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Mental Health and Cognitive Distortions Across Different Types of Singlehood

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Abstract

Whilst traditionally singlehood has been considered a risk factor for mental health, the rise of solo living has spurred interest to investigate this association closer. My research aimed to address the mixed results of previous literature by developing an evolutionary theory-informed classification system of singlehood and exploring mechanisms behind the mental health of singles. Two independent cross-sectional studies ($n = 389$ and $n = 290$) investigated what singlehood clusters emerge based on singlehood reasons, what defines them and how they predict mental health outcomes. 3 singlehood circumstances were identified in Study 1: singlehood due to problems, singlehood by choice and singlehood for freedom. And 4 were identified in Study 2 singlehood due to insecurities, singlehood by choice, singlehood for freedom, and singlehood due to interdependency difficulties. Singlehood due to insecurities was associated with the most mental health risks, followed by singlehood by choice, while singlehood for freedom was associated with positive outcomes and singlehood due to interdependency difficulties did not significantly explain variance in singles' mental health. Cognitive distortions were identified as a mechanism behind mental health difficulties, significantly mediating the associations between singlehood types and their corresponding mental health outcomes. Wider influences such as social support, locus of control and sexism were of less influence than anticipated yet contributed to unique subgroup effects. The nuance of emerged singlehood clusters and the role of cognitive distortion is discussed in light of the interplay of evolutionary pressures and modern social environments, offering avenues for the development of targeted support and highlighting the importance of representative research. Need for further validation in more diverse samples and the limitations of this exploratory and preliminary research is also discussed.

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Declaration

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

This thesis is the result of my own investigations, except where otherwise stated. Correction services have not been used. Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

I hereby give consent for my thesis, if accepted, to be available for electronic sharing after expiry of a bar on access approved by the Swansea University.

Signed: Malgožata Ragoško (candidate)



Date: 28/09/2025

Chapter 1: Introduction

According to the Oxford English Dictionary, *singlehood* is the state of being single or unmarried; spinsterhood” (Oxford English Dictionary, n.d.). The word’s frequency of usage in printed sources has skyrocketed by 200% from 1900 to 2000, as demonstrated by the search engine Google Ngram Viewer (Google, n.d.). However, this is not just a linguistic quirk. Singlehood is discussed because it is happening at a rate that raises it to the level of a societal phenomenon. For example, in the UK the number of people who have never been married or in a civil partnership has risen from 23.7% in 1991 to 37.9% in 2021 (Office for National Statistics [ONS], 2023). Even higher numbers have been established in the US, where the reported number of singles as of 2020 was 49% of the adult population – almost double the percentage from 1960s (Marino, 2023). The change is increasingly driven by previously married singles, as divorce rates steeply rose thorough the 20th century (Schweizer, 2020), while rates of remarriage have plummeted by 50% since 1990 (Reynolds, 2021).

The rise of singlehood is not solely due to the dissolution of traditional institutions, such as marriage, and hence official statistics not capturing romantic relationships that do not (yet) progress into marriages/civil partnerships. In fact, the current institution of marriage, which is established and bound by legal terms, is a modern concept and what would be socially recognised as marriage in ancestral environments, would have been simply long-term pairbonding marked by joint cohabitation and conjugal relations (Kramer, Schacht & Bell, 2017). Therefore, it might seem like changes to relationship formation and the shift in values, which corresponds with a rise of cohabitation without legally established marriage, should support a positive trend. Indeed, cohabiting households have risen from 1.5% of all US households in 1977 to 4.5% in 1997 (Casper & Cohen, 2000). The rise has become the most prominent in the last decade and amongst young adults, as seen in the US statistics of 25-34

year olds increasing from 7% in 2012 to 17% in 2022 (Julian, 2023). Still, the numbers of cohabiting relationships do not make up for the fact that 1 in 3 households are one-person households both in the UK and US (ONS, 2022; U.S. Census Bureau, 2023).

These changes are observed all around the world, but one consequence of the currently observed trends in singlehood is particularly evident in non-Western societies. Singlehood becoming a more normative way of living corresponds with a steady increase of age at first marriage in countries such as Taiwan, Japan and Korea, with the mean for men being 30 and for women – 28 years. This is a significant change for cultures where till 1980s marriage constituted a central institution – in East Asia less than 5% of adult population remained unmarried by the age of 40 (Jones, 2017). As a result of postponement and overall decrease in marriage rates, Eastern countries report increasingly low birthrates, as contrary to Western countries, childbearing outside of marriage is very rare there (Sobotka, 2021; Raymo et al., 2015). And while a substantially higher number of births happens outside of marriage in many European and Western countries, e.g., the number increased from 17% to 42% in the EU countries (almost 40% in the US) (Taylor, Funk & Clark, 2007), – birth rates in the EU have decreased twofold since 60 years ago, with an average of 1.46 live births per woman (EuroStat 2020; EuroStat 2023). These findings alongside projected 21st century global fertility rates (Vollset et al., 2020) raise alarm bells: current singlehood trends clearly defy fundamental function of all living organisms – reproduction.

What's even more puzzling is that an element of these changes is the seeming preference and contentment with life without rather than with a partner – 50% of single respondents in the sample of US citizens admit to not be currently looking for a partner, while 1 in 3 of Chinese participants indicate preference for being single (Brown, 2020; Apostolou, 2019). In fact, what previously was a transitory period between childhood and marriage, with a clear aim of achieving the latter (for example, 18th century debutantes being formally

introduced as available for marriage), has currently become a deliberate choice and even a sense of identity (Kislev, 2023). Moreover, whilst historically singlehood had carried negative connotations, as in the case of spinsterhood, nowadays it is often seen as progressive and empowering, with emerging evidence suggesting that the youngest generations indeed report high satisfaction with being single (Beckmeyer & Jamison, 2023; Gonzalez Avilés, 2024).

