STUDIA PSYCHOLOGICA
THEORIA ET PRAXIS

SPIS TREŚCI

IN NEGATIVE LIFE CONTEXTS MEN REPORT A LOWER DESIRE TO END RELATIONSHIP IF THEIR PARTNERS ARE HIGH IN BORDERLINE BEHAVIOURAL CHARACTERISTICS. A QUASIEXPERIMENTAL RESEARCH

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ABSTRACT

KEYWORDS

BORDERLINE PERSONALITY
MATING
LIFE HISTORY THEORY
EVOLUTIONARY PSYCHOPATHOLOGY

We investigated the relationship between borderline symptoms in women and their partner's desire to continue the relationship and relationship commitment in an aversive living environment using an experimental design. We aimed to highlight the adaptive mechanisms of borderline symptoms, which may materialize in reproductive advantages for women in aversive contexts. We conducted two experiments to test the same hypotheses. In Study 1, online participants were assigned to the experimental group (N = 123). The experimental scenario hypothesized having a relationship with a woman high in borderline characteristics, during an aversive life environment. The control group (N = 118) hypothesized having a relationship with a woman high in borderline characteristics, during normal living conditions. We repeated the same experimental manipulation using a within-subjects design in Study 2 (N = 171). Environmental conditions influenced the desire to end the relationship with women characterized by borderline symptoms; men had a lower desire to end the relationship with their partner in aversive life events than in normal living conditions. Thus, women's borderline behavioral characteristics may bring mating benefits in aversive living environments.

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W NEGATYWNYCH KONTEKSTACH ŻYCIOWYCH MĘŻCZYŹNI ZGŁASZAJĄ MNIEJSZĄ CHĘĆ ZAKOŃCZENIA ZWIĄZKU, JEŚLI ICH PARTNERZY MAJĄ WYSOKIE CECHY TYPU BORDERLINE. BADANIA QUASI-EKSPERYMENTALNE

ABSTRAKT

Zbadaliśmy związek między objawami borderline u kobiet a chęcią ich partnera do kontynuacji związku i zaangażowaniem w związek w awersyjnym środowisku życia za pomocą projektu eksperymentalnego. Naszym celem było podkreślenie mechanizmów adaptacyjnych objawów borderline, które mogą przejawiać się w korzyściach reprodukcyjnych dla kobiet w kontekstach awersyjnych. Przeprowadziliśmy dwa eksperymenty, aby przetestować te same hipotezy. W badaniu 1 uczestnicy online zostali przydzieleni do grupy eksperymentalnej (N = 123). Scenariusz eksperymentalny zakładał związek z kobietą o wysokich cechach borderline, w awersyjnym środowisku życiowym. Grupa kontrolna (N = 118) postawiła hipotezę o związku z kobietą o wysokich cechach borderline, w normalnych warunkach życia. W Badaniu 2 (N = 171) powtórzyliśmy tę samą manipulację eksperymentalną, stosując podejście grup naprzemiennych. Warunki środowiskowe wpłynęły na chęć zakończenia związku z kobietami charakteryzującymi się objawami borderline; mężczyźni wykazywali mniejszą chęć zakończenia związku z partnerem w awersyjnych wydarzeniach życiowych niż w normalnych warunkach życia. Zatem behawioralne cechy borderline kobiet mogą przynosić korzyści w łączeniu się w pary w awersyjnych środowiskach życia.

SŁOWA KLUCZOWE

osobowość borderline, teoria historii życia, psychopatologia ewolucyjna

Among all personality disorders, borderline personality disorder (BPD) may produce the most suffering and burden to individuals (Bouchard et al., 2009). BPD is characterized by a pattern of unstable and intense relationships, uncontrolled emotional reactions, and impulsivity (Sperry, 2016). Other symptoms include fear of abandonment, self-destructive behaviors and recurrent suicidal episodes, and a sense of inner emptiness (American Psychiatric Association, 2013). The American Psychiatric Association (2013) estimates that the prevalence of BPD to be between 1.6% and 5.9%. At least three-quarters of diagnosed patients attempt suicide, and 10% commit suicide (Black et al., 2004). The average number of suicide attempts is three, and the suicide rate is 400 times higher than in the general population (Oumaya et al., 2008). Women comprise about 75% of BPD diagnoses (American Psychiatric Association, 2013). Previous research focused on dysfunctional BPD symptoms in couples, highlighting low relationship satisfaction and emotional distress when one partner is diagnosed with BPD (Bouchard et al., 2009). Hill et al. (2011) also suggested that borderline symptoms are associated with dysfunctional romantic relationships. In this research, we investigate if the characteristics of BPD in women may offer them mating advantages in aversive life contexts: their partners should manifest a lower desire to end the relationship and higher relationship commitment in aversive living conditions compared to normal living conditions.

Like most psychopathologies, BPD is described and conceptualized as maladaptive. In psychology, other social sciences, and psychiatry, the term "adaptive" refers to behaviors and characteristics that contribute to health, quality of life, well-being, and functional social relations. "Maladaptive" is understood as socially undesirable or distressing (Del Giudice, 2014). However, the terms adaptive and maladaptive have different meanings in evolutionary biology. Regarding an individual organism, they refer to the fitness of that organism, which represents the transmission of its genes into the next generation (Buss, 2008). As such, adaptive traits maximize inclusive fitness, contributing to individual reproductive success in ancestral populations. Maladaptive traits impede the survival or reproductive success of the individual (West et al., 2007). Thus, the meanings of adaptive and maladaptive in biology are different from their use in the social sciences. This is mainly because natural selection targets reproductive success rather than well-being or happiness (Cosmides & Tooby, 1999). As such, characteristics that are adaptive from a biological perspective may be socially undesirable or may impede the individual's well-being. This is also valid for psychopathology, for which symptoms may be adaptive traits or behaviors (Del Giudice, 2014). Typical examples include impulsive, aggressive, and exploitative behaviors. Many disorders list such behaviors as symptoms, but they may facilitate survival and reproduction in certain environments and contexts, such as in resource-scarce environments. Being selfish, exploitative, and impulsive in such environments may afford the individual somatic or reproductive advantages. Many disorders or symptoms, such as psychopathy, narcissism, aggression, risk-taking, autism, schizotypal traits, internalizing and externalizing symptoms, and eating disorders have been investigated from an evolutionary perspective (Barr & Quinsey, 2004; Figueredo & Jacobs, 2010; Del Giudice et al., 2010).

BORDERLINE PERSONALITY FROM AN EVOLUTIONARY PERSPECTIVE

Drawing on the above, we test the hypothesis that BPD symptoms may be adaptive from an evolutionary perspective. We can understand the adaptive nature of BPD characteristics

from the perspective of Life History Theory (Figueredo et al., 2006). This middle-level evolutionary theory notes that the energy of an organism is limited, and tradeoffs are requisite in allocating resources and energy to important life challenges (Szepsenwol & Simpson, 2019). The theory proposes that the allocation of resources is performed on an r/K continuum in which one pole is represented by a fast strategy (r-selected traits), whereas the other pole is represented by a slow strategy (K-selected traits). The strategies aim to facilitate fitness (through tradeoffs) dependent on environmental conditions (Dunkel et al., 2011). Childhood environments characterized by harshness and unpredictability lead individuals to develop a fast life history strategy (e.g., early physical maturation, giving birth at a young age; Figueredo et al., 2004). The psychological or behavioral characteristics of individuals with a fast life history strategy are clustered around impulsivity and lowered empathy, and include orientation toward short-term gains and an opportunistic lifestyle, sexual variety, lower parental investment, disregard for social rules, lower social support, and extensive risk-taking (Figueredo et al., 2006).

BPD includes fast life history traits such as impulsivity, unstable attachments, risk-taking, promiscuous sexuality, anger, and aggressiveness (Brune et al., 2010; Brune, 2014, 2016), and childhood maltreatment (Ball & Links, 2009). From a life history perspective, individuals high in BPD symptoms may succeed in a harsh and unpredictable environment. For example, impulsivity and anger may lead to an exploitative and predatory interpersonal style and may help the individual gain access to resources in a scarce and competitive environment (Figueredo et al., 2006). Also, the feeling of emotional emptiness can lead the individual to take risky decisions that facilitate access to resources in a harsh environment. Therefore, harsh childhood environments shape the psychological mechanisms of individuals to adapt to such an environment during adulthood. Many of these mechanisms may be manifestations of BPD.

