



# Personality and Mating Orientations in Monogamy and Consensual Non-Monogamy in Young Spanish University Students

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## Abstract

Consensual non-monogamy (CNM) is a non-normative relationship that can generally be defined as relationships in which the involved individuals have openly agreed that they can have other sexual and/or affective partners. Despite growing interest in CNM, little research has been conducted regarding characteristics of the involved individuals, as well as comparing CNM individuals and monogamous individuals' characteristics. Expanding this research is important, as CNM constitutes a sizeable minority group, and CNM individuals and relationships are subject to stigma and dehumanization. The present study compared CNM and monogamous individuals in terms of personality (including “dark” personality) and mating orientations (sociosexuality and long-term mating) in young Spanish university students. Main results indicated that CNM individuals did not differ much in personality nor were they prone to higher “dark” personality traits when compared to monogamous individuals. Regarding mating orientations, CNM individuals were prone to higher sociosexuality levels and lower levels of long-term mating. Interestingly, results showed positive correlations between sociosexuality and “dark” personality in monogamous individuals, but not in CNM individuals. In conclusion, young Spanish university CNM individuals seem to be more pro-sex than monogamous people and less committed to the romantic love narrative of long-term mating, but these individuals were not more untrustworthy, self-centered, ruthless, or malevolent. Results were also discussed regarding their implications in the stigma and dehumanization of CNM people.

**Keywords** Personality · Dark personality · Mating orientations · Consensual non-monogamy

## Introduction

Consensual non-monogamy (CNM) is an umbrella term for relational orientations different from monogamy where individuals have openly agreed that they can have other sexual and/or affective partners (e.g., Barker & Landridge, 2010; Conley et al., 2013a, 2013b). Some types of CNM are polygamy, polygyny, polyandry, swinging, open relationships (Veaux et al., 2014), polyamory (Cardoso et al., 2021),

relationship anarchy (de las Heras, 2018), and agamy (see Barker, 2012, for a review).

Currently, CNM seems to be a sizeable minority group, as its prevalence (in USA and Canadian population) is estimated at 2.5–5% of CNM practitioners (Conley et al., 2013a, 2013b; Fairbrother et al., 2019; Hauptert et al., 2016; Rubin et al., 2014), and 12% who would like to engage in CNM (Fairbrother et al., 2019). As CNM represents a hard-to-reach population, for obvious reasons, studies targeting this population do not reflect the real prevalence (e.g., Lecuona et al., 2021). There are no accurate prevalence studies in the Spanish culture.

Regarding demographics, some studies report gender and sexual orientation differences; apparently, there is a higher presence of men and sexual minorities engaging in CNM (Hauptert et al., 2017; Parsons et al., 2012; Séguin et al., 2016) although, within sexual minorities, both women and men are equally interested in these types of relationships (Moors et al., 2014).

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The interest and/or curiosity about CNM is increasing in Western cultures (Moors et al., 2017). This may be partly because CNM represents an alternative to monogamy and its transgressions (i.e., cheating or non-consensual non-monogamy). For example, the proposal of a more honest framework for intimate relationships with emphasis on mutual responsibility, explicit agreements, and collective care. However, despite this growing interest, as yet, little research has been conducted on the characteristics of the individuals involved in CNM, as well as comparing CNM individuals' and monogamous individuals' characteristics (Witherspoon & Theodore, 2021). We consider that the exploration of psychological characteristics of CNM individuals in comparison with monogamous individuals is relevant to expand knowledge about people who decide to engage in this type of relationship.

Likewise, it is relevant to explore CNM in different cultures, as most quantitative empirical studies on CNM focus on the North American culture (e.g., see a brief history of the research in Hamilton et al., 2021), and only a few are conducted in other cultures such as the Portuguese, Italian, Croatian, and Spanish cultures (e.g., Cardoso et al., 2020; Cubells-Serra et al., 2021; Lecuona et al., 2021; Rodrigues et al., 2018). Research on psychological characteristics is also relevant because prior evidence shows that CNM relationships and individuals are highly subject to stigma and dehumanization (i.e., being considered as less trustworthy and more immoral) without evidence (or even with contrary evidence) (e.g., Conley et al., 2013a, 2013b; Moors et al., 2021; Rodrigues et al., 2021, 2022). Thus, evidence collected to shed light on the psychological characteristics is twice as relevant to that matter. Therefore, in the following sections, we will review the existing evidence regarding personality—including dark personality—and mating orientations, comparing monogamous and CNM individuals.

### Personality and Dark Personality

Personality research considers the Big Five as the main model that describes individual differences in many important patterns of thinking, feeling, and behaving. Recently, within the Big Five model, the Big Five Inventory (BFI) has been revised and the Big Five Inventory-2 (BFI-2) has been developed (Soto & John, 2017a, 2017b). The BFI-2 comprises extraversion (representing sociability, assertiveness, and high energy levels), agreeableness (representing compassion, respectfulness, and trust), open-mindedness (comprising intellectual curiosity, aesthetic sensitivity, and creative imagination), negative emotionality (related to subclinical levels of anxiety, depression, and emotional volatility), and conscientiousness (which includes aspects of organization, productiveness, and responsibility).

Prior literature proposes CNM individuals as potentially more agreeable, open-minded, and extraverted individuals (Conley et al., 2013a, 2013b) due to the pro-social and open-minded narratives within some CNM groups. However, there is scarce evidence collected so far regarding personality traits. Concretely, to our knowledge, only the research by Lecuona et al. (2021) addressed the study of (Big Five) personality traits comparing CNM and monogamous individuals. In this regard, this study only observed small differences in open-mindedness (higher in CNM) and conscientiousness (lower in CNM) but no differences in agreeableness, extraversion, or negative emotionality were found. In this study, the CNM sample was collected by contacting CNM associations, which might underrepresent CNM individuals not involved in CNM communities, with a possible self-selection bias (Lecuona et al., 2021). Thus, it seems clear that more studies are needed to explore potential differences in personality.