Singlehood and Wellbeing

Regardless of the wider-scale implications, the rise of singlehood is concerning because relationships offer benefits to our wellbeing that are less or not available to single people. For example, in terms of immediate effects, intimate relationships are typically characterised by higher frequency of various forms of physical closeness (e.g., holding hands, hugging, kissing, sex), which is associated with a reduction of stress and inflammatory processes, better sleep and overall mood (Thomas & Kim, 2021). While sexual behaviours specifically, lead to a release of endorphin – hormone known as body’s own analgesic (Rokade, 2011); as well as, oxytocin and dopamine, which play a role in emotional attachment, have been argued to have evolved to increase human reproductive success, and simply feels “good” by promoting experiences of contentment, pleasure and bliss (Fleischman, 2016; Zeki, 2007; Ito, Shima & Yoshioka, 2019; Sayin, 2019). Furthermore, it is well known that supportive relationships are beneficial in managing mental illness (Cullen et al., 2017; White et al., 2021;), but it is romantic relationships specifically that those affected by psychological difficulties identify as the crucial element in their journey to recovery (Boucher, et al., 2016), while higher relationship satisfaction is associated with lower incidence of symptoms and better wellbeing overall (White et al., 2023).

The disadvantaged position of single people becomes even more apparent in light of relationships’ implications for psychological and physical health long-term. While benefits of

meaningful social connections and broader social networks are undeniable (Ryan, Wan & Smith, 2014), the effects of having a partner are unparalleled (Berge et al., 2012). For example, one of the longest running studies of adult development that followed participants for almost 85 years provides evidence that it is relationships more than wealth, IQ, social class and even genes that play a deciding role in our health and happiness (Waldinger & Schulz, 2023). Marital satisfaction is highly correlated with life satisfaction ($r=.51$) and at the age of 50 is found to be more predictive of good health at the age of 80 than biological markers such as cholesterol (Heller, Watson, & Ilies, 2004; Harvard Gazette, 2017) and has an attenuating effect over the experience of physical pain ($r = .36$ for men and $r = .54$ for women; Waldinger & Schulz, 2010). It is also linked with better mental health and less cognitive decline in older age, while more frequent sexual activity and emotional closeness in adults aged 66 + is associated with better episodic memory performance (Allen, 2018). The link between social relationships – especially strongly integrated ones such as marital – and physical wellbeing has been also evidenced in a meta-analytic review of 148 studies, which found that even when controlled for sex, age, and initial health status, adequate social relationships increase the likelihood of survival by 50% – the effect comparable to quitting smoking (Holt-Lunstad, Smith, & Layton, 2010; Goldman, Korenman & Weinstein, 1995).

Unfortunately, singles not only miss out on the benefits that emotionally and sexually intimate relationships offer but are also at risk of additional consequences associated with not having a partner. A large cross-cultural longitudinal study that followed over 20000 participants for 4 to 18 years established that nonmarried individuals were significantly more likely to experience depressive symptoms than their married peers, with the risk especially pronounced in males and those with higher educational attainment (Zhai et al., 2024). These disadvantages seem to remain significant when singles are compared to individuals in any committed arrangements, with some research suggesting that even non-marital relationships

offer protective effects over general mental health, a reduction of risky behaviour rates (such as binge eating and reckless driving), and are associated with higher subjective wellbeing (Soons & Liefbroer, 2008). However, the results vary, some studies find little or no effects (Adamczyk & Segrin, 2015; Carotta et al., 2023), and others suggest that rather than mental health risks, it is loneliness, for example romantic loneliness, that is higher in those who are single (Adamczyk, 2017).

But even if it is just loneliness (not direct mental health consequences) that is significantly more likely to affect singles than married people (Page & Cole, 1991, Victor et al., 2005) or those in committed nonmarital relationships (Bernardon, et al., 2011; Adamczyk, 2016) the association is just as concerning. As demonstrated by Waldinger & Schulz (2023) the ultimate ill-effect of loneliness is shorter life expectancy, however, there is also a plethora of more immediate risks. A longitudinal study of more than 2200 people born in the UK in 1994 and 1995 (Matthews et al., 2019), which investigated the effect of childhood experiences and circumstances on health and functioning in young adulthood, found that higher levels of loneliness are associated with highest likelihood of meeting diagnostic criteria for a range of mental disorders, poor health, more visits to a medical professional, poor coping strategies, low life satisfaction, bleak outlook on life in the future, and negative economic impacts such as lower education and educational prospects. Interestingly though, it is the same age group – the young adults (16-24) – that currently are the loneliest – 40% experience loneliness “often or very often” as found by a BBC loneliness study of 55 000 participants (Qualter, Barreto & Victor, 2024) and report the highest satisfaction with being single (Gonzalez Avilés et al., 2024).

Singlehood: Positive vs. Negative Experience?

But singlehood must be not an exclusively negative experience considering the increasing numbers of people who actively choose to live without a partner. And – as I have briefly mentioned before - some even attribute their thriving to being single and report that it is singlehood specifically that offers them opportunities and benefits they would not experience otherwise (DePaulo, 2023a). For example, personal freedom and autonomy to be able to dedicate oneself to personal interests and values are some of the reasons people value strongly in their experience of being single (DePaulo, 2023b). In fact, “More time for myself”, “Focus on my goals” and “No one dictates my actions” are the most highly rated advantages of singlehood (Apostolou & Christoforou, 2022). As mentioned earlier, some singles enjoy wellbeing comparable to those in relationships (Adamczyk & Segrin, 2015) and even the effects of loneliness might not be as detrimental as previously thought considering the evidence to suggest that single people fulfil their need of belonging through psychological attunement to their friendships (Fisher et al., 2021), have significantly more social connections and are more involved with the wider community, e.g., family, neighbours (Sarkisian & Gerstel, 2016). However, current literature on mental health in singlehood is too scarce and inconclusive to explain this level of nuance.