BORDERLINE BEHAVIORAL CHARACTERISTICS IN WOMEN AND PARTNER'S RELATIONSHIP COMMITMENT

The outcomes we focus on in the current research are related to mating and measured from the perspective of the partners of women with BPD behaviors: (1) continuing the relationship in aversive life contexts and (2) relationship commitment in aversive life contexts, both manifested by the partners of people with borderline behavioral characteristics. Given that women are more affected by BPD (American Psychiatric Association, 2013), we investigated men's desire to continue the relationship and their commitment in aversive life contexts if they are mated to women high in borderline symptoms.

The reasons we used these two behavioral indicators as mating advantages are as follows. Many couples decide to end the relationship when confronted with difficult living conditions and times (Zhu et al., 2021). By doing this, both partners must invest resources to attract a new mate, which may bring reproductive costs. Humans evolved mate retention strategies to prevent relationship defection and its costs (Buss & Shackelford, 1997). Behaviors that directly or indirectly encourage the partner to continue the relationship may be understood as mate retention strategies. These can range from benefit-provisioning behaviors, such as giving a partner gifts (which are lower-risk behaviors), to cost-inflicting behaviors, such as monopolizing a partner's time, which are higher-risk behaviors because they are more likely to drive away a partner (Buss, 1988).

We argue that many of the symptoms and characteristics of BPD in the case of women function as mate retention behaviors. We decided to consider only women for the behavioral prototype as borderline personality is mostly found in women (American Psychiatric

Association, 2013), which may lead to the idea that there are sex differences when it comes to the adaptiveness of bordeline traits. For example, in terms of mating and relationship functioning, it may be more adaptive for women to be needy than for men, considering the stereptype perception that emotionally unstable men are weak.

Among social perceptions, masculinity and the male gender are described as having three major components: toughness, poise, and responsibility (Doss & Hopkins, 1998). When confronted with a situation in which his partner – a woman high in BPD characteristics – gets through an aversive life context (e.g., losing her job, having an ill family member, a personal loss, etc.), a man is expected to show care and compassion to her and to manifest a combination of two components of masculinity: responsibility and toughness. As such, by caring and showing responsibility, he should decide to remain in the relationship with his partner. A woman high in borderline symptoms is gripped by a deep sadness that she cannot handle and is overwhelmed, often crying frequently; she has trouble enjoying the small pleasures in life, and she is often afraid she will be abandoned; in addition, she often reports discomfort and irritability and is prone to self-harming. In harsh life situations such as those mentioned above, women high in BPD characteristics tend to be overwhelmed and express these negative emotional states and thoughts and communicate to their partners that they cannot go through this alone. To comply with the social identity of masculinity, her partner may show responsibility and help her in this harsh situation and, consequently, continue the relationship with her.

Conversely, in normal and prosperous living conditions, the man should not be overwhelmed by her emotional and cognitive problems when the woman does not get through harsh life events. He may be dissatisfied with their relationship and decide to leave her. Therefore, we argue that the BPD symptoms in women may function as mate retention strategies in harsh living conditions, which include harsh environments that facilitated fast life history strategies (Figueredo et al., 2006).

To sum up, in this research we investigate if the characteristics of BPD in women may offer them mating advantages in harsh life contexts: their partners should manifest a lower desire to end the relationship and higher relationship commitment in aversive living conditions compared to normal living conditions. We developed a scenario in which men had to imagine that they were in a relationship with a woman high in BPD symptoms and then rate their intention to end the relationship in aversive living conditions and in normal living conditions. These scenarios are described next. In Study 1, we tested the hypotheses using a between-subjects design, whereas in Study 2, we used a within-subject design.

METHOD

PARTICIPANTS

We used *G*Power to determine the necessary sample size to obtain significant effect sizes. The minimum required sample size for effect size of .30, with alpha set at .95, and the statistical power set at .95 was 141 participants for each group. Participants were recruited online through a social media platform. We noted that only men at least 18 years old are eligible to participate. A convenience sample was used to comprise the experimental group, consisting of 123 participants, with an average age of 23.56 (SD = 7.84). The control group was comprised of 118 participants, with an average age of 23.48 (SD = 6.89). The initial group consisted of 135 responses in the experimental group, but 11 females and one 17-year-old male participant were excluded from the data analysis. The initial control group consisted of 120 participants; two women were excluded from the control group.

In the experimental group, 49.6% of respondents indicated that they are not in a romantic relationship, and 50.4% indicated that they are in a relationship. Among the participants in a relationship, 37.1% had a relationship of less than one year, 29.0% between 1 and 3 years, 14.4% between 3 and 5 years, and 19.4% over 5 years. In the control group, 39% of participants indicated that they are not in a romantic relationship, whereas 61% indicated that they are in a relationship. Of the latter, two respondents did not mention the duration of the relationship, 36.1% had a relationship of less than one year, 26.4% between 1 and 3 years, 15.3% between 3 and 5 years, and 19.4% over 5 years.

For study 2, we used *G**Power to determine the necessary sample size to obtain significant effect sizes. The minimum required sample size for effect size of .30, with alpha set at .95, and the statistical power set at .95 was 45 participants. As in Study 1, participants were recruited online through a social media platform. It was mentioned that only men at least 18 years old are eligible to participate. A convenience sample was used, resulting in 171 participants, with an average age of 23.62 (SD = 4.54), of which 66.7% were in a relationship. Among the participants who reported that they were in a relationship, 22.6% were in the relationship for less than a year, 28.6% between one and 3 years, 8.9% between 3 and 5 years, and 6.5% longer than 5 years. The data of this reserach is available on Open Science Framework: https://osf.io/um9qb/

DESIGN AND PROCEDURE

We created two independent forms that contained the scenarios and the measures to be used in this quasi-experimental design—one for the experimental group and one for the control group. In the first form, we included the experimental condition, which asked participants to imagine that they are in a relationship with a woman that thinks, feels, and behaves specifically as a person with borderline personality symptoms. To create the borderline prototype, we used the behavioral anchors mentioned as diagnostic criteria in DSM-V (American Psychiatric Association, 2013; e.g., She is often afraid that she will be abandoned).

Considering this description, participants were presented a harsh life context that their partner must deal with right now. In these circumstances, they were asked to rate to what extent they intend to leave her and their relationship commitment (1 = *totally disagree;* 5 = *totally agree*). The scenarios presented to the participants can be found in Appendix 1.

In the second form, we included the control condition, which asked participants to imagine that they are in a relationship with a woman that thinks, feels, and behaves specifically as a person with borderline personality symptoms (as in the case of the experimental condition). After presenting the behavioral prototype, they were asked the degree they intend to leave her and to rate their relationship commitment (1 = *totally disagree*; 5 = *totally agree*). The behavioral borderline prototype was the same as in the experimental condition. The main difference was that in the control condition the harsh life context was absent.

We presented the behavioral prototype description to a group of psychology undergraduates who were asked to rate how representative that description is for a person with a borderline personality disorder on a rating scale from 1 to 10 (1 = *a very weak description*; 10 = a very good description). The behavioral description of the borderline prototype was perceived as a good description of the borderline personality prototype (N =31, M = 8.53, SD = 1.65).

We presented the harsh living context to a group of undergraduates. We asked them to rate how representative that description of a harsh life context is on a rating scale from 1 to 10 (1 = *a very weak description*; 10 = *a very good description*). The description was perceived as a good description of an aversive living context (N =31 = M = 8.00, SD = 1.67).

In study 2, we constructed an online form that contained the scenarios and the measures to be used in this within-subject experimental design. We used the same scenarios and instruments as in Study 1. The only difference was that here we used a repeated-measures design. To control as much as possible the order and learning effect, we counterbalanced the participants. Half of them started the study with Condition B (stable environment) and half of them with Condition A (harsh environment). The participants were initially induced in Condition A, where they had to imagine that they were in a relationship with a woman that thinks, feels, and behaves specifically as a person with borderline personality symptoms. To create the borderline prototype, we used the behavioral anchors diagnostic criteria in DSM-V (American Psychiatric Association, 2013; e.g., She is often afraid that she will be abandoned). Considering this description, participants were presented a harsh life context that their partner must deal with right now. In these circumstances, they were asked to rate the extent to which they expected to end the relationship and their relationship commitment.