Regarding dark personality, “dark” personality traits (i.e., Machiavellianism, Narcissism, and Psychopathy) were firstly proposed in the literature from different and independent theoretical roots (Jones & Paulhus, 2014). Subsequently, these traits were coined as the “Dark Triad” to systematically study all three traits conjointly (Paulhus & Williams, 2002). More recently, other authors proposed a general dark factor of personality (D) as a more comprehensive construct. D was defined as “the general tendency to maximize one’s individual utility—disregarding, accepting or malevolently provoking disutility for others—accompanied by beliefs that serve as justifications” (Moshagen et al., 2018, p. 657). D stems from nine traits: Egoism, Machiavellianism, Moral Disengagement, Narcissism, Psychological Entitlement, Psychopathy, Sadism, Self-interest, and Spitefulness (for definitions, see Moshagen et al., 2018).

As above-mentioned, CNM individuals are subject to stigma and perceived as less trustworthy individuals (i.e., Rodrigues et al., 2022). Thus, stigma attributes darker personality to CNM individuals. However, this is not supported for any evidence. To our knowledge, no studies have been performed comparing CNM individuals and monogamous individuals in dark personality traits, so the present study should shed light on that matter.

### Short- and Long-Term Mating Orientations

Short-term mating, also called sociosexuality, refers to the willingness to engage in uncommitted sexual relations (Simpson & Gangestad, 1991). This concept presents a continuum that has two poles: sexually unrestricted (highly interested in casual sex or short-term mating) and sexually restricted (not interested). It is divided into three components: past behavior, attitudes toward casual sex, and desire to engage in casual sex or short-term relations (Penke & Asendorpf, 2008). As individuals involved in CNM relationships have openly agreed

that they can have other sexual and/or affective partners, it is reasonable to expect them to display higher sociosexuality than individuals involved in a monogamous relationship. In fact, the previous literature shows that CNM individuals present higher levels of sociosexuality than monogamous people (e.g., Balzarini et al., 2020; Rodrigues et al., 2019), so we expect the same results in this line.

An intuitive approach to short-term mating proposes its opposite as long-term mating orientation (LTMO). LTMO is defined as the desire or effort to develop and maintain committed romantic relationships, with substantial emotional investments and sexual exclusiveness (Buss, 2016; Shukusky, 2013). Whereas classical models assume this framework, recent models propose long-term mating as a different construct, with a moderate inverse relation to short-term mating (Holtzman & Strube, 2013; Jackson & Kirkpatrick, 2007).

We highlight that LTMO instruments measure the construct with direct connotations of the romantic love narrative. For example, accepting the intimate partner as “the one,” hoping the relationship will last forever or the rest of the one’s life, questions about “settling down romantically with one special person,” etc. (see original items in Jackson & Kirkpatrick, 2007). These narratives (i.e., referring to exclusiveness, “the one,” and the use of phrases like “settling down” as the opposite of agitated, misbehaving, or acting up) with their implications are questioned by the feminist, LGBTIQ+, and CNM movements (Barker, 2012; García-Andrade et al., 2018; Grossi, 2018; Jackson, 1995; Ziegler et al., 2014). Although there is no reason a priori to expect less commitment in CNM relationships, there is less commitment to exclusiveness and aspects related to the romantic love narrative. In addition, a recent study showed that individuals involved in CNM relationships are less likely to endorse the romantic love narrative (Cubells-Serra et al., 2021). Thus, CNM individuals are expected to display lower LTMO than monogamous individuals. Nevertheless, we note that in that study, the CNM sample was recruited by convenience through a social network system, whereas our sample was not recruited specifically seeking CNM individuals in CNM movements and associations. Therefore, the CNM individuals in our sample may or may not be related or familiarized with CNM movements, and they might differ regarding whether or not they endorse the romantic love narrative.

In the same line, CNM narratives support and validate the option of more and different sexual and affective relationships, which is in line with expecting CNM individuals to score higher in sociosexuality than monogamous individuals. Prior evidence shows lower levels of LTMO (Mogilski et al., 2020). However, lower levels of LTMO do not necessarily mean exclusively casual sex without intimacy or commitment, as the narrative of romantic love does not necessarily apply to CNM standards (i.e., Mogilski et al., 2020; Vasallo, 2018). Therefore, the real intimacy, commitment,

and duration of CNM relationships may not be different from those of monogamous relationships even though LTMO might be lower in CNM individuals.

## Dark Personality and Mating Orientations

Dark personality traits and sociosexuality are positively and significantly correlated in several studies (e.g., Fernandez del Río et al., 2019; Garcia, 2020; Moore et al., 2020), whereas LTMO usually shows negative but low correlations with dark personality (Holtzman & Strube, 2013; Tsoukas & March, 2018). Might the personality of CNM individuals be “darker,” considering that evidence shows that they usually display higher sociosexuality and lower LTMO? This needs to be unraveled, as there is no evidence differentiating monogamous and CNM individuals. For example, other variables related to sociosexuality do not apply equally to monogamous and CNM individuals. This is the case, for instance, of the relationship between sociosexuality and relationship satisfaction, which is negatively associated in monogamy because of the higher risk of infidelity (Rodrigues et al., 2016a, 2016b), but not in CNM (Mogilski et al., 2020; Morrison et al., 2013; Rodrigues et al., 2016b). In addition, CNM movement involves a new narrative about care, honest negotiations, and arrangements as important values (Fern, 2020; Pérez Cortés, 2020), which seem a priori quite incompatible with higher levels of D.

Therefore, we suggest that CNM individuals might not score higher in dark personality although they might score higher in sociosexuality and lower in LTMO than monogamous individuals. In any case, this should be tested empirically, as there is not enough evidence exploring this issue.

## Present Study

The present study aims to contribute with evidence regarding the characteristics of individuals involved in CNM in comparison with individuals involved in monogamous relationships, by exploring personal and interpersonal psychological characteristics, such as personality traits (including dark personality traits) and mating orientations in young university students in Spain. Thus, it aims to contribute to expanding knowledge of CNM, and in other cultures other than the North American one.

We present the following hypotheses: Compared to their monogamous counterparts, CNM individuals will present: (1) slightly higher open-mindedness and lower conscientiousness, similar extraversion, agreeableness, and negative emotionality; (2) similar dark personality traits; (3) higher sociosexuality in all three components (behavior, attitudes, and desire); (4) and a lower long-term mating; although (5) no differences in current relationship duration will be observed. Although we have presented these hypotheses, we

consider this study to be exploratory (as proposed by Scheel et al., 2021).