It might seem obvious that just like no two relationships are the same and one’s experience depends on individual circumstances, the same should apply to singlehood. But whilst it is seemingly standard practice in research investigating mental health in relationships to take into consideration factors such as quality of the relationship, e.g., healthy vs. unhealthy (Braithwaite & Holt-Lunstad, 2017), or subjective satisfaction with it (Røsand, et al., 2012), the recognition of the diversity in the experience of singlehood is very limited. This is despite the growing evidence that people stay single for a variety of reasons driven by a range of psychological motives (Apostolou et al., 2020). In fact, as many as 76 individual reasons were identified in a qualitative study that employed an open-ended questionnaire

method, which were then grouped into three domains: ‘Freedom of choice’, ‘Constraints’, “Difficulties with relationships” (Apostolou, 2017). Four domains, i.e., ‘Low capacity for courtship’, ‘Freedom’, ‘Constraints from previous relationships’ and ‘Personal constraints’ were uncovered in a study that rated an even higher number of 92 reasons for being single (Apostolou & Esposito, 2020). Such breadth of motivations might be key to understanding the diversity of singlehood experience, however, how they translate into wellbeing outcomes is unknown.

Although limited, there is some emerging evidence to confirm that psychological heterogeneity amongst singles depends on their personal motivations, specifically, factors such as choice. For example, both singlehood and life satisfaction are significantly lower in those who consider themselves single due to internal or external barriers preventing them from establishing a relationship, i.e., involuntary singlehood (Fitzpatrick, 2023; Apostolou et al., 2019). On the other hand, Girme, Park & MacDonald (2023) suggest that in line with Self-determination theory (Deci & Ryan, 2000), voluntarily single – those whose singlehood is intrinsically motivated, i.e., self-endorsed, find the experience more positive and view it as an avenue for personal fulfilment, which they pursue in other life areas (Apostolou, M., & Michaelidou, 2022). While some studies support that this categorisation corresponds with wellbeing outcomes, for example, involuntary single report higher incidence of negative emotion as well as mental illbeing symptoms than voluntary single (Apostolou et al., 2019), the results so far are mixed and inconclusive (Adamczyk, 2017).

This might be because exploring mental health of singles through voluntary vs. involuntary lens is simply too narrow to capture the full spectrum of singlehood typology. For example, just the voluntary category can encompass a wide range of experiences – from “I am single because I don’t want to commit to one person” to “I am single to protect myself from being hurt”. Which might be the reason why the effects of psychological traits and

experiences that are otherwise widely associated with specific mental health outcomes, when it comes to singlehood – are not so straightforward. For example, sociosexuality, which is a concept that encompasses individual's willingness to engage in sexual activity outside of the committed relationship, is generally higher in singles than partnered individuals, however, its effect on mental health of singles varies across studies (Gromkowska-Melosik, Hordecki, & Szymczyński, 2022; Gangestad & Simpson, 2000). For those who report unrestricted sex life to be their reason to remain single (Apostolou, Jiaqing & Esposito, 2020) it might help fulfil that desire. Satisfying sex life is indeed one of the major predictors of a satisfying singlehood (Park, Impett & MacDonald, 2021). However, it is also reported to have no effect on the formation of long-term relationships and associated with personality characteristics that are deemed unattractive, e.g., dark triad traits (Fernández del Río et al., 2019); as well as higher likelihood of experiences that contribute negatively to one's mental health, e.g., experience and perpetration of sexual harassment (Bendixen & Kennair, 2017; Kennair & Bendixen, 2014).

The lack of within-group classification of singlehood inevitably produces research that is non-representative as it captures the average rather than the type-specific experience. For example, singles are greatly outperformed by those in relationships on a measure of mating performance, which encompasses abilities such as flirting, mate-signal detection and confidence (Apostolou et al., 2019) and is associated with lower mating effort (Apostolou et al., 2023). But considering that all relationships are formed by once-single individuals, clearly – some must be able and keen enough to do so. Similarly, when compared with those in committed relationships, single people are more likely to be characterised by insecure relationship styles, such as attachment anxiety or avoidance, which are associated with both poorer individual wellbeing and relationship outcomes (Chopik, Edelstein & Fraley, 2013; Candel & Turliuc, 2019). Yet again – simply the fact that healthy and secure relationships

exist evidences that not all once-single individuals are characterised by unhealthy attachment dynamics.