Condition B asked participants to imagine that they are in a relationship with a woman that thinks, feels, and behaves specifically as a person with borderline personality symptoms (as in the case of the experimental condition). After presenting the behavioral prototype, they were asked to rate the extent to which they expected to end the relationship and their relationship commitment without the harsh life context.

MEASURES

Relationship commitment was measured with the Triangular Love Scale - Commitment (Sternberg, 1997), containing 12 items scored on a 5-point Likert scale (1 = not characterizing me, 5 = characterizing me very much). For this scale, examples of items are: "I always feel a responsibility for my partner," "I am determined to continue the relationship with my partner." The score is calculated by summing responses to the items. The internal consistency coefficient was .92 for the control group and .92 for the experimental group. Participants from both groups responded, on a scale of 1 to 5, where 1 = I am not thinking of leaving her and 5 = I am very often thinking of leaving her, the degree to which they expected to end the relationship with the partner. It was also mentioned that the participants must relate to the potential relationship with the partner described above in the scenarios. Therefore, with these scenarios, we manipulated life conditions. In the experimental condition, a harsh life context was described, whereas there was no harsh life context described for the control group. In study 2 the measures were the same as in study 1.

RESULTS

In study 1, life conditions influenced men's expectation to end the relationship with women characterized by borderline symptoms, the model being significant with $F(1,237) = 10.52$, $p = .001$ such that men reported a lower desire to end the relationship with their partner in harsh life events than in normal living conditions. As such, the research hypothesis was partially supported by the data. Further, the environmental conditions did not influence the expected commitment to the relationship with a partner characterized by borderline symptoms, the model not being statistically significant with $F(1,237) = .64$, $p = .42$. Table 1 presents the means, standard deviations, and t-values for independent samples t-tests for the desire to end the relationship and relationship commitment in the experimental and control conditions.

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https://doi.org/10.21697/sp.2022.22.2.01

In study 2. we tested the same hypothesis in a within-subject experimental design to overcome some of the limitations of a quasi-experimental design (e.g., lack of randomization and the presence of confounding variables). As expected, the desire to end the relationship in harsh conditions was strongly related to desire to end the relationship in normal living conditions ($r = .71$, $p = .001$). The desire to end the relationship was negatively related to relationship commitment in harsh ($r = -.54$, $p = .001$ and normal conditions ($r = -.48$, $p = .001$). Also, the desire to end the relationship in normal conditions was negatively associated with relationship commitment in harsh ($r = -.49$, $p = .001$) and normal conditions ($r = -.57$, $p = .001$). Relationship commitment in harsh conditions was strongly related to relationship commitment in normal living conditions ($r = .80$, $p = .001$). Tables 3 presents the means, standard deviations, and t-values for dependent samples t-tests for the desire to end the relationship and relationship commitment.

Environmental conditions influenced the desire to end the relationship with women characterized by borderline symptoms, the model being significant with [$F(1, 170) = 6.13$, $p<.05$, $\eta p^2 = .04$], such that men reported a lower desire to end the relationship with their partner in harsh life events than in normal living conditions. As such, the research hypothesis was partially supported by the data. Further, the environmental conditions did not influence relationship commitment with a partner characterized by borderline symptoms, the model not being statistically significant, with [$F(1, 170) = 0.14$ $p > .05$, $\eta p^2 < .01$].

Using a within-subject experimental design, we found that men intend less to end the relationship with a woman with borderline behavioral characteristics in harsh life conditions, compared to normal living conditions. Relationship commitment did not differ in the two experimental conditions. These findings are similar to those reported for Study 1, increasing the internal validity of the research. This partially supports the hypothesis that borderline behavioral characteristics may represent adaptations that afford mating advantages for women.

DISCUSSION

This research aimed to test if women with borderline behavioral characteristics have a mating advantage because their partners do not end the relationship when they experience aversive life events, and also are more committed to the relationship. Study 1 and Study 2 findings suggested that in aversive living conditions, a man will be more likely to remain in a relationship with a woman characterized by symptoms of borderline personality disorder, choosing not to leave her.

Previous research showed that borderline symptoms are linked with negative outcomes in couples, such as low relationship satisfaction and high emotional distress (Blanchard et al., 2021; Bouchard et al., 2009). Consequently, from what we know, our research is among the few that have tested if borderline behavioral characteristics may be understood from an adaptive and evolutionary perspective and if there are mating benefits for women affected by these symptoms.

We found that when men imagined they were mated to a woman with borderline behavioral characteristics who experienced a aversive life context, the desire to end the relationship was lower than in the control condition. Our findings extend prior research. For example, Brüne et al. (2010) sought to identify whether BPD, framed as a fast life strategy, described a mating strategy with adaptive benefits. Their findings indicated that in unsafe living environments, women characterized by borderline symptoms have a competitive advantage in mating, being more attractive to men. They showed that BPD could be considered an evolutionary mating strategy, going beyond the costs involved and analyzing the benefits that women can use to facilitate reproduction in unstable environments.

A possible explanation of the fact that in aversive living conditions a man is more likely to remain in a relationship with a woman characterized by symptoms of borderline personality disorder, choosing not to leave her, is that a man when confronted with a situation when his partner – a woman high in BPD characteristics – gets through an aversive life context would show caring and compassion to her and manifest a combination of three major components of masculinity: responsibility, poise, and toughness. Consequently, as we expected, some of the BPD behavioral characteristics may be understood as mate retention behaviors in the case of women, as they help them remain in a relationship in hard times. This finding is another indicator that the symptoms of BPD may be understood as manifestations of a fast life history strategy (Del Giudice et al., 2014), as they might be adaptive only in aversive and harsh life contexts.

Men did not rate their relationship commitment differently in harsh and normal living conditions. This may be explained by the fact that commitment is built on communication and emotional and attitudinal bonding (Sternberg, 1986). Individuals with borderline behavioral characteristics manifest an aggressive communication style and unstable emotional reactions (Sperry, 1986). Therefore, men mated to women with borderline symptoms may find it hard to develop their relationship commitment because of such emotional and communication incongruencies.

Our research has theoretical implications for evolutionary psychopathology. We highlighted potential mating benefits of borderline symptoms, supporting the idea that personality disorders favored, to some degree, survival or reproduction of the individuals characterized by them (Del Giudice, 2014). This can be supported by the fact that the specific symptoms of certain disorders have not disappeared over time, but have continued to appear, favoring adaptation and survival in certain situations, such as in unsafe living environments, in which women with these symptoms enjoy mating benefits, as, for example, in a couple's relationship, the borderline symptoms of women may facilitate greater responsibility by men, who choose not to leave their partners.

Even if we discussed BPD symptoms as adaptive, readers should not understand that we argue that personality disorders or other disorders are desirable and beneficial. In this regard, it is important to distinguish between the adaptive nature of characteristics, averaged across all the individuals who possess them, and how adaptive it is for a particular individual. In some situations, a characteristic may be selected even if most of the individuals that possess it suffer (Frankenhuis & Del Giudice, 2012). In this regard, the rewards of the few balance these potential costs. Moreover, symptoms characteristic of psychiatric disorders—but not necessarily the disorder itself--may represent adaptive strategies. Even if only some characteristics of a disorder are adaptive, the disorder may be retained in the population due to extreme variation in gene combinations (Del Giudice et al., 2014).

LIMITATIONS AND CONCLUSIONS

Even if this is the first experimental research that investigated the adaptive nature of women's BPD symptoms in mating contexts, it has limitations. First, we relied on convenience samples, which could affect the generalizability of the findings (Simons et al., 2017). Second, a between-subject experimental design with no randomization may involve individual differences that represent confounding variables that affect causality. Third, we relied only on reports of young men that may not have sufficient mating experience, which may alter how men would behave in real-life mating situations. Fourth, we used scenario-induced manipulation, in which participants had to imagine they are in a relationship with women characterized by borderline behavioral characteristics, which may lead to different judgments in terms of desire to end the relationship and commitment compared to real-life mating

experiences. Future studies should control for individual differences in participants and use randomization and a more balanced sample in terms of participant age.

From what we know, this is among the few studies that try to understand borderline personality from an evolutionary perspective. We showed that in aversive living conditions, a man is more likely to remain in a relationship with a woman characterized by symptoms of BPD disorder, choosing not to leave her. As such, some of the BPD behavioral characteristics may be understood as mate retention behaviors in the case of women, as they help them remain in a relationship in hard times.