## Method

### Participants and Procedure

The initial sample comprised 1,996 participants. Based on criteria from previous studies with university samples (Barrada & Castro, 2020; Barrada et al., 2021), five inclusion criteria were used: (1) to be studying a university degree at the time of data collection (76 participants excluded); (2) aged between 18 to 26 years (128 participants excluded); (3) labeling themselves as woman or man (13 participants excluded; the small sample size of this group prevented us from incorporating these participants in our analyses); (4) correctly answering a control question (74 participants excluded; see below); and (5) reporting a relationship status of being involved in a current intimate relationship, and explicitly specifying whether monogamous or CNM (902 participants excluded, as they were not in any relationship). We decided to maintain consistency concerning previous studies with similar samples to reduce researchers' degrees of freedom and, thus, avoid potential *p*-hacking (Wicherts et al., 2016). With the first and second criteria, we expected to create a more homogenous sample, with a clearer definition of the target population, that is, Spanish university students. In addition, the second criterion allowed us to remove outliers in terms of age and potential problems of a mixture of different populations, as it can be expected that students in the age range of [18, 26] and older students probably differ in many critical variables.

Considering all these criteria, the final sample included 803 university students (76.84% women, 23.16% men), aged between 18 and 26 ( $M = 20.90$ ,  $SD = 2.10$ ). Of the participants, 72.23% described themselves as heterosexual, 22.42% as bisexual, 4.36% as homosexual, and 1.00% as other sexual orientations. Due to the small sample sizes of non-heterosexual groups, those participants were combined into a sexual minority category (27.77%). Concerning relationship status, 92.65% practiced monogamy with their partner, 5.73% reported being in an open relationship, and 1.62% in polyamory. Likewise, in sexual orientation, participants in CNM relationships were combined in a CNM category (7.35%) due to the small sample sizes of the subgroups. The current relationship showed a median duration of 21 months (Median Absolute Deviation = 15).

Regarding the procedure, data were collected in December 2019, using a Google Forms survey. To reach participants, a link to the survey was distributed through student e-mail lists of the authors' university. This prevents CNM practitioners' high rates of self-selection bias, as we did not reach CNM

communities (which could offer larger sample sizes for CNM but also more socially mobilized individuals). Participants provided informed consent after reading the description of the study, where the anonymity of the responses was clearly stated. The survey remained open for 14 days. This procedure was approved by the Ethics Review Board for Clinical Research of the region (PI18/058).

### Measures

#### Sociodemographic Variables

We asked participants about their gender (woman, men, other), age, sexual orientation (heterosexual, homosexual, bisexual, other), whether they were in a relationship (if they were, for how long), and if they were, what type of relationship it was: monogamous (agreement of sexual and affective exclusivity), open relationship (agreement of extradyadic sexual partners), or polyamorous (agreement of extradyadic affective and sexual partners). Therefore, participants reported if they were in a relationship (or not, being single as exclusion criterion), no matter the number of partners involved. Regarding the current duration in case they were several partners involved, the question was supposed to implied the longest current duration.

For all self-reports, scores of each dimension were computed as the means of their respective items, and higher scores are interpreted as a higher level in the respective dimension.

#### Short Form of the Big Five Inventory-2

This instrument (BFI-2; Soto & John, 2017a), the short form of the original BFI-2 (Soto & John, 2017b), has 30 items that assess the Big Five domains: negative emotionality (e.g., “[I am someone who...] is moody, has up and down mood swings”); extraversion (e.g., “is outgoing, sociable”;  $\alpha = 0.71$ ); open-mindedness (e.g., “is curious about many different things”); agreeableness (e.g., “is compassionate, has a soft heart”); and conscientiousness (e.g., “is systematic, likes to keep things in order”). These items are rated on a five-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). We used the Spanish translation of Gallardo-Pujol and colleagues (Gallardo-Pujol et al., 2021). Reliability indices of these and the following scores are provided in Table 2 (all showing adequate values of  $\alpha > 0.70$ , except for Agreeableness, with a value of  $\alpha = 0.67$ ).

#### Dark Factor of Personality-16

This instrument (Moshagen et al., 2020), a short form of the full 70-item version, has 16 items that assess the dark factor of personality with a single factor D (e.g., “People who mess with me always regret it”). These items are rated

on a five-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*.) Following the original instructions, items were presented in random order for each participant (Moshagen et al., 2020). We used the Spanish translation of Castro and colleagues (Castro et al., 2020).

### Sociosexual Orientation Inventory-Revised

This instrument (SOI-R; Penke & Asendorpf, 2008) has nine items that assess sociosexual/short-term orientation through three dimensions: behavior (e.g., “In the last twelve months, with how many different partners have you had sexual intercourse without having and interest in a long-term committed relationship with this person?”), attitudes (e.g., “Sex without love is OK.”), and desire (e.g., “How often do you have fantasies about having sex with someone with whom you do not have a committed romantic relationship?”). These items are rated on a nine-point scale, ranging from 1 (*never*) to 9 (*20 or more times*) for the behavioral factor; from 1 (*strongly disagree*) to 9 (*strongly agree*) for the attitudes factor; and from 1 (*never*) to 9 (*at least once a day*) for the desire factor. We used the Spanish validation (Barrada et al., 2018) with a modification in the behavioral dimension. While in the original Spanish validation, no specific time frame is provided, in the present data collection, we specified a 12-month period to avoid age effects.

### Long-Term Mating Orientation Scale

This instrument (LMTO; Jackson & Kirkpatrick, 2007) has seven items that assess long-term mating orientation with a single factor (e.g., “I hope to have a romantic relationship that lasts the rest of my life”;  $\alpha = 0.87$ ). These items are rated on a seven-point scale, from 1 (*strongly disagree*) to 7 (*strongly agree*). We used the Spanish translation of Barrada et al. (2021).

### Control Question

Embedded in the questionnaire and to check whether the participants paid enough attention to the wording of the items, we introduced an item asking the participants to respond to it with “strongly disagree.” Those participants responding with a different option were considered to be distracted.

