 years). As a comparison, implicit associations with monogamy were also assessed using the ST-IAT. Further, the psychometric properties (i.e., convergent, postdictive, and concurrent validity) of the ST-IAT assessing CNM associations were also explored. In particular, convergent validity between implicit and explicit associations was assessed, differences in implicit associations with CNM

related to gender, sexual orientation, and previous CNM experience were examined, and the ability for CNM associations to predict interest in CNM and one's willingness to allow a partner to engage in CNM was investigated.

Early emerging adults (18–21 years of age) were selected as the sampling frame in the current study for four primary reasons. First, we wanted to contrast our findings with those reported in previous research assessing implicit attitudes toward CNM using late adolescents and young adults (Kenyon et al., 2018; Thompson et al., 2018a). Second, because the ST-IAT was administered in a laboratory setting, an undergraduate sample was the most time- and cost-efficient. Third, early emerging adulthood is a time when many individuals begin to live on their own, providing novel opportunities to form romantic relationships (potentially CNM relationships) (Arnett, 2004, 2007; Scoats, 2017). Finally, because younger generations (such as early emerging adults) are reporting more permissive explicit attitudes toward various sexual and relationship orientations (Twenge et al., 2016), the results of this study have important implications for practitioners, educators, and policymakers due to the ability to document the growing acceptance of CNM.

Based on sexual and relationship stigma as well as previous research, the following hypotheses were formulated.

H1 Early emerging adults will demonstrate negative implicit associations with CNM stimuli and positive implicit associations with monogamy stimuli.

H2 Young men, individuals identifying as a sexual minority, and those with CNM experience will demonstrate more positive implicit associations with CNM than will young women, individuals identifying as heterosexual, and those without CNM experience.

H3 Implicit associations with CNM and monogamy will be positively associated with explicit CNM and monogamy associations.

H4 Implicit associations with CNM will be related to interest in engaging in CNM and willingness to allow a partner to explore CNM above and beyond explicit associations.

Method

Participants

A total of 374 undergraduate students (between the ages of 18 and 21) were recruited from two mid-sized Midwestern universities in the U.S. to participate in the current study. However, seven participants were removed because of computer and/or Internet connection complications and five due to reporting an age over 21. Thus, the final sample was comprised of 362 U.S. early emerging adults (92 men, 269 women, and one identifying as gender nonconforming) with a mean age of 18.51 years (SD = 0.75). OA total of 165 participants were recruited from one university and 197 from the other. The majority of participants identified as Caucasian (85.4%) and heterosexual (92.4%). As for their current relationship status, 45.6% identified as being single, 46.2% as being in a dyadic romantic relationship, 6.5% as dating, 0.6% as married, and 0.3% as being in a CNM relationship. Finally, 7.7% of the sample indicated having some type of previous CNM experience. Among those with experience (N = 28), the average number of CNM relationships they had experienced was 1.88 (SD = 0.95, range = 1–5).

Procedure

Undergraduate students were recruited using an online participant pool in which introductory psychology students signed up for studies and obtained course credit as compensation for participation. After obtaining consent, participants were informed that they would be taking two different computer-based tests that assessed the topics of monogamy and CNM. To ensure that participants understood the meaning of these terms, definition sheets were provided to all participants. These definitions described monogamy as "romantic relationships between two and only two people that are sexually and emotionally exclusive" and CNM as "romantic relationships that are negotiated between two or more people and are therefore nonexclusive, either sexually, emotionally, or in combination." After reading the definitions, one of 14 research assistants (eight from one university and six from another) instructed participants to complete two ST-IATs (given in random order), one of which assessed implicit associations with CNM and the other monogamy. The research assistants then instructed participants to complete a battery of electronic questionnaires (via Qualtrics® survey software). Following the completion of the surveys, participants were debriefed on the purpose of the study and compensated with course credit. The entire study took approximately 30–45 min to complete.

Measures

Single-Target Implicit Association Test

Implicit associations with CNM and monogamy were measured using two different ST-IATs via a desktop computer at two different sites. One site ran the ST-IATs using Inquisit 4® (a psychological testing platform created by Millisecond Software®) with an 18" LCD monitor. The other site used Eprime 2.0 (Psychology Software Tools, Pittsburgh, PA) with an 18" CRT monitor. Categorizations of stimuli, which were to be made as quickly as possible without sacrificing accuracy, were made at the former site using the "D" and "K" keys on a keyboard, whereas the latter site used a

serial response box (Psychology Software Tools, Pittsburgh, PA). In both cases, the left and right most keys or buttons (the "D" and "K" keys on the keyboard and the left and right most buttons on the serial response box) corresponded to categorizations made to the attribute category and the target category. All stimuli (i.e., to-be-categorized words) were displayed on the center of the screen until the participant correctly assigned it to its appropriate category. Any incorrectly sorted stimulus was identified with a red "x" that appeared on the screen until it was sorted correctly.