Evolutionary Perspective on Singlehood

We are navigating the domain of mating using the most refined psychological systems, which we developed through many generations of evolutionary selection (Darwin, 2009). Genes that coded phenotypes less able to produce offspring were gradually eradicated and replaced by those which increased mating success. For this reason, we are currently attracted to direct and indirect cues of youth, health, kindness and – considering the overwhelming consensus evidenced by largescale cross-cultural research – most of what one might think to be important traits in a partner (Buss et al., 1990; Takayanagi et al., 2024). Mating preferences is just one of many topics we owe our understanding of to evolutionary psychology (Buss & Schmitt, 2019). But while this area of psychology has contributed to our knowledge of general mental health (Willers et al., 2013; Crespi, 2020) and produced a breadth of insight on romantic and sexual relationships (Buss & Schmitt, 1993; Gangestad & Simpson, 2000; Haselton & Buss, 2000; Bendixen, 2014; Buss et al., 1992), the limited research on mental health in singlehood is still theoretically barren. This, I believe, might be one of the reasons why the literature so far is conflicted and the phenomenon poorly understood. The current gaps, however, can be addressed through the evolutionary perspective, which could also help explain the variance in singlehood experience by investigating for whom and under what circumstances it is experienced positively versus negatively. It is important to clarify here that evolutionary framework is a theoretical tool, which I draw on to better understand wider structures of human psychology. However, I make no attempt to narrow down direct mechanisms that guide the experience of singlehood as this is beyond the scope of this cross-sectional research.

The way our modern brains operate is built on mechanisms, which developed to overcome adaptive challenges of ancestral times (Tooby & Cosmides, 1990). An example of such are emotions as they direct us to or away from stimuli based on their emotional valence, which is a mostly reliable indicator of what is safe and useful, as opposed to otherwise (Elliot, 2006). When it comes to mating, they serve as a proximate mechanism that motivates us to do so in the first place and then serves as a measure of success (Apostolou, Alexopoulos, & Christoforou, 2023). In fact, our sensitivity to social contexts and the diversity of emotional landscape we experience when interacting with other humans, provides a strong argument that emotions and feelings serve as a powerful tool in solving adaptive problems associated with reproductive success too (Al-Shawaf, et al., 2016).

The domain of pair-bonding is characterised by a wide spectrum and intensities of emotional and psychological experiences (Fisher et al., 2002). Romantic love is “one of the most overwhelming of affective states” (Bartels & Zeki, 2000). When reciprocated it evokes feelings of bliss and joy (Sternberg, 1986). Personal growth is reported to be one of the major benefits of entering into a new romantic relationship (Roepke, 2013), whilst falling in love is often associated with an increase in self-esteem and sense of self-efficacy (Aron, Paris & Aron, 1995). Romantic experiences offer an immediate and sustained increase in positive and a decrease in negative affect to an extent significantly larger than other life domains, e.g., family or academic events (Blumenstock, Papp, & Connell, 2022). On the other hand, unreciprocated love and the ending of a love-bond, as in relationship dissolution, is associated with extreme mental distress, depression and even experience of physical pain (Flaskerud, 2011).

Although self-evident, it is worth highlighting that the psychology of modern humans is built on the experiences of ancestors who cared about procreation, as those, who for whatever reason did not, simply put, did not have descendants. Therefore, negative emotions

as a consequence of singlehood are not so surprising, considering not having a partner was (up until not that recently) not only an unfavourable, but even dangerous circumstance. From an evolutionary perspective, the disadvantage of being single lies in, first of all, the lack of security that having a partner offers: proximate, i.e., protection and care for oneself; and ultimate, i.e., continuation of genes by producing offspring (Fisher, 2017). However, our evolved preference for establishing a committed long-term relationship with – preferably – a high quality partner due to importance of bi-parental care (Flinn et al., 2007) is just one of several reasons why pair-bonds were and continue to be so important.

While currently one can be single and live a comfortable life, in ancestral times such status had wider and stronger consequences. Being partnerless denied one the wider support and resources available to those in committed relationships through extended in-law and acquaintance networks (Leonetti & Chabot-Hanowell, 2011). In turn, the lack of strong social connections diminished the quality of life as well as the sense of safety and security (Agashe, Kumar & Rai, 2021). At the same time, inability to attract a partner indicated that one lacked sought after qualities, which had implications for social rank and status (Zhang, & Santtila, 2022). Therefore, given that not having a partner diminished one's safety, comfort of living, negatively shaped their sense of identity and ultimately – made one and evolutionary dead-end – feelings of sadness, anxiety and even despair seem understandable. Just like sensations of physical pain – they signal the disruption of the most optimal way of being, which perhaps, if prolonged, evolved to progress into what in modern times we consider symptoms of mental illbeing (Shikdar, & Alghamdi, 2021; Apostolou, Alexopoulos & Christoforou, 2023).

Singlehood Types from an Evolutionary Perspective

The fact that evolutionary pressures caused humans to develop strong motivation to seek committed relationships does not imply that being without a partner was ever an unusual

or rare event. From the period of early sexual maturity before entering a relationship, to widowhood, and circumstantial singlehood due to limited access to potential mates during times of war, conflict and population bottlenecks so prevalent in ancestral times (Kramer, Schacht & Bell, 2017) – a variety of singlehood forms existed all thorough history. Not all reasons for living without a partner were negative and, although not explored in research yet, it would seem plausible that neutral or even positive circumstances that led people to singlehood, would contribute to a different experience of it too.

Apostolou (2017) suggests that under certain circumstances remaining single was, in fact, more beneficial to one's adaptive fitness than being in a relationship. For example, because attracting a partner is in part dependent on whether one possesses qualities and characteristics that are sought by the opposite sex, e.g., resources, one might choose to temporarily put relationship formation on hold in order to focus on developing in those areas (Buss, 1989). Similarly, individuals who due to characteristics such as high physical attractiveness are able to attract multiple partners, might choose casual arrangements over a committed relationship as they provide sex-specific advantages too. Importantly, these two reasons are also non-exclusive, i.e., one might enjoy casual relationships whilst developing oneself for a partner they would like to settle for in the future.