### Data Analysis

Firstly, we computed self-report scores for each instrument, using item means due to intuitive interpretation, as they all shared the range of their respective Likert scales. Then, we computed descriptive statistics and associations between the variables. To explore differences in demographic variables, we implemented contingency tables and robust independent

sample *t* tests (Welch’s *t* test) with their respective contrasts and effect sizes. A power analysis for our smallest sample size ( $n = 59$ ) revealed, with 80% power and 95% confidence, minimum detectable values of  $\chi^2 = 11.07$  for categorical variables (e.g., gender), and  $t = 1.96$  for continuous variables (i.e., age). Values under these thresholds should be considered underpowered. For self-report measures, we implemented bivariate correlations (Pearson’s *r* as default, and Spearman’s  $\rho$  if the variables were non-normal). We also tested for differences in correlations between monogamous and CNM participants (Olkin & Finn, 1995), along with 95% confidence intervals for correlations between the dark core and sociosexuality. A power analysis revealed, with 80% power and 95% confidence, minimum detectable values of  $z = 1.96$  with our sample sizes. Due to pronounced differences between sample sizes in monogamous and CNM practitioners, we prioritized the degree of correlations in our interpretations instead of significance testing.

We acknowledged that regular tests are built under the null hypothesis statistical testing (NHST) framework. This is, significant results would account for differences or associations existing in the population as likely, whereas non-significant results would not account for the absence of differences or associations in the population, but a lack of evidence of said differences or associations. This can be expressed as evidence of absence is not absence of evidence, where NHST provides absence of evidence, not evidence of absence (which is the aim of this study). Thus, the NHST framework does not test explicitly for groups showing significantly equivalent parameters, which are central in our hypotheses. To address this issue, we implemented two one-sided tests, or TOSTs (e.g., Lakens, 2017; Lakens et al., 2018) to compare CNM practitioners with monogamous practitioners (following Sakaluk et al., 2021). TOSTs allow to test whether two groups are significantly equivalent (i.e., differences between parameters statistically equal to zero or with negligible differences), but also whether they are significantly different (through a regular NHST). Therefore, TOSTs provide evidence of absence of differences, but also evidence of the presence. For this purpose, TOSTs require upper and lower bounds that outline a zone of negligible, non-meaningful differences (i.e., differences too small to interpret as relevant). For mean differences of self-reports, we proposed two different bounds as containing significant differences: (1) values that achieved 80% power; (2) values greater in absolute value than the 0.5 pooled SDs of each outcome variable. The first bounds specified a Cohen’s *d* of  $\pm 0.538$  for our sample size, which corresponds to raw score bounds from  $\pm 0.24$  to  $\pm 1.09$ . The second bounds were specified in raw scores from  $\pm 0.21$  to  $\pm 1.11$  (detailed display in Table 2). Both bounds will be interpreted, and we will prioritize bounds set for 80% power. All TOSTs were computed as Welch’s robust *t* test for continuous dependent variables.

**Table 1** Descriptive statistics of demographic characteristics in the total sample and between monogamous and CNM practitioners

Variable	% by column		
	Total simple ( <i>n</i> = 803)	Monogamous ( <i>n</i> = 744) 92.65%	CNM ( <i>n</i> = 59) 7.35%
Gender		$\chi^2(2) = 0.05, p = .831, V = .008$	
Female	76.83	76.74	77.96
Male	23.16	23.25	22.03
Sexual orientation		$\chi^2(2) = 50.86, p < .001, V = .252$	
Heterosexual	72.30	75.40	32.20
Sexual minorities (total)	27.77	24.60	67.80
Age		$t(801) = -0.66, p = .512, d = -0.09$	
	<i>M</i> = 20.89 <i>SD</i> = 2.09	<i>M</i> = 20.82 <i>SD</i> = 2.09	<i>M</i> = 21.07 <i>SD</i> = 2.07
Current relationship		$W = 23,171.5, p = .245, r = .092$	
	<i>Mdn</i> = 21.00 <i>MAD</i> = 15.00	<i>Mdn</i> = 21.50 <i>MAD</i> = 14.50	<i>Mdn</i> = 18.50 <i>MAD</i> = 16.00

$\chi^2$  = Pearson's Chi-square test statistic; *V* = Crammer's *V*; *t* = Student's *t* test statistic; *d* = Cohen's *d*; *W* = Mann-Whitney's *W*; *r* = rank biserial correlation; *M* = Mean; *SD* = Standard deviation; *Mdn* = Median (selected if skewness > |1|); *MAD* = Median absolute deviation

**Table 2** Bivariate correlations and descriptives of self-report variables for monogamous (lower triangle) and CNM practitioners (upper triangle)

	1	2	3 <sup>p</sup>	4	5	6 <sup>p</sup>	7 <sup>p</sup>	8 <sup>p</sup>	9	10	11
1. Negative emotionality	(.79)	-.37**	-.25	-.29*	-.30*	.11	-.01	-.04	-.14	.09	-.08
2. Extraversion	-.23***	(.70)	.31*	.18	.23	-.09	-.01	.16	.09	-.06	-.24
3. Open-mindedness	.09*	.18***	(.73)	.03	-.13	-.12	-.01	-.04	.21	-.01	-.08
4. Agreeableness	-.17***	.18***	.18***	(.67)	.22	-.61***	-.13	-.07	-.09	.10	.01
5. Conscientiousness	-.21***	.21***	.06	.25***	(.79)	-.08	-.04	-.10	.01	-.04	.02
6. Dark core	-.01	-.03	-.16***	-.58***	-.13***	(.73)	.06	-.07	.07	.19	.01
7. Sociosexual behavior <sup>p</sup>	-.03	.11**	.00	-.03	-.06	.05	(.92)	.26*	.31*	-.19	.27*
8. Sociosexual attitudes	-.06	.02	-.03	-.12***	.18***	.07*	.22***	(.80)	.24	-.31*	.13
9. Sociosexual desire <sup>p</sup>	-.05	.04	.05	-.14***	.11**	.20***	.23***	.45***	(.84)	-.16	.08
10. Long-term mating <sup>p</sup>	-.02	.03	-.03	.13***	.13***	-.08*	-.15***	-.34***	-.33***	(.82)	.27*
11. Age	-.09*	-.02	.02	-.01	.03	-.01	.03	.12***	.04	-.03	-
Mean (Monogamous)	3.15	3.28	3.80	3.93	3.40	1.70	1.33 <sup>a</sup>	5.96	2.17 <sup>a</sup>	6.14 <sup>a</sup>	20.82
<i>SD</i> (Monogamous)	0.83	0.74	0.71	0.61	0.79	0.40	0.33 <sup>b</sup>	2.21	0.83 <sup>b</sup>	0.71 <sup>b</sup>	2.01
Mean (CNM)	3.22	3.24	4.17 <sup>a</sup>	3.88	3.04	1.62 <sup>a</sup>	2.00 <sup>a</sup>	8.33 <sup>a</sup>	4.42	4.72	21.07
<i>SD</i> (CNM)	0.86	0.75	0.50 <sup>b</sup>	0.59	0.88	0.25 <sup>b</sup>	0.67 <sup>b</sup>	0.67 <sup>b</sup>	1.65	1.59	2.07