Both the CNM and monogamy ST-IATs consisted of three blocks, each separated by a brief resting period. The first block required participants to practice categorizing the stimuli associated with the attribute category. These stimuli were comprised of five *positively* (e.g., "good," "happy," etc.) and five *negatively* (e.g., "bad," "wrong," etc.) valanced attribute words, each of which was randomly presented two times, to their respective "positive" and "negative" labels that were displayed in the upper right- and left-hand corners of the computer monitor (see Appendix A for all ST-IAT stimuli). The second block required that participants categorized not only the positively and negatively valanced words, but also five different target words representing either "consensual nonmonogamy" (e.g., "open relationship," "group marriage") or "monogamy" (e.g., "exclusive relationship," "traditional marriage") depending on the particular ST-IAT. To do so, the target label (either "consensual nonmonogamy" or "monogamy") was randomly paired with either the "positive" or "negative" attribute label on one of the two sides of the computer monitor. This meant that target words would be classified with the same key that was used for one of the two attributes ("positive" or "negative"). For example, block two may have required a participant to pair CNM and negative stimuli using the left key ("D" key) and positive stimuli using the right key ("K" key). The third block was the same as the second, except the target label was now paired with the opposite attribute label (i.e., if the target label was paired with the attribute label "negative" in block two, the target label would then be paired with "positive" in the third block). Both block two and three consisted of 60 trials in which each word (attribute and target word) was randomly presented four times. Data from blocks two and three were then used to calculate a difference score (*D* score) for each ST-IAT that was used for data analysis.

Piloting of Implicit Association Test Stimuli

Piloting for the stimuli used in the ST-IATs was conducted via two sessions. In the first session, eight undergraduate research assistants who were part of the first author's research team were instructed to generate terms that would serve as stimuli representing the CNM and the monogamy target categories. Through extensive discussion, ten lexical CNM stimuli and ten lexical monogamy stimuli were generated. During the second session of piloting, these ten stimuli were programmed into two ST-IATs. The same eight research assistants were instructed to administer the ST-IATs to two participants each (recruited via word of mouth). Using data from these 16 pilot participants (12 women, four men), the target stimuli that were sorted most efficiently (those sorted to the appropriate categories quickest) were selected for inclusion in the ST-IATs used in the current study. This method of stimuli selection was used in attempt to obtain the stimuli that best portrayed the CNM and monogamy categories. For example, if a participant categorized the term "partner swapping" as belonging to the CNM category more quickly than the other nine stimuli, then we inferred that this stimulus best represented CNM. It is worth noting that the same five attribute stimuli comprising the positive and negative attribute categories that were used in Thompson et al.'s (2018a) study were selected for use in the current study (see Appendix A for the final stimuli).

Psychometric Properties of the Single Target-Implicit Association Test

The traditional IAT has been recognized for possessing desirable psychometric properties such as adequate-to-high levels of reliability (Nosek, Greenwald, & Banaji, 2005) and predictive validity (Dovidio, Kawakami, & Gaertner, 2002; Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Further, a meta-analysis has demonstrated that the traditional IAT possesses superior predictive validity as compared to explicit measures with respect to behavior and attitudes pertaining to socially sensitive issues (e.g., attitudes related to race; Greenwald et al., 2009). With respect to the ST-IAT, Bluemke and Friese (2008) demonstrated that this test possessed acceptable levels of convergent (with the traditional IAT as well as explicit measures) and discriminant validity. Additionally, their study found reliabilities at the lower end of what is typically found for the traditional IAT. However, the authors suggested that this may have been due to the relatively small number of trials that were used in each block of the ST-IAT in their study, and that greater reliability would be expected by increasing the number of trials per block. It should be noted that this particular study used 35 trials per block, whereas the current study used 60.

Computation of Single Target-Implicit Association Test Scores

Two *D* scores were calculated for each participant: one for the CNM ST-IAT and one for the monogamy ST-IAT. Like the traditional IAT, the ST-IAT produces a *D* score that is calculated using a standardized set of procedures. This score serves to gauge the associative strength between the target category ("consensual nonmonogamy" or "monogamy") and the attribute category ("positive" and "negative"). *D* scores were calculated by first removing any categorizations that exceeded 10,000 ms and then taking the difference in categorization reaction times

between the two critical blocks (blocks 2 and 3) and dividing by the total standard deviation (Greenwald et al., 2003).

The resulting *D* scores ranged from −2.00 to +2.00, the value of which reflected the strength and nature of the association between constructs. In the current study, *D* scores closer to −2.00 indicated a negative association with the target category, whereas scores closer to +2.00 indicated a positive association. A score of 0 indicated no association between the constructs represented by the attribute and target categories.