Table 1. Mean, standard deviations, and t-values for independent samples t test for the desire to end the relationship and relationship commitment (Study 1 and 2)

Dependent variables	Aversive conditions (Exprimental group)	Stable environment (control group/post-test)	t	d
	M (SD)	M (SD)		
Desire to end the relationship (study 1)	2.06 (1.22)	2.59 (1.32)	-3.24**	0.41
Desire to end the relationship (study 2)	2.20 (1.21)	2.38 (1.25)	-2.51**	0.14
Relationship commitment (study 1)	3.54 (0.91)	3.65 (0.88)	-0.93	0.12
Relationship commitment (study 2)	3.62 (0.83)	3.64 (0.82)	-0.36	0.02

** = $p < .01$

Table 2. Correlations between all study variables (study 1)

Variable	1	2	3	4
1. Desire to end the relationship (aversive conditions)	-			
2. Desire to end the relationship (positive conditions)	.71**	-		
3. Commitment (aversive)	-.54**	-.49**	-	
4. Commitment (normal conditions)	-.48**	-.57**	.80**	-

** = $p < .01$

APPENDIX

The scenarios used to manipulate harsh life events in study 1 and study 2.

Imagine that you are in a relationship with a partner characterized by the following: She is often gripped by a deep sadness that she cannot handle and is overwhelmed by crying. She feels tense and panicked. She has trouble enjoying life's little pleasures; she says she can't feel anything. She is often afraid that she will be abandoned. She often reports discomfort and irritability. She has difficulty finding herself; she often says she doesn't know herself, she doesn't know who she really is. She is impulsive and prone to various addictions and addictions (e.g., alcohol, tobacco addiction, etc.). It is very difficult for her to manage her strong emotions, such as anger. She experiences inter–personal relationships very passionately and intensely, but she can oscillate in the way she relates to her partner (to you), she can idolize you, and on another day, she will resent you or criticize you for things. She often thinks of committing suicide.

Your partner is currently going through a very difficult time professionally, having problems at work due to a very high volume of work she has been facing lately and due to an authoritarian boss. She also recently received news from her doctor that she is facing some health problems. This news overwhelmed her, as she was already emotionally affected due to her mother's serious

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health condition. Given the context described above, respond on a scale of 1 to 5 (1 = I don't think about leaving her at all and 5 = I think about leaving her very often) the degree to which you plan to leave her (ending the relationship).

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WOMEN, SOCIAL MEDIA, AND PHYSICAL APPEARANCE ANXIETY: THE EFFECT OF SOCIOCULTURAL ATTITUDES

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ABSTRACT

In this report, we tested if viewing the body as an object (BAO; two forms: thin and curvaceous) and body as a process (BAP) on social media, and sociocultural attitudes regarding social media, directly affected women's state physical appearance anxiety. Women (N = 249; Mage = 23.81; SD = 5.68) completed an online experiment where they were randomly assigned to view BAO-thin, BAO-curvaceous, and BAP images. Viewing BAO-curvaceous images had no effect on women's state physical appearance anxiety. However, viewing BAO-thin and BAP images decreased women's state physical appearance anxiety. Further, this effect was stronger for women with greater internalization and awareness of body ideals conveyed by social media (i.e., high sociocultural attitudes). We conclude that sociocultural attitudes regarding social media may buffer the adverse effects of viewing BAO-thin images.

KEYWORDS

BODY IMAGE
SOCIOCULTURAL ATTITUDES
SOCIAL MEDIA
BODY AS A PROCESS
BODY AS AN OBJECT

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KOBIETY, MEDIA SPOŁECZNOŚCIOWE I LĘK DOTYCZĄCY WYGLĄDU: WPŁYW POSTAW SPOŁECZNO-KULTUROWYCH

ABSTRAKT

W niniejszym raporcie sprawdziliśmy, czy postrzeganie ciała jako przedmiotu (BAO; dwie formy: szczupła i zaokrąglona) i ciała jako procesu (BAP) w mediach społecznościowych oraz społeczno-kulturowe postawy wobec mediów społecznościowych bezpośrednio wpływają na stan lęku przed wyglądem fizycznym kobiet. Kobiety (N = 249; Mage = 23,81; SD = 5,68) ukończyły eksperyment online, w którym zostały losowo przydzielone do przeglądania obrazów szczupłych i zaokrąglonych, oraz obrazów ciała jako procesu. Oglądanie zaokrąglonych obrazów ciała nie miało wpływu na stan lęku przed wyglądem fizycznym kobiet. Jednak oglądanie obrazów szczupłych oraz obrazów ciała jako procesu miało negatywny wpływ na stan lęku przed wyglądem fizycznym kobiet. Co więcej, ten negatywny efekt był wyższy w przypadku kobiet o wysokich postawach społeczno-kulturowych. Wnioskujemy, że postawy społeczno-kulturowe dotyczące mediów społecznościowych mogą buforować negatywny wpływ oglądania obrazów szczupłych i obrazów ciała jako procesu.

SŁOWA KLUCZOWE

obraz ciała, postawy społeczno-kulturowe, media społecznościowe, ciało jako proces, ciało jako przedmiot

The thin-ideal has largely dominated portrayals of women's bodies (cite). However, alternative presentations, including strength-focused imagery and curvaceous imagery (cite), are growing in popularity - particularly on social media (cite). According to body conceptualization theory (Franzoi, 1995) a woman's body can be presented in two ways: Body as an Object (BAO) and Body as a Process (BAP; Mask et al., 2014; Mulgrew & Hennes, 2014). Images that highlight and objectify women's body parts (i.e., waist, legs) invite the viewer to focus on the model's external attributes, thus viewing the BAO. Comparatively, BAP presentation focuses on functional aspects of the body, emphasising instrumentality and functioning of muscles and strength.

Two common forms of BAO imagery on social media are thinspiration[1] which focus on thin bodies and body positive imagery which typically include diverse (e.g., overweight, curvaceous) body-sizes (Cohen et al., 2019). Although viewing thinspiration on social media has typically been associated with increased body dissatisfaction and eating disorders (e.g., cite), outcomes of viewing body positive imagery are mixed. Viewing positive body imagery can increase body satisfaction viewing body positive imagery can increase body satisfaction (Stevens & Griffiths, 2020) and lead women to make more positive statements about their appearance (Cohen et al., 2019). However, body positive images have also been shown to have no effect on women's body appreciation, esteem (Betz & Ramsey, 2017), and satisfaction (Tiggemann et al., 2020). In this brief report, we explore these nuances of BAO by testing the impact of BAO-thin images compared to BAO-curvaceous images.

Viewing BAP images can also have mixed impact; although some researchers note that focusing on the functionality of a body can have positive outcomes for body image (Abbott & Barber, 2010), exposure to BAP images can lower state appearance satisfaction (Mulgrew & Tiggemann, 2015) and increase negative (i.e., anxiety, depression) mood (Tiggemann & Zaccardo, 2015). On social media, BAP images have colloquially been termed fitspiration[2] (Deighton-Smith & Bell, 2018). Interestingly, women engage in more appearance comparisons after viewing fitspiration compared to thinspiration (Dignard & Jarry, 2021; Mulgrew & Tiggemann, 2015). As such, focusing on the BAP, particularly when the bodies still conform to society's conceptions of an ideal weight, may still have a deleterious effect on women's body-image.

In sum, there is inconsistency regarding the impact of BAO and BAP images, with both appearing to have positive and negative effects on women's body image. One possibility for this inconsistency could be individual differences in women's sociocultural attitudes. Sociocultural attitudes, which include internalization, perceived pressures, and awareness of ideals, are important determinants of women's body image (Cafri et al., 2005). Women who internalize the thin-ideal experience greater weight-related body anxiety, especially when exposed to thin models compared to average weight models, and less body appreciation after viewing body positive captions on thin images (Dittmar et al., 2009; Halliwell & Dittmar, 2004; Tiggemann et al., 2020). Meanwhile, women with low thin-ideal internalization experience less negative impact following exposure to attractive and thin models (Yamamiya et al., 2005).

Sociocultural attitudes have largely been assessed in relation to effects of traditional forms of media, such as television and magazines (Cafri et al., 2005). Compared to these traditional forms of media, social media is considered to have stronger influence on women's body image (Cohen & Blaszczynski, 2015). New trends in body presentation, such as fitspiration, are largely delivered via social media (Rounds & Stutts, 2021). Based on the important

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[1]   A portmanteau of thin and inspiration
[2]   A portmanteau of fit and inspiration

relationship between attitudes and body image (Monteath & McCabe, 1997), and between social media and body image (Ryding & Kuss, 2020), we explore, for the first time, the effect of women's sociocultural attitudes regarding social media on their state physical appearance anxiety levels.