<sup>p</sup>Spearman's rho applied to all values of the row or column of their respective triangle; Diagonal bracketed values are reliability estimates (McDonald's  $\omega$ ); <sup>a</sup>Median; <sup>b</sup>Median absolute deviation; *SD* = Standard deviation; Boldface are correlations > |.3|

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

The outcomes of TOSTs are: (1) Two TOST *t* test statistics (testing whether differences pass the upper or lower bounds), and (2) a regular NHST *t* test statistic (testing for significant differences from zero). In addition, each mean difference provides 95% confidence intervals for TOST and NHST. While significant NHSTs are interpreted as evidence indicating mean differences as different from zero, significant TOSTs are interpreted as evidence indicating mean

differences as statistically equivalent to zero (this is, over the specified bounds in the population, either the upper or lower bound). To offer clear interpretations, we include, for all TOSTs, a simple statistical conclusion (using the bounds set for 80% power): "Equivalent" if the TOSTs display significant *p*-values and confidence intervals do not reach the bounds, or "not equivalent" if the TOSTs display non-significant *p*-values or confidence intervals reaching the bounds.

We also include a meaningful conclusion (using the bounds set for 0.5 pooled SDs): “Not relevant” if the TOSTs display confidence intervals do not reach the bounds, or “relevant” if the TOSTs display confidence intervals reaching the bounds. Plots are provided for an intuitive display.

Analyses were performed with JASP (version 0.13.1.0, 2020), and TOSTs were performed with the *TOSTER* package (Lakens, 2017), and difference tests in correlations were computed using the *psych* package (Revelle, 2021) of the R environment (version 4.0.2; R Development Core Team, 2020). All power analyses except for TOSTs were computed using G\*Power (version 3.1, Faul et al., 2009). No missing data were present in our database. The open database and code files for these analyses are available at the Open Science Framework repository (<https://osf.io/3nxv4>). Finally, note that this database was used previously but with other variables and scope than in this manuscript.

## Results

Descriptive statistics for demographic variables are displayed in Table 1. Gender did not present significant differences, with 77.96% women in CNM relationships versus 76.74% women in monogamous relationships, and 22.04% men in CNM versus 23.24% men in monogamous relationships. This suggests that CNM individuals do not present different proportions of female or male gender from monogamous practitioners. Regarding sexual orientation, the CNM group had significantly fewer heterosexuals (about 32% in CNM vs. about 75% in monogamous relationships), and consequently more minority individuals (about 68% in CNM) than the monogamous group (Table 1). Age did not show significant differences between monogamous and CNM participants (the mean of both groups is about 21 years). Finally, regarding the duration of the current relationship, neither monogamous nor CNM practitioners displayed significantly different durations of their current relationship (both groups with values of about 22 months).

Concerning the self-report measures (Table 2), descriptive statistics showed the expectable values: central values in big five personality traits (about 3 on a 1-to-5 Likert scale), and low values in dark traits (about 2 on a 1-to-5 Likert scale) both for monogamous and CNM practitioners. Sociosexual behavior was slightly lower in monogamous participants (1.33 for monogamous vs. 2.00 for CNM on a 1-to-9 Likert scale), and attitudes and desire were also lower in monogamous participants (about 6 for monogamous vs. 8 for CNM, and about 2 for monogamous vs. 4.5 for CNM on a 1-to-9 Likert scale).

Finally, LTMO was higher in monogamous practitioners (about 6 for monogamous vs. about 5 for CNM on a 7-point Likert scale). Both groups showed mostly similar expectable

correlations. D and sociosexuality dimensions yielded non-significant correlations in CNM practitioners (all  $ps > 0.05$ ), whereas the D correlated significantly with sociosexual attitudes ( $\rho = 0.07$ ) and desire ( $\rho = 0.20$ ). However, comparing correlations of the D and sociosexuality between CNM and monogamous practitioners yielded non-significant differences for sociosexual behavior ( $z = 0.07$ ,  $p = 0.94$ , 95% CI  $[-0.20, 0.31]$  for CNM, and  $[-0.02, 0.12]$  for monogamous practitioners), attitude ( $z = 1.01$ ,  $p = 0.31$ , 95% CI  $[-0.32, 0.19]$  for CNM, and  $[0.01, 0.15]$  for monogamous practitioners), and desire ( $z = 0.96$ ,  $p = 0.34$ , 95% CI  $[-0.19, 0.32]$  for CNM, and  $[0.13, 0.27]$  for monogamous practitioners). Nevertheless, given the sample size of the CNM group, the results are underpowered (all tests below thresholds for 80% power), so these differences are interpreted as probably biased.