Explicit Associations with Monogamy and Consensual Non-Monogamy

Because previous research investigating attitudes toward CNM (Kenyon et al., 2018; Thompson et al., 2018a) used incomparable implicit and explicit measures (i.e., implicit measures assessing the cognitive attitudinal component and explicit measures assessing the behavior component), novel explicit attitude measures were developed for the current study. Thus, in an effort to create implicit and explicit measures that both assessed the cognitive attitudinal component, the stimuli that were selected for the implicit measure were also adopted to assess explicit associations with CNM and monogamy. In particular, semantic differential items were developed using the same attribute stimuli that were presented in the ST-IATs. For example, using five different items for each of the CNM and monogamy stimuli (all assessed using a 7-point scale), participants were asked to report to what extent they believed each stimulus (e.g., "group sex") was bad–good, unpleasant–pleasant, boring–interesting, immoral–moral, and unsatisfying–satisfying. Scale scores were computed by taking the average score from all five semantic differentials for all CNM and monogamy behaviors. Thus, monogamy and CNM explicit association scores were computed separately, with higher values indicating more positive associations. Both scales demonstrated excellent internal consistency (CNM $\alpha = 0.99$, monogamy $\alpha = 0.95$).

For the purposes of the current study, several items were developed to assess willingness to allow a partner to participate in CNM, interest in engaging in CNM, and previous experience with CNM. Four items assessed "the extent to which the participant would be willing to let their partner be involved in consensual nonmonogamy," in which participants were asked to rate polyamory, open relationships, swinging, and group sex separately using a 5-point scale ranging from 1 (not at all willing) to 5 (very willing). Scale scores were computed by taking the mean of the four items, with higher scores indicting greater willingness to allow a partner to participate in CNM. The four items assessing willingness resulted in a Cronbach's α of 0.81.

To assess interest, four items were created that asked participants "to what extent they were interested in being involved in consensual nonmonogamy." Again, the items assessed polyamory, open relationships, swinging, and group sex using a 5-point scale ranging from 1 (not at all interested) to 5 (very interested). A mean score was computed with greater scores indicating greater interest. The four items assessing interest resulted in a Cronbach's α of 0.76.

Finally, to assess previous experience with CNM, one dichotomous item was included that asked participants whether they had ever "been in a consensually nonmonogamous relationship (i.e., intimate romantic relationships that are negotiated between more than two people and are therefore nonexclusive, either sexually, emotionally, or in combination?)." All respondents were instructed to click either "yes" or "no" to this item. Participants who indicated "yes" were asked to report the number of consensually nonmonogamous relationships they had ever engaged in.

Demographic Questionnaire

Participants completed a demographic questionnaire assessing their age, gender identity, education, ethnicity, sexual orientation, sexual attraction, relationship status, and sexual history. All measures and items can be found on our OSF Web site: https://osf.io/vmtgq/.

Procedure

All measures and procedures were approved for the ethical treatment of human participants by both institutions of record. After IRB approval and pilot work were complete, the undergraduate participants were recruited to participate in a study on the "perceptions of intimate relationships" via SONA Systems, an online platform for participant recruitment and data collection within higher education institutions. Participants were then instructed to attend an hour-long study session taking place in one of two laboratory spaces at the two different campuses. Upon arrival, one of fourteen research assistants presented participants with a paper-based consent form, explained what was to be expected when taking the ST-IATs, and provided a definition sheet for participants defining the target categories in the study. The ST-IATs were counterbalanced across participants using a random number generator. After completing both IATs, participants took a battery of electronic questionnaires (hosted on Qualtrics® survey software), debriefed about the purpose of the study, and compensated with course credit. Reliability check analyses revealed that there were no significant differences for the scores on the ST-IAT and explicit measures across the fourteen research assistants and the two universities.

Results

Prior to conducting the analyses, missing data were examined at the case and item level from our final sample by using procedures outlined by Tabachnick and Fidell (2013). There were no participants missing more than 1.0% of their data.[1]

Therefore, for all variables used in the current study, missing data were dealt with by employing listwise deletion. After converting scale scores to standardized scores, two outliers were identified for the explicit associations with monogamy subscale, one for the explicit associations with CNM subscale, two for willingness to allow a partner to participate in CNM subscale, one for the interest in CNM subscale, and one on the CNM ST-IAT (standardized scores above the ± 3.00 threshold). As a result, these participants were removed from the data set, resulting in a final sample size of 355 U.S. early emerging adults (89 men, 265 women, and one identifying as gender nonconforming). After removing the outliers, tests of skewness were conducted. The results from these tests indicated that scores on the monogamy and CNM explicit association scales, the willingness subscale, and the interest subscale were significantly skewed (obtained by dividing the skewness by the skew standard error). However, no transformations could adequately correct for skew. Thus, raw values were used in all primary analyses.