If emotions are meant to signal evolutionary danger, the above singles would be expected to experience less distress than singles for whom that challenge seems difficult or impossible to overcome. In fact, singles whose situation was directly linked to their poor mating potential would have developed those feelings because our evolved motivation to seek that what feels good and avoid that what feels negative would enhance their mating success too, e.g., distress due to loneliness motivates people to reach out (Pazhoohi & Arantes, 2017). However, this mechanism does not always operate perfectly – while there is some evidence to confirm that involuntary single experience elevated levels of negative emotions, sometimes

they are associated with mating resignation rather than increased effort (Apostolou et al., 2023; Apostolou & Wang, 2019). Which in those cases not only does not resolve the source of distress but potentially promotes it even further.

What Maintains Negative Experiences of Singlehood?

If then, our emotions are supposed to aid not handicap us in relationship formation, it is increasingly curious why some single people experience such adverse and counterproductive wellbeing consequences. So far, no dedicated research has aimed to investigate what might be the psychological mechanisms that underpin the association between not having a partner and mental health, but insights can be drawn from the wider literature. For example, cognitive distortions, which are one of the key processes that maintain mental illness, are observed at elevated levels in some groups of singles, e.g., incels, but their influence in general singlehood is currently unknown (Costello et al., 2024).

Cognitive distortions were first identified as maladaptive patterns of thinking by Aaron Beck who observed that many of his depressed patients express similar patterns of thinking, such as arbitrary inference, selective abstraction, overgeneralisation, magnification and minimisation, personalisation, and absolutistic dichotomous thinking (Beck, 1963, 1964). Cognitive distortions have been established as one of the maintaining processes of emotional disorders such as depression, as this condition is characterised by thinking patterns resistant to one's experience (Yurica & DiTomasso, 2005). Beck's original work laid the foundation for what has since become one of the most popular forms of therapeutic work – cognitive behavioural therapy (CBT; Butler et al., 2006; Fenn & Byrne, 2013).

The evolutionary perspective argues for the utility of cognitive distortions and suggests that they are a form of heuristics that have evolved to promote less effortful and quicker processing of potentially dangerous situations, thus, increasing the chances of

survival (Gilbert, 1998). It is easy to see how despite being irrational, reasoning such as catastrophising, e.g., “If I go down this alley, I will get attacked”, has a protective function through the reduction of risk taking. But even though erroneous patterns of thinking help increase our chances of continuing the generational chain, they still impact us in ways that are detrimental. To begin with, cognitive distortions are not reflective of reality and are predominantly skewed towards interpretations that are negative (Gross, 2012). This is damaging to our wellbeing, especially, over the long term (Tecuta et al., 2019). Moreover, because they can be further reinforced by life experiences and, according to the cognitive approach, are maintained through the negative feedback loop, they become stronger and more deep-rooted if unchallenged (Beck; Emery & Greenberg; 2005).

Other than the association with poor mental health and clinical disorders (Kaplan et al., 2017; Kostoglou & Pigeon, 2016), heightened levels of cognitive distortions have an established link with conspiracy beliefs (Gagliardi, 2025), lower self-esteem and self-handicapping behaviours (Yavuzer, 2015). Coincidentally, the above psychological experiences and elevated levels of cognitive distortions are observed in specific singlehood populations. For example, an extreme group of singles – incels (involuntary celibates) – a predominantly online community of men who consider themselves unable to form romantic or sexual relationships. Incels have poorer mental health than the general population (Sparks, Zidenberg & Olver, 2024) and higher levels of distorted thinking, which are well evident in the misjudged beliefs they hold about women’s preferences, such as overestimating the importance of physical attractiveness whilst underestimating personality traits (Costello et al., 2024).

The opportunity to unite over the shared world view of black-pill (i.e., belief that there is nothing they can do about their mating prospects) and misogynistic ideology in their online communities gives members a sense of identity and belonging (Maryn et al., 2024;

Costello & Thomas, 2025). However, the social isolation of these platforms fosters radicalisation (Bright et al., n.d.) and reinforces derogatory and distorted beliefs even further. Such internal dynamics alongside incels' high external locus of control, which suggests lack of belief in one's control over life events, make it increasingly difficult for incels to even attempt to change their situation. This simultaneously curbs their mating success and the opportunity to challenge the distorted beliefs. All of which contributes to the maintenance and potential further exacerbation of their mental health.

But despite the fact that the modern world is marked by the highest ever gender equality, incel platforms are just the tip of the iceberg of online communities built on shared hostility and prejudice towards the opposite sex (World Economic Forum, 2024; Pham et al. 2020; Ribeiro et al., 2021). Unfortunately, to avoid the influence of the so-called mansphere is virtually impossible, which is worrying considering even unintentional exposure to this content has been shown to promote misogyny and mistrust (Renstrom & Back, 2024). Sexist attitudes and behaviours might steer one towards a similar partner, but because both hostile and benevolent sexism have been associated with reduced relationship satisfaction and length and higher frequency of conflicts, it seems like the negative consequences of prejudiced gender beliefs are experienced even by those who condone and seek out partners that express them (Hall & Canterbury, 2011; Hammond & Overall, 2013; Barreto & Doyle, 2023). Without doubt, such worldview is also consequential to those outside relationships because being more likely to attract specific individuals whilst deterring others inevitably shapes and impacts singles' wellbeing too. However, research on the effects of sexism in singlehood is limited

Additionally, Apostolou (2017) suggests that some singlehood is the result of the influence of the phenomenon known as Mismatch (Tooby & Cosmides, 1990). According to this theory, contemporary societies are vastly different to those we have evolved to navigate,

causing some people to lack adaptations necessary to overcome many adaptive challenges, including relationship formation (Li et al., 2017). Mismatched environments might therefore not only make it more difficult for certain singles to establish a relationship but also impact their mental health directly. One example of Mismatch is the change in social cohesiveness and social support.