Regarding TOSTs (Table 3), results showed significantly equivalent and not different values between monogamous and CNM practitioners in personality traits and dark traits. That is, significant TOSTs ( $p < 0.05$ , and 90% confidence intervals not overlapping with the equivalence bounds) and non-significant NHSTs ( $p > 0.05$ , and 95% confidence intervals not reaching the equivalence bounds). However, open-mindedness and conscientiousness presented different behaviors. Open-mindedness provided inconsistent evidence, as it showed a significant equivalence test ( $p < 0.05$ , and 90% confidence intervals almost not overlapping the equivalence bounds), but also a significant NHST test ( $p < 0.05$ , and 95% confidence intervals reaching the equivalence bounds). Considering that “statistical equivalence” is defined as negligible differences, we interpret the evidence as a possible but uncertain small difference in open-mindedness. Conscientiousness provided a significant difference between monogamous and CNM practitioners, but also a non-equivalent difference both for 80% power and meaningful bounds. This can be interpreted as monogamous practitioners showing modestly higher scores in conscientiousness than CNM practitioners. However, as the mean difference estimate does not exceed the boundaries (0.32 on a 5-point scale), we identify this potential difference as uncertain.

Regarding sociosexuality, all three variables (behavior, attitudes, and desire) showed significant differences and non-equivalent differences both for 80% power and meaningful boundaries. Moreover, sociosexual attitudes and desire showed mean difference estimates, and their confidence intervals exceeded the set boundaries. This can be interpreted as CNM individuals showing considerably higher scores in sociosexual attitudes and desire (mean differences of 1.81 and 1.75 on a 9-point scale, respectively). However, sociosexual behavior presents a mean difference estimate and lower limit of its confidence intervals exceeding the equivalence bounds, but not its upper limit (see Fig. 1 for a graphical display). Thus, this difference (0.87 on a 9-point scale) seems more moderate. Finally, long-term mating showed a

**Table 3** TOSTs and NHST *t*-tests with confidence intervals and significance testing between monogamous and CNM practitioners

	Equivalence bounds (raw scores)		Mean difference	TOST 90%CI	NHST 95%CI	Statistical conclusion	Meaningful conclusion
	Set for 80% power	Set as meaningful (0.5 SDs)					
Negative emotionality	± 0.49	± 0.41	-0.08	[-0.27;0.11]***	[-0.31;0.15]	Equivalent, not different	Not relevant
Extraversion	± 0.43	± 0.38	0.04	[-0.13;0.21]***	[-0.16;0.24]	Equivalent, not different	Not relevant
Open-mindedness	± 0.41	± 0.36	-0.25	[-0.41;-0.09]*	[-0.44;-0.06]*	Inconclusive	Inconclusive
Agreeableness	± 0.35	± 0.32	0.06	[-0.07;0.19]***	[-0.10;0.22]	Equivalent, not different	Not relevant
Conscientiousness	± 0.48	± 0.40	0.32	[0.12;0.52]	[0.08;0.56]**	Not equivalent, different	Relevant
Dark core	± 0.24	± 0.21	0.02	[-0.07;0.11]***	[-0.09;0.13]	Equivalent, not different	Not relevant
Sociosexual behavior	± 0.81	± 0.67	-0.87	[-1.25;-0.48]	[-1.31;-0.41]***	Not equivalent, different	Relevant
Sociosexual attitudes	± 1.09	± 1.11	-1.81	[-2.16;-1.46]	[-2.23;-1.39]***	Not equivalent, different	Relevant
Sociosexual desire	± 0.91	± 0.94	-1.75	[-2.12;-1.38]	[-2.19;-1.31]***	Not equivalent, different	Relevant
Long-term mating	± 0.767	± 0.63	1.20	[0.85;1.55]	[0.78;1.62]***	Not equivalent, different	Relevant

Significance testing was set for equivalence bounds set for 80% power  
 \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

significant difference, but also a non-equivalent difference for 80% power and meaningful bounds. In addition, its mean difference estimates and confidence intervals are beyond both boundaries. This can be interpreted as the CNM group presenting considerably lower scores in long-term mating than monogamous practitioners (1.20 on a 7-point scale).

## Discussion

The main aim of this study was to explore potential differences between monogamous and CNM individuals in personality, dark personality, and mating orientations in young university students in Spain. In this sense, we hope to contribute evidence to expand knowledge about the personal and interpersonal characteristics of individuals involved in CNM relationships compared to individuals in monogamous relationships. Our data show that CNM and monogamous individuals present differences in mating orientations but they both present similar characteristics in personality and dark personality. Results showing that CNM and monogamous individuals are not different in dark personality is especially relevant, as literature in the area presents stigma and dehumanization of CNM individuals (i.e., Rodrigues et al., 2021), perceiving them as less trustworthy and more immoral

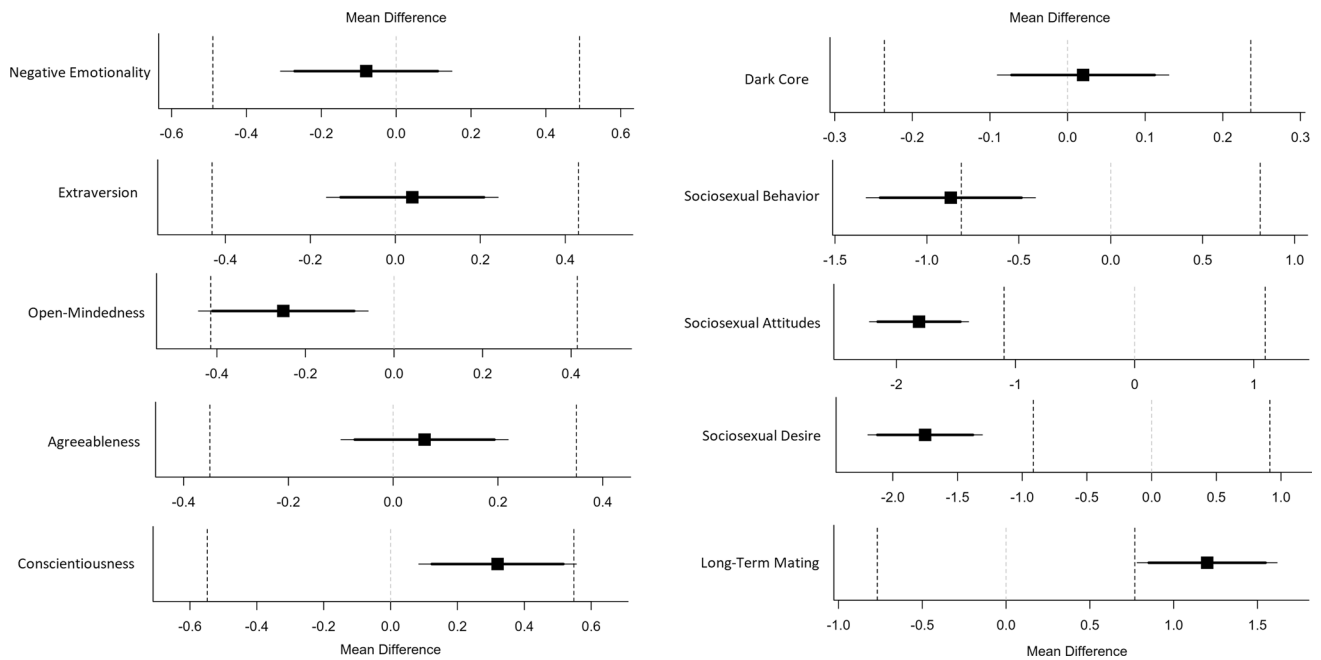
(among other negative characteristics). In the following paragraphs, we will discuss important aspects of our sample, as well as the main results in more detail.