The aim of this brief study is to explore if women's exposure to different body presentations (BAO-thin, BAO-curvaceous, and BAP) and their sociocultural attitudes regarding social media directly affect their state physical appearance anxiety. We predicted that women who viewed BAO-thin and BAP imagery would have increased state physical appearance anxiety post-image viewing. As per Dittmar and Howard (2004) and Stevens and Griffiths (2020), we predicted that women viewing BAO-curvaceous images have decreased state physical appearance anxiety post-image viewing. Lastly, we predicted that women with who were more likely to internalize body ideals via social media, experience perceived body idea pressure via social media, and have greater awareness of body ideals via social media (i.e., high sociocultural attitudes regarding social media) would have the most state physical appearance anxiety post-image viewing in all conditions.

METHOD

PARTICIPANTS AND PROCEDURE

Participants were 261 volunteer women aged between 18 and 66 years (M_{age} = 25.17 years; SD = 8.30) who indicated they were mostly Caucasian (73.2%). After receiving institution ethical approval from Federation University Australia (A16-054), potential participants were recruited via advertisements on social media (e.g., Facebook, Instagram). Prior to commencing the anonymous questionnaire, participants provided informed consent. Participation took approximately 20 minutes. An *a priori* power calculation indicated that with power set at .95, effect size at .25, and alpha at .05, a sample size of 251 was required and thus met. Data and materials are available via OSF.[3]

MEASURES

We measured physical appearance state and trait anxiety with the eight weight-related items from the *Physical Appearance State and Trait Anxiety Scale* (Reed et al., 1991). For trait anxiety, participants indicated how anxious, tense, or nervous they felt, *in general*, about the eight items (e.g., their weight, thighs, and buttocks). Responses were recorded on a 5-point Likert scale ranging from 1 (*Never*) to 5 (*Always*) and summed for an overall score of trait anxiety (Cronbach's α = .86). For state anxiety, participants indicated how anxious, tense, or nervous they felt *right now* (i.e., at this very moment) about the above characteristics. Responses were recorded on a 5-point Likert scale ranging from 1 (*Not at all*) to 5 (*Exceptionally so*) and summed for total pre-image presentation (α = .86) and post-image presentation (α = .93).

To assess sociocultural attitudes regarding social media, we modified the *Sociocultural Attitudes Towards Appearance Measure-3* (Thompson et al., 2004) by substituting the terms 'TV and magazines' to read 'social media'. Participants responded to items (e.g., "I've felt pressure from social media to lose weight"; current α = .96) on a 5-point Likert scale ranging from 1 (*Definitely Disagree*) to 5 (*Definitely Agree*) and summed for an overall score. Following procedure of Yamamiya et al. (2005), a median split was conducted to categorize women's sociocultural attitudes as low (48.7%) or high (51.3%).

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3   https://osf.io/9mq5c/?view_only=4cb3ac4b94ff4e9c81919012c22e026d

VISUAL STIMULI

We sourced the BAO-thin and BAP images from Mulgrew and Hennes (2014) and edited these images to appear as social media posts.[4] BAO-curvaceous images online from online public domains and edited to appear social media posts. We assessed the three categories of images (BAO-thin, BAP, and BAO-curvaceous) via manipulation checks, where participants (N = 292) indicated whether the image represented a thin, curvy, athletic, or obese body type. Only one image did not satisfy manipulation checks (73.4% indicated the body was "thin"). In total, there were eight images per category, and participants were randomly assigned to the three image categories: BAO-thin (32.6%), BAO-curvaceous (34.5%), and BAP (33.0%). Images were sequentially presented on the screen for a total of 30 seconds per image.

DESIGN

This study was an experiment administered via an online questionnaire. The design was a 3 × 2 × 2 mixed models experimental design with three Independent Variables: Image (3 levels: BAO-thin, BAO-curvaceous, and BAP; between subjects), time (2 levels: Pre-image presentation and post-image presentation; within-subjects), and sociocultural attitudes (2 levels: low and high; between-subjects). State physical appearance anxiety was the Dependent Variable. Trait physical appearance anxiety was included as a covariate.

RESULTS

All analyses[5] were conducted using SPSS v.27. Descriptives statistics can be seen in Table 1. A 3 × 2 × 2 mixed models ANCOVA was conducted, and a summary of results can be found in Table 2. For the interaction[6] of time and image, simple effects (Bonferroni-corrected) showed that women who viewed BAP images had more state physical appearance anxiety post-image (M = 23.38, SE = 0.58) viewing compared to pre-image (M = 20.97, SE = 0.54) viewing (p = .001). Further, women who viewed BAO-thin images had more state physical appearance anxiety post-image (M = 21.92, SE = 0.58) viewing compared to pre-image (M = 20.05, SE = 0.55) viewing (p = .001). There was no difference in pre- and post-state physical appearance anxiety for women who viewed BAO-curvaceous images.

For the three-way interaction (see Figure 1), women with stronger sociocultural attitudes had more state appearance anxiety post-BAP image (M = 25.46, SE = 0.86) viewing compared to pre-BAP image (M = 21.71, SE = 0.80) viewing (p = .001). This effect was also observed for women with weaker sociocultural attitudes post-BAP image (M = 21.30, SE = 0.82) viewing compared to pre-image (M = 20.22, SE = 0.77) viewing (p = .028). Lastly, women with stronger sociocultural attitudes regarding social media had more state appearance anxiety post-BAO-thin image viewing (M = 23.98, SE = 0.82) compared to pre-BAO-thin image (M = 20.60, SE = 0.78) viewing (p = .001). No other effect reached significance when correcting for Type 1 error inflation.

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4   Examples of these images can be requested from the corresponding author
5   Tests of normality indicated the state appearance anxiety distribution violated normality for each type of image (p > .05). Standardized skew and kurtosis statistics indicated no significant violations. All other assumptions were met.
6   In the interest of brevity, we only report the interactions in text. A full description of results can be requested from the corresponding author

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DISCUSSION

The aim of this study was to explore if women's exposure to different body presentations (i.e., BAO-thin, BAO-curvaceous, and BAP) and their sociocultural attitudes regarding social media would affect their state physical appearance anxiety. Results supported the hypothesis that viewing BAO-thin and BAP imagery would increase women's state physical appearance anxiety levels. These results corroborate findings that viewing BAO-thin (i.e., thinspiration) social media images can have a negative impact on body satisfaction (e.g., Anixiadis et al., 2019), and can increase weight-related body anxiety (Harper & Tiggemann, 2008). Further, these findings substantiate claims that despite a focus on function instead of objectification, viewing the BAP can still have a deleterious effect on state physical appearance satisfaction (Mulgrew & Tiggemann, 2015).

We also predicted that viewing BAO-curvaceous images would decrease state physical appearance anxiety levels post-image presentation, but this hypothesis was not supported. Viewing BAO-curvaceous images did not change state physical appearance anxiety as previously reported elsewhere (Betz & Ramsey, 2017; Tiggemann et al., 2020), but inconsistent with other work (Stevens & Griffiths, 2020). Before abandoning the body positivity movement though, it is important to note that although state physical appearance anxiety did not change after viewing BAO-curvaceous images, unlike BAO-thin and BAP conditions, it did not get any worse. Viewing more diverse bodies may not necessarily have positive effects on women's body satisfaction and appearance anxiety, but it does not appear to cause harm. It appears that viewing more diverse, female bodies may even be a neutral affective experience – information that will no doubt be important for body positivity activists.