Implicit Associations with Monogamy and Consensual Non-Monogamy

To examine H1, descriptive statistics and one sample *t*-tests were computed using *D* scores produced from the monogamy and the CNM ST-IATs. Consistent with our expectations regarding implicit associations related to monogamy, the mean *D* score for the monogamy ST-IAT indicated that early emerging adults demonstrated positive implicit associations with monogamy stimuli ($M = 0.38$, SD = 0.33). According to generally accepted break points of *D* scores (slight positive/negative association: ± 0.15, moderate positive/negative association: ± 0.35, and strong positive/negative association: ± 0.65; Greenwald et al., 2003, 2009), the majority of participants demonstrated a moderately positive preference for monogamy (see Table 1 for the proportion of participants classified into each category of *D* scores). The results from the one sample *t*-test revealed that the average monogamy ST-IAT *D* score was significantly different from zero (equivalent of no implicit preference), $t(354) = 21.99$, $p < .001$, $d = 1.15$. These results indicate that early emerging adults demonstrated a significant positive association with monogamy.

Table 1 Descriptive information for the magnitude of the monogamy and CNM ST-IAT D scores

	CNM *D* scores *N* (%)	Monogamy *D* scores *N* (%)
Strong negative association	6 (1.7%)	0 (0.0%)
Moderate negative association	54 (15.3%)	7 (2.0%)
Slight negative associations	61 (17.2%)	21 (5.9%)
Neutral association	118 (33.3%)	55 (15.5%)
Slight positive association	68 (19.2%)	72 (20.3%)
Moderate positive association	37 (10.5%)	111 (31.4%)
Strong positive association	10 (2.8%)	88 (24.9%)

$N = 355$. Number and percentage reflect the number of participants classified into each *D* score category

Contrary to our predictions related to implicit associations with CNM, the mean *D* score for the CNM ST-IAT indicated that young men and women demonstrated a neutral implicit association with CNM stimuli ($M = 0.00$, SD = 0.32). Using the same cut-points, the majority of participants fell into the category in which they had neither positive nor negative associations with CNM (see Table 1 for the proportion of participants classified into each category of *D* scores). The results from the one sample *t*-test revealed that the average CNM ST-IAT *D* score was not significantly different from zero (equivalent of no implicit preference), $t(354) = -0.06$, $p = .95$, $d = 0.00$. These results indicate that early emerging adults' implicit associations with CNM did not differ significantly from neutral.

Differences in Implicit Associations with Consensual Non-Monogamy

Several independent samples *t*-tests were conducted to examine H2. As expected, the *t*-test assessing gender differences (after removing the gender-diverse participant) revealed that young women demonstrated significantly more negative associations with CNM ($M = -0.03$, SD = 0.32) than did young men ($M = 0.07$, SD = 0.32), $t(352) = 2.48$, $p = .01$, $d = 0.31$. The *t*-test examining sexual orientation differences did not confirm the hypothesis. In particular, participants identifying as a sexual minority demonstrated no difference in their CNM ST-IAT *D* scores ($M = 0.10$, SD = 0.31) as compared to heterosexuals ($M = -0.01$, SD = 0.32), $t(349) = 1.63$, $p = .10$, $d = 0.35$. Finally, as expected, the *t*-test comparing differences related to CNM experience indicated that early emerging adults with CNM experience demonstrated significantly more positive associations with CNM ($M = 0.14$, SD = 0.29) than did those without CNM experience ($M = -0.01$, SD = 0.33), $t(353) = 2.42$, $p = .02$, $d = 0.48$.

[1] Although two measures of social desirability were included, both demonstrated poor scale reliability (with alphas less than 0.50). Thus, these scales were not included in the current study.

Table 2 Means, SDs, and correlations for study variables

	Bivariate correlations						
	Study variables	1	2	3	4	5	6
1	CNM *D* score		0.05	0.18**	−0.09	0.10	0.12*
2	Monogamy *D* score			0.03	0.09	−0.01	−0.03
3	Explicit CNM score				−0.24***	0.50***	0.48***
4	Explicit monogamy score					−0.26***	−0.24***
5	Interest						0.68***
6	Willingness						
Mean		0.00	0.38	2.71	6.24	1.33	1.22
SD		0.32	0.33	1.37	0.75	0.58	0.52

$N = 355$

Interest, interest in CNM (rated on a 5-point scale); willingness, willingness to allow a partner to participate in CNM (rated on a 5-point scale)

***$p < .001$; **$p < .01$; *$p < .05$

Relationship Between Implicit and Explicit Associations with Monogamy and Consensual Non-Monogamy

Pearson product-moment correlations examining the relationship between implicit and explicit associations with monogamy and CNM (H3) indicated that there was no relationship between implicit and explicit associations with monogamy, $r(N = 355) = 0.09$, $p = .11$. However, as expected, there was a small but significant relationship between implicit and explicit associations with CNM, $r(N = 355) = 0.18$, $p = .001$.

Relationship Between Interest, Willingness, and Implicit Associations with Consensual Non-Monogamy

To examine H4, two separate hierarchical regressions were conducted: one predicting interest in CNM and the other predicting willingness to allow a partner to participate in CNM. In both regressions, explicit associations with CNM were entered on the first step and implicit associations with CNM were entered on the second. For bivariate correlations and the descriptive information for each variable, see Table 2.