Social support – even just the perception of it – is important to our wellbeing (Uchino, 2009). This is because, as I have mentioned earlier, historically, reliable social alliances ensured safety and quality of life (Slavich, Cannon & Widiger, 2020). They used to play a crucial role in the formation of relationships too – through parental and wider social involvement (Apostolou, 2012; Bouchet-Valat & Grobon, 2021). Nowadays, however, communities are less cohesive and influential (Symons, 1979) and relationship formation less determined and constrained by one’s social circle and background. For example, a longitudinal study on relationship formation patterns in France has noted a steep decline of parental approval of their children’s partners up until 1968 and an upward trend since then (Bouchet-Valat & Grobon, 2021). These changes are also reflected in the fact that while in 1919 around 40% of couples met through family or in the neighbourhood, - in 2014 that was the case for only 9%.

While these social shifts are still emerging in countries with a strong culture of arranged marriages, e.g., India, in the West – relationship formation is almost entirely an individual endeavor (Allendorf & Pandian, 2016). In fact, people increasingly meet new partners without the intermediation of any of their already familiar social circles (Rosenfeld, Thomas & Hausen, 2019), which from an evolutionary perspective, is a completely novel and potentially risky trajectory of relationship formation. For example, if people’s decision-making is not informed by knowledge and – perhaps most importantly – care of those who

are looking out for them, they might be less likely to prioritise mate characteristics crucial for long-term relationship outcomes (Apostolou, 2010).

But it is not only the direct role, e.g., match making or guarding against unfavourable partners, that our social circles used to play in relationship formation. Due to the bi-directional nature of social bonds, our kin were also observant and sensitive to cues of adaptive risks, e.g., singlehood, and were the ones to support us through the associated challenges (potentially because individual successes or failures were more impactful on the collective outcome of the social group) (Apostolou, 2010; Nettle et al., 2008). In simple terms, the tendency for distress we evolved to experience when unable to attract a partner, evolved alongside psychology of coping when surrounded and taken care of by our close kin. Nowadays, however, due to the changing social dynamics, traditional sources of support in mating – family and friends, are not as available anymore and for many people have been replaced by dating apps.

The opportunity for connection with anyone in the world, the ease of use, and the consumeristic design of dating apps attract growing numbers of users and generate skyrocketing revenues (Business of Apps, 2023; Pew Research Center, 2023). But although helpful for some, overall, they do not facilitate a greater success neither in short nor long term mating (Grontvedt et al., 2020), produce relationships that are more likely to dissolve than relationships where people met their partner offline (Paul, 2014), and are associated with a plethora of mental health risks, including higher levels of depression, anxiety and overall distress (Holtzhausen et al., 2020), lower levels of appearance satisfaction, body shame and lower self-esteem (Rodgers et al., 2020; Strubel & Petrie, 2017), and an exacerbation of preexisting mental health conditions (Rydahl et al., 2021). Unfortunately, yet in line with my theory, loneliness is a significant predictor of dating apps use, suggesting that it is individuals

with the least social connections and support that are the most likely to resort to this form of mating (Sumter, Vandenbosch & Ligtenberg, 2017; Drouin et al., 2016).

What Might Protective Factors Be?

Decreasing lack of support puts more emphasis on personal efficacy, which as we have seen in the case of incels, might be challenging for those with an external locus of control. The increased personal responsibility for one's mating outcomes might drive feelings of insufficiency and elicit distorted beliefs in those who feel unable to achieve the desired outcome. In fact, self-defeating reasons for being single, e.g., "I feel like people don't want to date me/I am single because potential partners are not attracted to me." (which indicates both externality and an element of distorted thinking, such as generalising or emotional reasoning) are associated with singlehood perceived negatively (Beckmeyer & Jamison, 2023).

Outcomes associated with this psychological construct are dependent on its orientations, e.g., externality is associated with better physical and psychological health outcomes as well as academic and job performance, whereas internality with more illness, stress and passivity (Van Liew, 2020; Ng, Sorensen & Eby, 2006). The same could potentially apply to experiences in singlehood.

For example, external locus of control is associated with belief in luck and forces outside of one's influence, whereas people with stronger internal locus of control tend to attribute their successes and failures to personal actions (Rotter, 1966). Similarly, external locus of control has been observed in those high in neuroticism and low self-esteem, which is inevitably linked with challenges in interpersonal contexts (Simonetti, 2024; Žitný & Halama, 2011; Maheshwari & Chadha, 2021; Fontanesi et al., 2024). In fact, social confidence, self-esteem and high as opposed to low mating effort and shyness is associated with better mating success (Li et al., 2020; Apostolou et al., 2019). Altogether, these findings

suggest that one's perceived control over life events may have implications for their mating beliefs as well as outcomes and may, therefore, potentially explain some of the variance in singlehood wellbeing too.

Similarly, despite the fact that family and friends do not get as involved in relationship formation anymore, their support is expected to contribute to singles' mental health still. Any meaningful social relationships play a role in our wellbeing and those who have a partner benefit from having strong connections with their wider networks too (Haggerty, Bradbury & Karney, 2022). Because we draw on different people for different needs, singles with wider social networks might still be able to meet needs, which otherwise they would have predominantly fulfilled within a romantic relationship (Antonucci & Akiyama, H, 1987). Additionally, wider social circles increase one's mating success by ensuring a bigger pool of potential mates, e.g., friends of friends. Therefore, singles who enjoy more social support through meaningful and strong relationships with friends and family are expected to fare better than those who are socially isolated (Adamczyk, 2016).