Lastly, we predicted that stronger sociocultural attitudes regarding social media would increase state physical appearance anxiety in all post-image viewing conditions and results partially supported this hypothesis. Women who viewed BAO-thin images, and who internalize the thin body ideal via social media, perceive body pressure via social media, and have greater awareness of body ideals via social media (i.e., women high sociocultural social media attitudes), had more state physical appearance post-image viewing. This result corroborates previous findings that internalization (a component of sociocultural attitudes) of the thin-ideal is associated with increased body anxiety (Dittmar et al., 2009; Halliwell & Dittmar, 2004) and lower body appreciation (Tiggemann et al., 2020) when exposed to thin models. Interestingly, regardless of whether they had low or high sociocultural attitudes regarding social media, women who viewed BAP images experienced an increase in state physical appearance anxiety. As the current study is the first to explore body presentation, sociocultural attitudes regarding social media, and women's state physical appearance anxiety levels, interpretation of this finding is somewhat speculative. Still, we suggest that this finding supports the premise that fitspiration images could be even more damaging than thinspiration (Dignard & Jarry, 2021; Mulgrew & Tiggemann, 2015), and even more problematic, sociocultural attitudes regarding social media do not buffer this effect. Interestingly, it appears that sociocultural attitudes regarding social media only effect state anxiety when viewing BAO-thin and BAP images. State anxiety experienced after viewing BAO images of more diverse bodies (e.g., curvaceous) appears unaffected by these attitudes. As such, it is it is possible this effect is only observed when women view stereotypical body "ideals" (e.g., thin and athletic bodies; Baceviciene & Jankauskiene, 2021).

LIMITATIONS AND CONCLUSIONS

While there are several important implications to this study, there are some limitations to note. The sample was mostly Caucasian women in Australian (71.9%) aged 18 – 40 years. Although we selected body image images to reflect the sample, future research could test the generalizability of these results by exploring more diverse groups. The assessment of weight-related state physical appearance anxiety via self-report may also be subject to bias (Furnham & Henderson, 1982), and future research should consider employing more objective methods of state appearance anxiety, such as physiological responses. Lastly, although the images included in the BAO-curvaceous category underwent a manipulation check, they were not initially qualified and piloted to ensure construct validity.

Another limitation of the current study is that the sample only comprised women. Although we aimed to study only women, we acknowledge that viewing images on social media may also be deleterious to men's body image (Gültzow et al., 2020). We recommend future researchers endeavour to explore the effect of men's internalization of body ideals via social media, perceived ideals via social media, and awareness of body ideals via social media (i.e., sociocultural attitudes regarding social media), and how such attitudes effects their own state physical appearance anxiety when viewing social media images.

In conclusion, the presentation of diverse bodies on social media does not appear have an adverse effect on women's state physical appearance anxiety. As such, there is opportunity for future research to continue exploring body positivity images on social media in the quest to determine how body positive images may benefit women's body image. Further, although the goal of fitspiration may be to inspire women to engage in an active and healthy lifestyle, it could have more of a deleterious effect on women's body image than thinspiration (see Dignard & Jarry, 2021, for further discussion). Creators of social media content intended to enhance women's body image would benefit from understanding the potential harmful impact of fitspiration. Lastly, our findings show that sociocultural attitudes regarding social media may exacerbate the effect social media images have on women's state physical appearance anxiety – particularly for women viewing thin-ideals. This has important implications for psychosocial education on social media and body image and we recommend such education focus on internalization, perceived pressures, and awareness of ideals via social media.

Table 1. Descriptive Statistics and Effects for State Physical Appearance Anxiety Across Type of Images, Sociocultural Attitudes, and Time 1 and Time 2

		M (SD)		t	d
		Time 1	Time 2		
BAO-thin					
Low		16.78 (7.73)	17.08 (8.27)	-0.66	-0.11
High		22.21 (8.16)	25.79 (9.28)	-5.84*	-0.90
	t	-3.10*	-4.48*		
	d	-0.68	-0.99		
BAO-curvaceous					
Low		15.14 (7.00)	15.28 (7.10)	-0.40	-0.07
High		23.80 (8.82)	24.73 (8.84)	-1.80	-0.26
	t	-4.87*	-5.28*		
	d	1.07	1.16		
BAP					
Low		17.19 (7.82)	18.19 (7.93)	-2.78*	-0.42
High		24.56 (8.00)	28.49 (8.16)	-6.47*	-1.04
	t	-4.22*	-5.80*		
	d	0.93	1.28		

Note. BAO = Body as Object; BAP = Body as process, *d* is Cohen's *d* for effect size

*$p < .01$
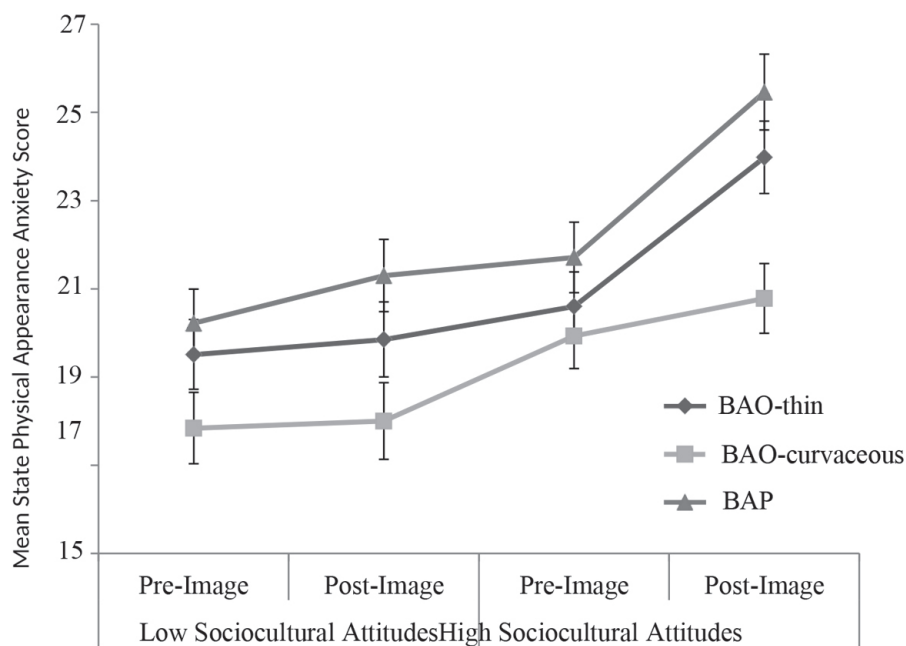
Figure 1. Interaction of individual sociocultural attitudes (low and high), type of image presented (BAO-thin, BAO-curvaceous, and BAP), and pre-and post-image mean state appearance anxiety scores

Note. Y-axis starts at 15, error bars represent Standard Error.

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WHY PEOPLE PREFER TO BE SINGLE: VOLUNTARY SINGLEHOOD AND EXPERIENCES WITH RELATIONSHIPS

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ABSTRACT

Not having an intimate partner is a common state in contemporary post-industrial societies. A substantial proportion of singles are voluntarily so that is, they prefer not to be in an intimate relationship. The current study aimed to examine whether past relationship experiences predicted voluntary singlehood. More specifically, using a sample of 629 Greek-speaking participants, we found that most voluntarily singles had other priorities, followed by those who had been disappointed by intimate relationships. We also found that, more negative past experiences with relationships, were associated with an increased probability to fall in the latter group than in the other groups of voluntary singlehood or being mated.

KEYWORDS

SINGLEHOOD
VOLUNTARY SINGLEHOOD
PAST EXPERIENCES WITH RELATIONSHIPS
MATING

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DLACZEGO LUDZIE WOLĄ BYĆ SINGLAMI: BYCIE SINGLEM Z WYBORU I DOŚWIADCZENIA W ZWIĄZKACH

ABSTRAKT

Brak intymnego partnera to częsty stan we współczesnych społeczeństwach postindustrialnych. Znaczna część singli jest samych z własnego wyboru, co oznacza, że wolą nie być w intymnych związkach. Obecne badanie miało na celu sprawdzenie, czy przeszłe doświadczenia w związkach przewidywały dobrowolne bycie singlem. Na próbie 629 greckojęzycznych uczestników odkryliśmy, że większość dobrowolnych singli miała inne priorytety, a następnie, grupę singli stanowili ci, którzy byli rozczarowani intymnymi związkami. Odkryliśmy również, że bardziej negatywne doświadczenia z przeszłości związane ze związkami wiązały się ze zwiększonym prawdopodobieństwem wpadnięcia w tę drugą grupę niż w innych grupach dobrowolnego stanu wolnego lub pozostawania w parze.