With respect to the regression predicting interest in CNM, on block one, explicit associations with CNM accounted for a significant amount of the variance in CNM interest, $R^2 = 0.25$, $F(1, 352) = 118.13$, $p < .001$. However, contrary to expectations, the inclusion of implicit associations with CNM at block two did not account for a significant amount of additional variance in CNM interest, R^2 change $= 0.00$, $F(1, 352) = 0.10$, $p = .76$. An examination of the unique relationships at block two indicated that explicit associations with CNM accounted for a greater proportion of variance in CNM interest ($sr^2 = 0.24$, $\beta = 0.50$, $p < .001$) than did implicit CNM associations ($sr^2 = 0.00$, $\beta = 0.02$, $p = .76$).

As for the regression predicting willingness to allow a partner to participate in CNM, on block one, explicit associations with CNM accounted for a significant amount of the variance in one's willingness to allow a partner to participate in CNM, $R^2 = 0.21$, $F(1, 352) = 95.01$, $p < .001$. Consistent with expectations, the inclusion of implicit associations with CNM at block two accounted for a significant amount of additional variance in CNM interest, R^2 change $= 0.02$, $F(1, 352) = 8.18$, $p = .004$. An examination of the unique relationships at block two indicated that, although explicit associations with CNM accounted for a greater proportion of variance in one's willingness to allow a partner to participate in CNM ($sr^2 = 0.18$, $\beta = 0.44$, $p < .001$), implicit CNM associations still uniquely accounted for a significant amount of variance ($sr^2 = 0.02$, $\beta = 0.14$, $p = .004$).

Discussion

Because much of the research on attitudes and stigma facing individuals in CNM relationships has relied on self-report/explicit measures (e.g., Cohen & Wilson, 2017; Conley et al., 2013; Grunt-Mejer & Campbell, 2016; Thompson et al., 2018a), responses biases such as socially desirable responding are concerns that likely negatively impact the internal and external validity of these studies. Thus, the primary objective of the current study was to add to our understanding of attitudes toward CNM by employing implicit measures to assess associations with CNM. In addition, to address limitations associated with previous research adopting the traditional IAT to measure CNM attitudes (Kenyon et al., 2018; Thompson et al., 2018a), the current study used the ST-IAT to determine the valence of associations with CNM, the extent to which these implicit associations differ across individuals, and the extent to which

these associations were associated with one's interests and experiences.

Implicit Associations with Consensual Non-Monogamy and the Utility of the Single Target-Implicit Association Test Scores

Contrary to what would be expected according to sexual stigma, the results of the current study revealed that early emerging adults' implicit associations with CNM were generally neutral and their associations with monogamy were positive. These results replicate the results from previous research employing self-report/explicit measures to assess attitudes toward CNM (Grunt-Mejer & Campbell, 2016; Thompson et al., 2018a), which have reported neutral attitudes related to CNM. Furthermore, our findings help to explain the implicit attitudes documented by Thompson et al. (2018a) and Kenyon et al. (2018). In particular, the strong preference for monogamy as compared to CNM is likely not a result of negative associations with CNM, but strong positive associations with monogamy.

One potential explanation as to why implicit associations with CNM were generally neutral may relate to the extent to which certain forms of CNM violate social norms and sexual/relationship scripts. For example, although we have been socialized to view monogamy as the ideal relationship structure (Balzarini et al., 2018; Herlihy, 1995; MacDonald, 1995; Perel, 2006), perhaps certain forms of exclusivity are valued more than others. In fact, research indicates that relationships violating emotional exclusivity may be stigmatized more than those violating sexual exclusivity (Thompson et al., 2018a, b). Thus, because three of the five CNM stimuli used in the current study described relationship structures in which sexual exclusivity was violated and emotional exclusivity was preserved (orgy, group sex, partner swapping), implicit associations may have been more neutral than what would result if using stimuli portraying relationship structures in which both forms of exclusivity were violated (e.g., polyamory).

The ability to obtain a more nuanced understanding of implicit attitudes toward CNM and determine the valence of associations with CNM is a direct result of the use of the ST-IAT. In particular, because the traditional IAT only allows for the evaluation of differential implicit associations between categories (i.e., targets), the resulting *D* score does not indicate what the nature of the implicit associations is for each concept individually (i.e., although a *D* score may indicate that a preference for monogamy over CNM exists, this score does not reveal whether there is a positive or negative association for each concept individually). However, as discussed in the Introduction, the ST-IAT allows for the assessment of implicit associations between two attribute concepts and a single target concept. Through the use of two ST-IATs, one for CNM and the other for monogamy, the current study was able to clarify the nature of the difference in implicit associations between monogamy and CNM that has been documented in previous work.