## Prevalence and Demographics

Our sample was recruited within the university context and ranges from ages 18 to 26, comprising a sample of young Spanish university students. The recruitment of participants was not guided by relationship status or orientation, as in other studies in the Spanish culture (e.g., Lecuona et al., 2021). Therefore, our sample, although small concerning CNM, is a quality sample, as it is not biased toward individuals in CNM movements or associations. Though it is not a representative sample of Spanish youth, it may reflect an approximate picture of the prevalence of CNM in Spanish youth in the university context (in our sample, 7.35% of those involved in a relationship). We acknowledge that this estimate cannot be generalized to the overall population.

We found no age differences between the groups. Compatible with prior literature, (e.g., Séguin et al., 2016), sexual minorities were more prevalent within the CNM group (67.80% vs. 24.60% in the monogamous group). However, CNM individuals did not present significant gender differences in our sample. This counters previous literature (e.g.,





**Fig. 1** Estimated means with TOST and NHST 95% confidence intervals for all self-report variables for monogamous and CNM practitioners. *Note* Bold lines represent TOST 90% confidence interval,

while narrow lines represent NHST 95% confidence interval; dotted black lines represent bounds set for 80% power

Hauptert et al., 2017), which proposed a higher presence of men in CNM relationships compared to monogamous relationships. However, our data suggest this is not the case. Moreover, as monogamy can be assumed to be the normative and most frequent relational style, our data suggest that CNM individuals do not differ in gender from this normative group. That is, gender does not seem to be a discriminating characteristic in CNM individuals, at least, not in young university students in Spain. Nevertheless, this should be taken with caution, as our sample is gender biased (76.83% women, 23.16% men). Though this study does not represent a prevalence study, this is a first approach to achieve a picture of CNM prevalence in individuals involved in a relationship in the young university population in the Spanish culture.

### Personality, Dark Personality, and Mating Orientations

Regarding personality, we expected to find slightly higher open-mindedness and lower conscientiousness, similar agreeableness, extraversion, and negative emotionality in CNM individuals than in their monogamous counterparts. In fact, CNM people do not show different scores on agreeableness. They also present similar scores in extraversion and negative emotionality, and slight differences in open-mindedness (CNM individuals were higher) and conscientiousness (CNM people were lower). Even though these differences are slight, results indicate the same direction as

previous evidence found regarding personality traits (Lecouona et al., 2021). Therefore, the results indeed show real, albeit not large, differences. It makes sense that being more open-minded somehow goes together with new ways of relating to others outside of the norms.

Prior evidence with individuals of sexual minorities (Moors et al., 2017) show that trait openness to experience predicted positive attitudes and greater desire to engage in CNM, whereas conscientiousness predicted negative attitudes and less willingness. Additionally, regarding conscientiousness, the lower scores presented in CNM individuals may be related to peripheral aspects associated with conscientiousness such as dutifulness and conventionality (e.g., DeYoung et al., 2007), as CNM people do not follow traditional relationship scripts.

We also explored dark personality in CNM and monogamous individuals. We did not expect CNM individuals to score higher than monogamous people in dark core personality. As expected, no differences were found regarding D between CNM and monogamous individuals. Both groups scored similarly in dark personality, indicating that CNM people are not more prone than monogamous ones to disregard, accept, or malevolently provoke disutility for others, or to being more dishonest, strategic in their relationships, self-centered, ruthless, non-empathetic, or callous. It is also noteworthy that D correlates positively with sociosexual attitudes and desire but only in monogamous individuals, and not in CNM people. However, this result should be taken with

caution, as the small sample size of the CNM group led to underpowered and non-significant differences.

Our hypotheses predicted we would find higher sociosexuality in CNM relationships in all three components (behavior, attitudes, and desire) when compared to monogamous individuals, which is in line with our results. However, considering CNM individuals' narrative, we did not expect higher D, and our results show that, in fact, CNM relationships do not present a higher D than monogamous individuals, nor do they present positive correlations between sociosexuality and D, as prior evidence shows for the general population (without considering relational status). Apparently, sociosexuality in CNM individuals does not relate to negative aspects of personality, which is in line with the explicit narrative about care in sexual/affective CNM relationships (e.g., Mogilski et al., 2020).

We highlight that the correlation between sociosexuality and dark traits reported in the literature (e.g., Fernandez del Río et al., 2019; Garcia, 2020; Moore et al., 2020) for general population (without differentiating CNM individuals) might support the stigma against CNM people. If prior evidence shows positive correlations between sociosexuality and dark traits in the general population, it is likely that many people have encountered sexually unrestricted individuals (high sociosexuality) who were more immoral, less trustworthy, and darker. Thus, the fact that CNM individuals may be more sexually unrestricted might make monogamous people expect that such individuals are likely to be more immoral, less trustworthy, and darker individuals. Again, that is why is important to point out that, according to our data, the positive correlation between sociosexuality and the dark core appears only in the monogamous group. Nevertheless, this result should be taken with caution, as further studies with larger samples should be conducted to replicate (or not) this difference.