SŁOWA KLUCZOWE

samotność, dobrowolna samotność, przeszłe doświadczenia ze związkami, łączenie się w pary

INTRODUCTION

A considerable proportion of adult population in contemporary post-industrial societies is single that is, not in an intimate relationship (Klinenberg, 2012; Ortiz-Ospina, 2019; Wang & Parker, 2014). Some of the singles are involuntarily so, while others prefer not to be in an intimate relationship (Apostolou & Wang, 2019). Recent efforts have attempted to examine which factors predict each state of singlehood (e.g., Apostolou & Patsiarika, 2022). The current research aims to contribute to this literature by examining whether past experiences with relationships are associated with the probability to prefer to be single. We will start developing our argument by examining the reasons why people prefer not to be in an intimate relationship.

WHY PEOPLE PREFER TO BE SINGLE

Humans are a sexually reproducing species, which means that, in order to procreate they need to gain sexual access to members of the opposite sex. Yet, this is usually not sufficient for successful procreation, because human children require considerable, reliable and prolonged parental investment in order to reach sexual maturity (Kim et al., 2012; Lancaster & Lancaster, 1987). This fact has favored the evolution of a long-term mating strategy, where individuals establish lasting relationships and invest heavily to their children (Gangestad & Simpson, 2000). Accordingly, across different cultures and different times, the vast majority of people enter in such relationships that frequently take the form of marriage (Coontz, 2006). Even so, many individuals experience spells of involuntary or voluntary singlehood. For instance, one study employed a sample of 7,181 participants from 14 different post-industrial nations, and found that about 13% of the participants indicated that they were involuntarily, and more than 15% indicated that they were voluntarily single (Apostolou et al., 2023).

Given the evolutionary importance of being in an intimate relationship, it seems at first puzzling that many people prefer not to be in an intimate relationship. It has been argued that individuals are likely to prefer to be single in order to develop their qualities and become thus, more desirable as mates (Apostolou, 2017). In particular, in a long-term mate, people value being educated, having a good job, being well-off, and enjoying high social status, as these traits are associated with a good capacity to provide resources, which in turn, is crucial for supporting a family (Buss, 2016; Thomas et al., 2022). These traits are not innate, but can be developed during an individual's lifespan. Yet, doing so usually requires committing substantial resources such as time and money for a prolonged period of time. For example, getting a good education is costly and time-consuming. Similarly, advancing on one's career, requires effort and commitment. On the other hand, finding an intimate partner and keeping an intimate relationship also require allocating considerable resources. Thus, in certain circumstances, it could pay for people not to enter in the mating market, but divert instead the bulk of their resources in developing their qualities, and return to the mating market at a later time, having better chances to attract high quality mates. Consistent with this hypothesis, one study employed a combination of qualitative research methods, asking participants why they were single, and found that common reasons included "Worry that a relationship is going to be damaging for my career," "I have different priorities," "To focus on my career," and "To be free to chase my own goals" (Apostolou, 2017).

In addition, it could be the case that by being single, people reap fitness benefits through allocating the resources that would otherwise go to mating effort, to their genetic relatives (see Wilson, 1975, 1978 for a similar argument for the evolution of homosexuality).

Furthermore, Conroy-Beam et al., (2016) have shown that relationship satisfaction is predicted, not simply by mate preference fulfilment, but whether there are better alternatives. Similarly, Buss et al. (2017)'s mate switching hypothesis suggests that people are sensitive to alternative options when deciding whether to leave a current relationship. In this respect, people may choose to be single or not on the basis of the available alternatives.

Moving on, finding a partner requires allocating considerable resources such as time and money to improve one's looks. Similarly, keeping an intimate relationship requires considerable resources such as time to devote to a partner's needs. Thus, when people find themselves in relationships that do not work, and consequently end, they forgo all the investment they have allocated in finding and keeping their partner. They also suffer an opportunity cost, which equals the benefits they would get by being with a more suitable mate, and they did not by staying with their current one. Overall, when a relationship ends, people would find themselves in a fitness-compromising position: They forgo all the investment they have allocated to the relationship, while they lack an intimate partner. This scenario would trigger, negative emotions, punishing individuals for being in a situation that does not increase their fitness.

In particular, emotions are adaptations that motivate fitness-increasing actions meaning, actions that increase individuals' chances to have their genetic material represented in future generations (Tooby & Cosmides, 2008; see also Nesse, 2019). In particular, emotional mechanisms generate positive emotions such as happiness and pride when individuals find themselves in situations that increase their fitness (e.g., get a job promotion) that motivate the repetition of actions that have led to this outcome (e.g., keep working hard to be promoted). On the other hand, they generate negative emotions such as sadness and disappointment that punish people when find themselves in a fitness-decreasing situation (e.g., getting fired) in order to motivate them to take action to correct the situation (e.g., find another job), and not to find themselves in a similar situation in the future (e.g., find a job that fits better their qualities). In the context of the end of a relationship, in one study, participants were provided with scenarios related to breakup, and they were asked to identify the emotions related to this event (McCarthy et al., 1997). They reported negative emotions including disgust, unfriendliness, anger, frustration, and contempt.

Moreover, we hypothesize that these negative emotions would motivate people to take some time off the mating market, contemplating on what went wrong, so as not to repeat the same mistakes. Consistent with this hypothesis, in the study on the reasons for being single, participants frequently reported: "I am afraid that I will be disappointed," "Due to bad experiences from previous relationships", and "I am afraid that I will get hurt again" (Apostolou, 2017). A different study, analyzed responses to a Reddit thread on the question "Guys, why are you single?" (Apostolou, 2019). One of the most frequent category of responses was the "Bad experiences from previous relationships" that included items such as "My last relationship ended so badly I never want to be in one again," and "Because my last relationship was toxic as hell and now I avoid relationships to prevent being hurt that badly again."

THE CURRENT STUDY

Previous research has produced evidence, which is in accordance with our hypothesis that negative relationship experiences would lead people to prefer to be single. However, although this evidence is consistent with this hypothesis, it is insufficient to test it. One reason is that, it was based on qualitative studies, where participants may had been single for different reasons, but they justified their singlehood in terms of past relationships. For

instance, people may face difficulties in attracting mates, but instead of admitting it, they pass the blame to past mates and negative relationship experiences. Thus, what is needed is to measure past experiences with relationships and relationship status, investigating if there is the predicted association between the two, which is the purpose of the current study.

Moreover, as discussed in the previous section, voluntary singlehood is not a homogenous group, as people may prefer to be single for different reasons (see Girme et al., 2022). Our study, aimed to distinguish between those who prefer to be single in order to focus on accomplishing different tasks and those who prefer to be single because they have been disappointed by previous relationships. We predict that, past experiences with relationships, would predict membership in the latter category. In addition, a secondary objective of the current study is to examine the occurrence of the different types of voluntary singlehood.

METHODS

PARTICIPANTS

The study was conducted at a private university in the Republic of Cyprus, and has received ethics approval from the institution's ethics committee. Participants were recruited by promoting the link of the study on social media (Facebook, Instagram, Twitter), and by forwarding it to students and colleagues, with the request to forward it further. Participation was on a volunteer basis, and no compensation was given. The only requirement for participation was to be at least 18 years old. In total, 692 participants took part; however, for the purposes of our research, we included only participants who indicated that they had prior relationship experience. Thus, our sample consisted of 629 (377 female and 252 male) Greek-speaking participants. The mean age of women was 35.7 (SD = 11.5) years, and the mean age of men was 37.9 (SD = 11.5). With respect to relationship status, 21.0% of the participants indicated that they were "Involuntarily single", 20.3% "In a relationship", 19.9% "Prefer to be single," 18.8% "Married", 16.9% "Single between-relationships", and 3.2% "Other".

MATERIALS

The study was in Greek, was created using Google forms, and consisted of two parts. In the first part, participants were asked to indicate their experience with previous relationships. For this purpose, we developed a four-item instrument (see Appendix A) that participants had to rate in a five-point Likert scale: 1 – Strongly disagree, 5 – Strongly agree. Cronbach's alpha for this scale was .86. A higher average score indicated more negative experiences with past intimate relationships. In the second part, participants were also asked to indicate their demographic information, including sex, age, and whether they had been in an intimate relationship before (Yes/No).

Relationship status was measured using a previous instrument (Apostolou & Wang, 2019), which included the following categories: "In a relationship," "Married," "Involuntarily single: I want to be in a relationship, but I find it difficult to attract a mate," "Single between-relationships: My relationship has recently ended and I have not yet found another partner," "Prefer to be single: I am not interested in being in a relationship," and "Other." Participants who indicated that they preferred to be single, were subsequently asked to indicate the reason why. The following three options were provided: "I have been disappointed with relationships and prefer to be single," "At the moment I have other priorities and I don't have time for relationships," and "Other."