Although associations with CNM were neutral (i.e., neither positive or negative), it is important to stress that there was a strong positive implicit association with monogamy. Consequently, the current results support the notion that exclusive, monogamous relationships are still upheld as the ideal relationship structure among Western cultures (Balzarini et al., 2018 Conley et al., 2013; Herlihy, 1995; MacDonald, 1995; Perel, 2006). In fact, examination of the distribution of *D* scores reveals that nearly 35% of participants demonstrated negative associations with CNM, whereas only 8% demonstrated negative associations with monogamy. Thus, because of the substantial proportion of early emerging adults associating negatively with CNM, it is likely that stigma facing individuals in CNM relationships is still a concern and pervasive in the U.S.

Differences in Implicit Consensual Non-Monogamy Associations

Gender

As predicted, young men demonstrated significantly more positive implicit associations with CNM than did young women, suggesting that men held more positive implicit attitudes toward CNM relationships and behaviors than did women. This is not surprising, as research broadly has shown men report more positive explicit (casual sex; Petersen & Hyde, 2010; threesomes; Thompson & Byers, 2017) and implicit attitudes toward sexuality (sexuality broadly; Geer & Robertson, 2005; Thompson & O'Sullivan, 2012). Then, why did the current study find a gender difference with respect to implicit associations with CNM, whereas previous research did not (Thompson et al., 2018a; Kenyon et al., 2018)? One explanation is that through using the traditional IAT, previous studies were unable to capture the nuanced nature of gender differences associated with CNM associations as both genders may have had similar absolute differences in terms of their implicit associations with CNM/nonmonogamy and monogamy. So, whereas men and women may not be socialized to have contrasting implicit preferences in regard to monogamous/CNM relationships, the degree to which they implicitly prefer CNM is different. Through the use of two ST-IATs, the current study was able to capture this nuanced difference.

Taken together, this interpretation provides evidence for both the gender similarities hypothesis (Hyde, 2014) and gender-divergent sexual script theory (Gagnon & Simon, 1973; Weiderman, 2005). The lack of a gender difference in previous IAT studies (Kenyon et al., 2018; Thompson et al., 2018a) supports the notion that men and women are more similar in regard to their sexual preferences, scripts, and attitudes than they are different (gender similarities hypothesis; Hyde, 2014), as our results demonstrated that men and women both implicitly

preferred monogamy in comparison with CNM. However, when teasing apart the degree to which men and women implicitly viewed CNM as negative/positive, there was a difference, with men demonstrating more positive associations than did women. These nuanced results provide support for gender-divergent sexual script theory (Gagnon & Simon, 1973), in which men and women's social experiences dictate their adoption of differing social "scripts" toward sexuality and relationships (Wiederman, 2005). Social scripts reflect cultural norms and provide individuals with a valuable mechanism to predict others' behaviors and inform our own behavioral decision-making and attitudes (Dworkin & O'Sullivan, 2005; Gagnon & Simon, 1973; Oliver & Hyde, 1993). These scripts, in which men are socialized to be more sexually pursuant and women more sexually disinterested (Simms & Byers, 2013; Wiederman, 2005), likely still dictate these smaller, more intricate differences we observed in the present study.

Sexual Orientation

The results from our study indicated that there were no differences in implicit CNM associations related to sexual orientation. Although this seems to be in stark contrast to Kenyon et al.'s (2018) study, it may be a by-product of differences in the stimuli selected for the current study. In particular, in Kenyon et al.'s (2018) study, the visual stimuli representing "multiple partners" often depicted (whether purposeful or not) nonconsensual nonmonogamy (e.g., an image of a sexual partner fantasizing about sexual relationships with another person, an image of a sexual partner holding hands with a secondary partner behind their primary partner's back). Therefore, the results of previous research may have actually captured implicit attitudes toward nonconsensual nonmonogamy (or infidelity) rather than CNM. In fact, research assessing explicit attitudes and reactions to infidelity confirms our suspicions, in that adults identifying as a sexual minority report less negative attitudes and less jealousy in response to sexual and emotional infidelity as compared to heterosexual adults (Frederick & Fales, 2016; Harris, 2002; Leeker & Carlozzi, 2014). In fact, when developing the current study, we found it very difficult to locate or create visual stimuli depicting CNM that appeared truly consensual. Thus, it was for this very reason that we decided to incorporate only lexical stimuli into our ST-IATs, not visual stimuli.

In addition, it is unclear why the current results did not replicate those found when using self-report measures to assess differences in attitudes toward CNM related to sexual orientation (Cohen & Wilson, 2017; Mark et al., 2014; Sizemore & Olmstead, 2018). However, it could be a result of the constructs being assessed in the studies employing self-report measures and those employed in the current study. In fact, it has been posited that implicit and explicit attitudinal measures assess distinct but related constructs (Nosek, 2007). In particular, according to Banaji, Nosek, and Greenwald (2004), implicit associations are said to reflect accumulated or cultural experiences that may not be consciously available, whereas explicit evaluations are those in which one deliberately thinks about and reports. Thus, it is possible that both heterosexual and sexual minority early emerging adults have negative implicit associations with CNM because (1) implicit evaluations are argued to stem from cultural experiences (those obtained through years of socialization) and (2) mononormative social messages dispelled in Western cultures may be similar across sexual orientations. On the contrary, discrepancies between heterosexual and sexual minority early emerging adults likely emerge when measurement methods allow for conscious introspection (i.e., self-report measures) because of discrepancies associated with daily interactions and experiences. This explanation is consistent with studies adopting implicit measures to assess attitudes related to race. In particular, research indicates that black adults report an explicit preference for black faces and white adults report an explicit preference for white faces, yet both black and white adults demonstrate an implicit preference for white over black faces (Ashburn-Nardo, Knowles, & Monteith, 2003; Gibson, Rochat, Tone, & Baron, 2017; Nosek, Banaji, & Greenwald, 2002).