Research Objectives

This thesis aims to reevaluate the current view that single people are at risk of poorer mental health. Specifically, I intend to assess whether singlehood motivations are associated with specific experiences and how (or whether) the diversity within singlehood translates to mental health variance. Considering the lack of research investigating the potential mechanisms that maintain psychological experiences of singles, I intend to analyse to what extent mental health in singlehood can be accounted for by cognitive distortions. Finally, I will evaluate potential exacerbating or buffering effects of social support, locus of control and sexism.

Chapter 2: Diversity of Mental Health Profiles in Singlehood

There are good reasons to expect mental health of singles and those in relationships to differ. From a theoretical angle, we might have an evolutionary predisposition to experience distress when unable to fulfil the main adaptive challenge – reproduction; and because historically, having a partner was crucial for safety and comfort, both of which inevitably affected our mental health (Buss, 1995; Holt-Lunstad, Smith & Layton, 2010). Additionally, singles might be more likely to exhibit psychological traits, e.g., insecure relationships styles (Chopik, Edelstein & Fraley, 2013; Candel & Turliuc, 2019), higher sociosexuality (Gangestad & Simpson, 2000), higher rates of Dark Triad traits (Fernández del Río et al., 2019); and experiences e. g., lower mating performance (Apostolou et al., 2019), past abuse (Swahnberg et al., 2004), experience and perpetration of sexual harassment (Bendixen & Kennair, 2017; Kennair & Bendixen, 2014), which are directly associated with worse mental health. However, past research that aimed to compare mental health of singles *as a whole* with people in relationships has limitations that need to be addressed.

First of all, the prevalent view that single people experience worse psychological (Haring-Hidore et al., 1985; Emery, Horn & Beam, 2012; Wade & Pevalin, 2004) and health outcomes (Dupre & Meadows, 2007; Hughes & Waite, 2009) stems from research that assessed differences between married and non-married people. Yet contemporary studies suggest that when compared with singlehood, even non-marital relationships, such as cohabitation, offer a reduction in rates of depressive symptoms (Brown, 2000) with emerging evidence to suggest that having a partner is beneficial to wellbeing regardless of relationship arrangement (Adamczyk & Segrin, 2015; Chatterjee, Kim, & Chung, 2021). This highlights the problem of using marriage as the default benchmark in relationship research and brings attention to the need for stronger recognition of diversity in this domain (Carr & Springer, 2010), especially considering that non-marital relationships are becoming increasingly more common (House of Commons Library, 2022; Livingston, 2010). When it

comes to research focusing on singlehood specifically – even studies with more rigorous methodology, still tend to overlook, exclude or deem ‘single’ people in committed non-cohabiting relationships, despite such partnerships being associated with outcomes closer to other types of relationships rather than singlehood (Roseneil, 2006; Preetz, 2022; Rapp & Stauder, 2020). Similar considerations need to be acknowledged when looking at wider psychological factors because differences across relationship types are evident in sociosexuality (Penke & Asendorpf, 2008), attachment styles (Mikulincer & Shaver, 2007), abuse (Johnson, 2006), Dark Triad traits (Benfante et al., 2024) just to name a few.

Moreover, the limited research that has examined the relationship between singlehood and mental health through a lens wider than simply comparing it to married individuals, has mainly investigated factors associated with mental health, but not mental health specifically. For example, singlehood has been linked with higher incidence of negative vs. positive emotions (Apostolou et al., 2019), lower life satisfaction (Apostolou et al., 2024; Watkins, Beckmeyer & Jamison, 2024; Oh, Chopik & Lucas, 2022), lower sense of meaning in life and optimism (Apostolou et al., 2024). All of these experiences have well-explored links with wellbeing outcomes and are invaluable for a more nuanced picture of the singlehood experience (Bishop et al., 2011, Jin, He, Li, 2016, Chen et al., 2025). Yet the lack of consensus over singlehood risks to mental wellbeing is unsurprising considering research that investigated more severe outcomes, such as depression or anxiety symptoms, and employed clinical measures is very scarce (Adamczyk, 2017, Adamczyk, 2021, Wongsomboon et al., 2024) or – in the case of mechanisms that could explain these symptoms, e.g., cognitive distortions – absent.

Moreover, investigating singlehood through a homogenising lens is problematic in itself. This is because such approach does not take into account the vast diversity of reasons why people stay single (Apostolou, 2017; Apostolou, Jiaqing & Esposito, 2020), and the

emerging evidence that suggests different singlehood circumstances correspond with different mental health outcomes (Apostolou et al., 2019; Adamczyk et al., 2017). However, these novel studies are already conflicted. For example, in research of life-long singlehood, choice is the determinant that distinguishes whether people feel contentment or regret about never having married or settled for a committed relationship (Timonen, V., & Doyle, 2014). Similarly, voluntary singlehood is associated with better wellbeing outcomes (Apostolou et al., 2024). However, another study found that those who rated freedom of choice the highest were also the least satisfied with being single, suggesting that sometimes people might prioritise other areas of life over being in a relationship even at the cost of personal happiness (Gromkowska-Melosik, Hordecki & Szymczyński, 2022). This ‘split narrative’ is especially intense in popular culture, where living solo seems to be either demonised or glorified (Taylor, 2011; Mollard, 2025).