STATISTICAL ANALYSIS

Based on participants' answers, we created a relationship status variable with the eight levels: "in a relationship," "married," "involuntarily single," "single between-relationships," "voluntarily single – disappointed with past relationships," "voluntarily single – different priorities," "voluntarily single – other," and "other." For the purposes of our study, we employed multinomial logistic regression, where relationship status was entered as the dependent variable, and the average score of the past relationship experiences as the independent variable. Participants' sex and age were also entered as covariates.

RESULTS

Initially, we calculated the percentage of participants in each voluntarily single group. In particular, 11.8% were in the "voluntarily single – other priorities," 4.8% in the "voluntarily single – disappointed with past relationships," and 3.3% in the "voluntarily single – other" group. Subsequently, we calculated the percentages of different types of voluntary singlehood separately from other categories of relationship status. As we can see from Graph 1, almost 60% of the voluntarily singles indicated that they were single because they had different priorities, 24% because they had been disappointed by past relationships, and about 17% for other reasons.
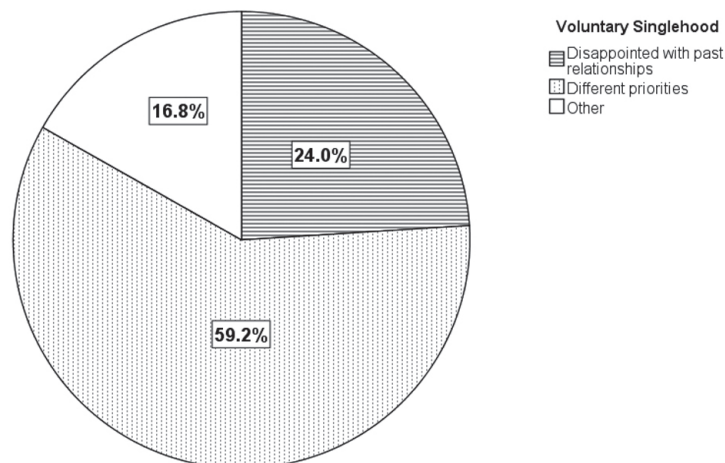

Figure 1. The figure above depicts the percentage of participants belonging in each category of voluntary singlehood

Moving on to the statistical analysis, the logistic regression model could not be fitted because in some categories there were very few observations. To address this issue, we dropped the "Other" category from the relationship status variable so that the model could be fitted. For this model, the Cox and Snell was .271, and the Nagelkerke was .279. The "Voluntarily single – disappointed with past relationships" was chosen as the reference category, because this type of singlehood constitutes the primary focus of our research.

The results indicated that there was a significant main effect of past relationship experiences [$\chi^2(6, N = 596) = 76.95, p < .001$]. As we can see from Table 1, more negative relationship experiences were associated with increased likelihood to be in the "voluntarily single – disappointed with past relationships" category than in other categories of relationship status. As indicate by the Odds Ratio (OR), the largest effect was over being married. In particular, one unit increase in the experiences with past relationships variable (indicating

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https://doi.org/10.21697/sp.2022.22.2.03

more negative experiences) was associated with a 75% [(1 – 0.25) * 100] decrease in the probability to be married than in the "voluntarily single – disappointed with past relationships" category. Similarly, with respect to the second biggest effect, one unit increase in the experiences with past relationships variable was associated with a 61% [(1 – 0.39) * 100] decrease in the probability to be in the "voluntarily single – other priorities" than in the "voluntarily single – disappointed with past relationships" category.

We can further notice that the coefficient for the involuntarily single group was not significant, indicating that past relationship experiences did not predict whether someone would be involuntarily single. In addition, we found that there was no significant interaction between the past experiences with relationships and participants' sex ($p = .850$). This finding indicates that the effect of past experiences with relationships on relationship status was similar across sexes.

Table 1. The effect of past experiences with relationships on relationship status

Relationship status	Past experiences			Sex			Age		
	Wald	*p*-value	OR	Wald	*p*-value	OR	Wald	*p*-value	OR
Involuntarily single	3.16	.076	0.68	0.63	.428	0.71	0.56	.455	1.02
Single between-relationships	5.92	.015	0.58	0.01	.943	0.97	3.79	.052	1.04
Voluntarily single – different priorities	16.12	<.001	0.39	0.03	.859	1.09	0.00	.947	1.00
Voluntarily single – other	8.44	.004	0.42	4.09	.043	3.79	4.09	.356	0.97
In a relationship	12.31	<.001	0.46	0.12	.726	0.86	1.06	.303	0.98
Married	34.82	<.001	0.25	4.03	.045	0.39	16.27	<.001	1.10

Note. The reference category for the relationship status is "Voluntarily single – disappointed with past relationships." The reference category for the sex is "women."

DISCUSSION

We found that, in our sample, about one in five participants was voluntarily single. From those who preferred to be single, about one in four were so because they had been disappointed by previous relationships. Moreover, we found that experience with romantic relationships was a significant predictor of relationships status, with more negative experiences to be associated with increased likelihood to be voluntarily single.

Consistent with the evolutionary theoretical framework and empirical findings in the area (Girme et al., 2022), our results indicate that the voluntarily single group was not homogenous, but people preferred to be single for different reasons. The most common one was in order to prioritize on achieving other goals. Yet, about one fourth of the voluntarily singles, indicated that they were so because they had been disappointed by previous relationships. In addition, about 17% percent indicated that they preferred to be single for other reasons, suggesting that the voluntarily single group could be further divided. However, because this is the first attempt to examine the occurrence of the different subcategories of the voluntary single group, and because our study was based on a non-probability sample, more replication studies are needed in order to get a better idea about how voluntary singlehood is distributed.

Consistent with our hypothesis, people who had bad experiences with past relationships were more likely to be prefer to be single. In qualitative studies, people frequently indicated that they were single because they had negative experiences from past relationships (e.g., Apostolou, 2019). As discussed in the introduction, it could be the case that people were single for other reasons, but chose to justify their singlehood on the basis of bad experiences with previous relationships. Our findings demonstrate that this is not the case, as people

who indicated that they had bad experiences in past relationships, were also more likely to be voluntarily single.

Moving on, in our theoretical framework, opting out from the mating market due to bad relationship experiences, is a fitness-increasing strategy because it would enable individuals to work on what went wrong and make better future choices (Apostolou, 2017). This being the case, people would not prefer to stay single forever, but the emotional wound would eventually heal, and they would choose to reenter the mating marker at a later time, a prediction that future research needs to test. There is also the possibility that the emotional wound is such that people may choose not to reenter the mating market at all, or delay doing so for a very long time. This choice would have a potentially large negative effect on one's fitness, so we predict that such instances would be rare, a prediction that future research needs also to test.

One limitation of the current study is that it was based on a non-probability sample, so its findings may not readily apply to the population (but see Coppock et al., 2018). Similarly, our research was conducted in the Greek cultural contexts, and its finding may not generalize to different cultural settings. In addition, our study is correlational thus, causality can only be indirectly inferred. Moreover, we found an association between past experiences with romantic relationships and voluntary singlehood. Yet, additional variables need to be considered if this association is to be better understood. In particular, variables such as personality may predict past relationship experiences. This being the case, personality or other variables could have an indirect effect predicting voluntary singlehood through predicting past relationship experiences.

Similarly, because bad experiences from previous relationships do not affect everyone the same way, future research should look at the moderating roles of coping strategies, hopefulness, mating options, perceived mate value) and so on. This work could possibly lead to the development of possible interventions. Future studies could also attempt to make a more refined categorization of singlehood, taking into consideration other subgroups like the incels (see Costello et al., 2022).

Our findings indicate that people prefer to be single, predominately in order to focus their attention on aching different goals, but also because they have been disappointed by past relationships. They indicate further that membership in the latter category, is predicted by past relationship experiences. However, more replication and extension studies are needed in order to understand this association.

APPENDIX A

Below is the instrument developed to measure past experiences with relationships. In order to find the score for each participants, questions "2" and "4" need to be reverse-scored, and all the items to be summed and be divided by four.

1. Please indicate to what extent you agree or disagree with the following statements:
2. My previous partners had hurt me
3. I had good experiences from my previous relationships
4. My previous relationships were traumatic
5. My experience with my previous relationships was more positive than negative

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