Previous Experience with Consensual Non-Monogamy

Consistent with previous research (Kenyon et al., 2018; Thompson et al., 2018a), individuals who reported having experience with CNM demonstrated more positive implicit associations than did those without experience. We believe that this is, perhaps, a function of the mechanisms behind cognitive dissonance theory (Festinger, 1957), in which prior actions affect preferences, attitudes, and beliefs in order to avoid the discomfort associated with a misalignment of actions and attitudes. In addition, the link between experience and attitudes could also be explained using the tripartite model of attitudes, which posits that there is an affective, behavioral, and cognitive component to attitudes (Breckler, 1984). In particular, attitudinal components are argued to vary on a common evaluative continuum in response to a specific stimulus. For example, with respect to CNM, those with more positive attitudes likely demonstrate more accepting overt behavior (i.e., previous experience) as well as endorse more accepting thoughts and beliefs (i.e., implicit associations).

Predicting Outcomes Using Consensual Non-Monogamy Associations

Although explicit associations were associated with interest in CNM and the extent to which participants were willing to allow a partner to participate in CNM, implicit associations were only

associated with the extent to which participants were willing to allow a partner to participate in CNM, not personal interest. Although it is unclear why implicit associations were only related to willingness to allow a partner to explore CNM, it may be related to an actor–partner bias in which people hold their romantic partner to a higher standard than themselves (Malle, 2006; Thompson & O'Sullivan, 2017). In fact, when assessing nonconsensual nonmonogamy (i.e., infidelity), Thompson and O'Sullivan (2017) discovered that adults were more likely to conceptualize a partner's extra-dyadic behavior as "unfaithful" in comparison with one's own comparable extra-dyadic behavior. This actor–partner discrepancy is likely also true with respect to CNM. In particular, those demonstrating negative associations with CNM can likely dismiss or rationalize their own interest (i.e., claiming it is just thoughts or that this interest will not amount to anything), but not the interest of their partners. Therefore, implicit associations are likely a better predictor of partner decisions in comparison with decisions pertaining to the self.

It is important to note that explicit associations were more strongly associated with our outcome variables than were implicit associations. This is likely because interest and willingness to allow for a partner's participation in CNM were assessed using self-report methods. Consequently, socially desirable responding may have also impacted reports of interest and willingness to allow a partner to participate. Perhaps when establishing the concurrent validity of the ST-IAT, actual behavioral responses or implicit measures would have produced more robust results.

Limitations and Future Directions

There are a number of limitations to this study that are worth noting. First, the sample for the current study was fairly homogenous, including only 18–21 years of age attending two mid-sized midwestern universities. Thus, our results may not be generalizable to samples from various geographic locations, ages, etc. Relatedly, our sample included only a small number of early emerging adults identifying as a sexual minority. Consequently, despite research indicating that attitudes toward CNM vary across sexual minority identities (Cohen & Wilson, 2017; Mark et al., 2014), these nuanced analyses could not be performed. To address these concerns, replication studies are needed that recruit diverse samples comprising individuals of various ages and geographic locations. These types of replication studies would allow for a more complete picture of attitudes toward CNM and monogamy in terms of generational and geographic effects. Additionally, future research should work to recruit more diverse samples in terms of sexual orientation to allow for an examination of whether differences in CNM attitudes exist based upon this variable.

Second, although the current study adopted a novel IAT (the ST-IAT) to assess implicit associations with CNM, some scholars question its utility (e.g., Blanton & Jaccard, 2006).) Despite the fact that the IAT is the most widely used method for assessing implicit attitudes, emerging research has demonstrated some commendable qualities to other paradigms measuring implicit attitudes, such as the Affect Misattribution Procedure (AMP; Nosek, Hawkins, & Frazier, 2011; Payne, Cheng, Govorun, & Stewart, 2005; Payne & Lundberg, 2014). In addition, some of the stimuli used in the CNM ST-IAT (e.g., "orgy," "group sex") may have elicited feelings of sexual arousal, whereas those used in the monogamy ST-IAT may not have (e.g., "soul mates," "romantic pair"). Consequently, the associations made in the CNM ST-IAT may have reflected sexual preferences that are related to CNM as opposed to attitudes to relationship structure itself. Furthermore, it is not clear the extent to which these implicit associations predict real-world discrimination and prejudicial behavior. Thus, studies attempting to replicate the present study should consider the use of various paradigms and stimuli to assess implicit attitudes. Further, studies extending these findings to determine the extent to which implicit associations predict discrimination are necessary.