Regarding sociosexuality, the data support our hypothesis and replicate prior literature (Mogilski et al., 2017; Morrison et al., 2013; Rodrigues et al., 2016b), with higher and relevant differences for attitudes and desire, but more moderate, but relevant, differences for actual sociosexual behavior. Perhaps, even though attitude and desire are higher in CNM individuals, the similar scores as those of monogamous people in sociosexual behavior may be related to the age of the sample (range from 18-26). We note that scores in this component are low (about 1.85 on a 1-to-9 Likert scale). Thus, potential group differences may be observed in older samples. Another possible explanation is the difficulties in achieving actual encounters (time as a finite resource, stigma against CNM people, mismatching styles, or other variables). In addition, possible floor effects could also bias our results, reducing potentially relevant differences between CNM and monogamous practitioners.

Regarding LMTO, as expected, CNM individuals score lower than monogamous individuals. However, no differences were found in the current relationship duration (around 22 months) between CNM and monogamous individuals, a duration that, considering the age range of the sample, is similar to previous findings in the general population (Murray & Milhausen, 2012). Prior evidence shows that CNM relationships could be as long-lasting as monogamous ones (Conley et al., 2017; Séguin et al., 2016). Therefore, it is plausible that LMTO does not apply to CNM individuals' thoughts about relationships and love in the long term. As mentioned, items from the LMTO present an idealized notion of romantic love, whereas CNM individuals have a critical view of this idea. Thus, it makes sense for CNM individuals to score lower than monogamous ones in this measure despite having a similar duration of current relationships. New measures designed from the romantic love narrative might be necessary to address this issue and overcome a possible method bias in the CNM population. In this line, it should be mentioned that Sakaluk et al. (2021) recommend testing for measurement invariance and equivalence in comparative research between CNM and mono-normative individuals.

Other aspects that should be considered to understand the differences in LMTO relationships between CNM and monogamous individuals are the levels of commitment and satisfaction, as well as different CNM configurations. For example, in the study of Mogilski et al. (2017), no differences were found in the satisfaction of monogamous and CNM individuals when they evaluated CNM individuals' primary relationship, but they found differences within CNM relationships in their satisfaction with and desirability of their secondary partners as a long-term mate. Other studies have indicated that intimacy, satisfaction, and commitment (core components of long-term relationships) might be as high or even higher in CNM individuals than in monogamous ones (Rodrigues et al., 2016a, 2016b, 2019).

The actual mono-normative context presents a relatively consistent set of negative claims (not only psychological) about how CNM individuals are different from monogamous individuals; differences that translate into discrimination, even concerning laws and rights (Pérez Navarro, 2017). Thus, any evidence contradicting any of these claims, for example, that CNM individuals are no different from monogamous individuals in positive (i.e., agreeableness) and negative (i.e., dark personality) personal characteristics, may contribute eradicating the stigma and dehumanization against CNM individuals if such evidence is used to inform and educate people.

## Limitations and Future Directions

Some limitations of the present study should be considered. Firstly, the generalization of our results to different

populations should be done cautiously; our sample is young, mainly female, and only from the university context. Thus, the same pattern of results might not apply to the general Spanish population or other cultures. Secondly, our study is based on self-report measures, which might bias the results. Thirdly, the relational status can change over time depending on the circumstances or even one's partner in a certain relationship. For example, someone initially monogamous whose partner identifies as a CNM individual may change or try a different relationship option, in the same line as commitment may vary according to the partner's commitment (e.g., Markey & Markey, 2013). In addition, the small subsamples of different types of CNM relationships did not allow us to differentiate in the analysis, which, with larger, high-powered samples and subgroups, could impact our results (e.g., Conley & Piemonte, 2021).

Likewise, a fifth limitation is not having differentiated monogamous practitioners from serial monogamous or cheating (i.e., non-consensual) monogamous practitioners. Cheating monogamous people may score higher in dark traits and change the results in this sense. Therefore, this should be addressed in future studies. In the same line, different forms of CNM (e.g., swinger, polyamory, etc.) might also generate some differences. Another limitation regards gender and sexual minorities. In this sense, our sample size has unrepresented groups, as we simplified gender heterogeneity (binary gender male/female) and sexual orientation (heterosexual/sexual minorities) in our main analysis.

Future research with larger and more representative samples, longitudinal and multilevel (dyads, triads, etc.) studies could solve these limitations. Nevertheless, we consider that our sample, although small in CNM individuals (59 out of 803), is a high-quality one. This is due to the recruitment method, which was not biased toward individuals in CNM movements or associations, but was recruited from the more diverse context of the University. Finally, another limitation of the present study regards the use of the same instruments without considering measurement invariance (Sakaluk et al., 2021). This might be a relevant case of what it is understood by CNM individuals and monogamous individuals regarding the LTMO instrument, as CNM individuals more likely reject the narrative of romantic love (Cubells-Serra et al., 2021). Future studies should explore the measurement invariance of instruments assessing relevant constructs (like LTMO). We also propose that future research should explore the long-term mating patterns of CNM individuals in depth as an interesting venue to explore the theoretical foundations of the construct. Longitudinal studies could add relevant evidence of the temporal dynamics of LTMO (or any other relevant construct) in CNM individuals.

## Conclusion

This study indicates that CNM individuals do not have special personalities. CNM individuals present similar scores in big five personality traits as monogamous ones, and they are not prone to higher dark personality traits than monogamous individuals. Although CNM people are prone to higher sociosexuality levels and lower levels of LTMO, the duration of current relationships is similar in CNM and monogamous individuals. All in all, CNM people seem to be more pro-sex than monogamous people and less committed to the romantic love narrative of the LTMO, but they are not more disagreeable, untrustworthy, self-centered, ruthless, or malevolent. Thus, this study provides psychological evidence of CNM people that could be used to eradicate their stigma and dehumanization.

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**Availability of Data and Materials** The open database and code files for these analyses are available at the Open Science Framework repository (<https://osf.io/3nxv4/>).

## Declarations

**Conflict of interest** The authors have no conflicts of interest to declare that are relevant to the content of this article. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

**Ethics Approval** Approval was obtained from the Ethics Review Board for Clinical Research of Aragón (PI18/058). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

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

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