Third, many of the effects reported in the current study were small and therefore the practical significance is questionable. In particular, implicit associations with CNM only accounted for 2% of the variance in willingness to allow a partner to explore CNM. Therefore, future research should work to replicate the results of the present study in order to determine whether they are robust to replication.

Finally, floor effects in some of the measures adopted in the current study may have interfered with our ability to determine the concurrent validity of the ST-IAT. For example, the mean scores on the scales measuring CNM interest and willingness to allow a partner to participate in CNM were incredibly low. Therefore, the extent to which implicit associations with CNM are related to these constructs may have been hindered by limited variability associated with our measurement tools. Scholars continuing research in this field should work to develop more sensitive measures in an attempt to more accurately capture the extent to which implicit associations with CNM correlate with behavioral outcomes.

Conclusions and Implications

In sum, the current study highlighted the need to delve deeper into attitudes toward CNM and monogamous relationships as well as to continue to utilize innovative research methods in these investigations. Though our results indicated that both men and women implicitly preferred monogamy, implicit associations with CNM were in fact neutral, not negative as previous research posited (Kenyon et al., 2018; Thompson et al., 2018a). This suggests that when perceived in comparison with monogamy, those in CNM relationships are likely perceived in a less positive light, as shown in previous research (Conley et al., 2013; Moors, Matsick, Ziegler, Rubin, & Conley, 2013), though not necessarily negatively. These attitudes likely indicate a preference for a more socially accepted behavior (i.e., monogamy) and indifference toward non-traditional

behavior (i.e., CNM). This assertion is supported by anecdotal evidence suggesting that although a substantial proportion of students believe CNM participants should be allowed to legally marry, only one-third believe CNM participants should have legal protection from discrimination (Scoats, 2018). This demonstrates the conflicting beliefs whereby students appear to be tolerant of CNM (indicated by most believing they should be allowed to marry), but also still perceive CNM as too non-traditional and not socially acceptable enough to warrant legal protection from discrimination. It is imperative that researchers continue to investigate these conflicting viewpoints, as they strongly suggest that there is social stigma against CNM participation.

There is compelling evidence indicating that this social stigma is prevalent in the U.S. For instance, although most CNM clients report exemplary practices when seeking therapy (e.g., their therapist was unafraid to address their relationship status; their therapist helped them to feel good about their relationship status), research indicates that they also report experiencing less-than-ideal (e.g., a lack of therapist knowledge on CNM issues, the presumption of the client's monogamous orientation) and inappropriate therapeutic practices (e.g., judgmental attitudes, putting pressure on a client to end their CNM relationship; Schechinger, Sakaluk, & Moors, 2018). In fact, some clients even reported feeling unsafe discussing CNM with their therapist. Though the results of this study revealed that inappropriate practices were less common as compared to exemplary practices, there is still much room for improvement. Thus, a greater understanding of implicit associations with CNM would aid in the efforts to improve therapeutic practices when engaging with CNM clients, and future research should investigate mechanisms of change related to these attitudes. Further, it would behoove researchers in this area to develop and assess implicit bias workshops designed to raise awareness of CNM stigma particularly among clinicians and practitioners.

Despite the negative implications of the neutral implicit associations reported in the current study, a surge in interest and advocacy related to CNM has emerged in both research and therapeutic practice as of recent. This is evidenced by the recent creation of a Consensual Non-monogamy Task Force within Division 44 of the American Psychological Association (2018). The task force, developed in 2018, focuses on addressing the needs of people practicing CNM and cultivating social change in order to allow these individuals the ability to engage in their desired relationship without stigmatization. Through advocacy, research, and resource development, the task force aims to include CNM in research, education and training, public interest, and the practice of psychology. It is with this common goal and the knowledge of the impact of minority stress that warrants further research.

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Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Appendix A

Stimuli Used in the ST-IATs

The word lists that will be used in the current study are listed below.

Consensual Nonmonogamy Stimuli
/1 = "Open Relationship"
/2 = "Partner Swapping"
/3 = "Group Sex"
/4 = "Orgy"
/5 = "Group Marriage"
Monogamy Stimuli
/1 = "Exclusive Relationship"
/2 = "Traditional Marriage"
/3 = "Romantic Couple"
/4 = "Romantic Pair"
/5 = "Soul mates"
"Positive" Stimuli
/1 = "Good"
/2 = "Happy"
/3 = "Enjoyable"
/4 = "Pleasant"
/5 = "Nice"
"Negative" Stimuli
/1 = "Bad"
/2 = "Wrong"
/3 = "Awful"
/4 = "Unpleasant"
/5 = "Evil"

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