The above conflict of findings might be due to limitations of methodology. Specifically, the “same” reasons for being single are not necessarily motivated by similar circumstances. For example, someone who chooses to be single to focus on their career might do so to enhance their mating prospects through resource acquisition (Apostolou, et al., 2017), while someone else – to compensate for perceived inadequacies, as demonstrated in research on workaholism (Kun et al., 2020). In quantitative research, both individuals would choose the same answer from the list of options, yet their scores on measures of wellbeing could be very different. This highlights the potential problem with categorising singles based on predesigned factors without the true understanding of heterogeneity within the group. In fact, whilst different domains of singlehood – reasons that cluster together, have been established, there is very limited research that tried to investigate what naturally characterises those different types of singlehood (Apostolou & Esposito, 2020). Considering that accounts

of both positive and negative singlehood exist, it is crucial to, first and foremost, establish how singlehood experiences can be classified.

Although not yet investigated formally, it is worth noticing that singles' descriptions of themselves and their experiences, including reasons for being single, often express patterns of thinking known as cognitive distortions, e.g., labelling themselves as unattractive, making generalised statements like "Men only want one thing" or minimising the importance of closeness altogether. In fact, if singlehood (at least for some) has a negative impact on wellbeing, cognitive distortions, given their strong association with poor mental health, would be expected to influence that effect as well. To date, they have been identified in populations at extreme ends of mating behaviours – incels and sex offenders; both of which hold misjudged and maladaptive beliefs about themselves and those they (want to) mate with. For the first they serve as an explanation of their inability to establish mating opportunities (Costello et al., 2024), the later use them as a justification of committed acts (Blake & Gannon, 2008), yet not much is known about those in the middle – the general population. It seems obvious that the diversity of reasons that people attribute their singlehood to will inevitably correspond with a variety of cognitions and beliefs, however, no research has tried to explore whether it is certain subgroups of singles that are more prone to specific patterns of thinking.

Finally, whilst there is evidence to suggest that singlehood – especially singlehood appraised negatively – is associated with worse mental health outcomes (Kislev, 2025; Beckmeyer, J. J., & Jamison, T. B. 2023; Apostolou et al., 2019; Lehmann et al., 2015) we do not know the extent of this relationship. For example, certain reasons for singlehood might be associated with levels of distress significantly higher than observed in singles who attribute their relationship status to other motivations because – from an evolutionary perspective – not all singlehood circumstances are equally threatening (Apostolou, 2017). Therefore,

establishing which individuals are the most at risk will help understand what shapes singlehood into a positive vs. negative experience. Simultaneously, it might account for some of the conflict in previous findings, i.e., if some singles are significantly more disadvantaged, they are inevitably going to skew the average results of the sample.

It is also necessary to acknowledge that even in research that attempted to assess singles as a heterogeneous group, the inconsistency in findings might be due to response bias. Certain reasons for singlehood are perceived more favourably, e.g., “I have different priorities”, while others are discriminated against, “I am not a desirable mate” (Beauparlant & Machia, 2024) and singles are aware of this discrimination (Morris et al., 2008). The skewed responding is not always intentional as people often adopt new cognitions in order to manage distress associated with cognitive dissonance (McGrath, 2017), i.e., if one’s true reasons for being single are painful to admit to, they might trivialise, rationalise or disregard them altogether and embrace a new perspective of their singlehood. Therefore, in order to meaningfully explore singles’ circumstances, research needs to not only better understand the variance of mental health outcomes across different singlehood types, but also how these potential associations hold when indicators of biased thinking such as cognitive distortions are taken into consideration.

According to the evolutionary perspective, cognitive distortions are erroneously executed adaptive mechanisms (Gilbert, 1998) that we resort to in circumstances, where relying on even otherwise costly mental short-cuts enhances the likelihood of overcoming the ultimate danger (Ayyappan, Carter & Hegdé, 2025, Hertwig & Todd, 2002, Kahneman & Tversky, 1974; Kassam, 2015). Therefore, considering the diversity of adaptive challenges that singles face, some types of singles, for example, those for whom the threat of being single is (felt) more critical than chosen or temporary, might be more likely to experience cognitive distortions and consequentially – more symptoms of mental illbeing. On the other

hand, singles who feel able to establish a relationship or that they are in control of improving their mating prospects, might experience less evolutionary distress and – considering their attitude about their circumstances being more adaptive – less erroneous beliefs.

Predictions

First, I intend to reevaluate the prevailing assumptions in singlehood research by investigating how links with mental health and wider psychological characteristics hold when stricter methodological approach is applied, e.g., any form of romantic and sexual commitment with one person is acknowledged as a relationship. In line with the existing theory that characterises singlehood by a range of distinct psychological experiences, I hypothesize that compared to those in relationships, singles will have worse mental health (Prediction 1a); higher frequency of negative interpersonal experiences (Prediction 1b); lower mating potential (Prediction 1c); more unhealthy interpersonal dynamics (Prediction (1d); higher sociosexuality (Prediction 1e).

So far, attempts to categorise or refine factors contributing to the experience of singlehood have been mixed and inconclusive. Therefore, I take into consideration the need to advance the emerging evidence and predict that there will be sub-categories within singlehood (Prediction 2a), which will be characterised by unique mental health and individual characteristics (2b) as well as different levels of specific cognitive distortions (Prediction 2c).

Finally, I intend to assess the impact that singlehood motivations as well as erroneous patterns of thinking play in the experience of being single and expect that mental health outcomes of single people will be explained by singlehood sub-categories (Prediction 3a) and further mediated by cognitive distortions (Prediction 3b).

Methods

Participants

Prospective participants (18 years and above) were recruited online and through leaflets distributed on the university campus. The study was advertised through the researcher's personal social media, university's research platform as well as using a snowballing sampling method. University participants were awarded participation credits.

The mean age of participants was 24.56 ($SD = 10.03$). Ages ranged from 18 to 77, however, 91% of participants were within 18-35 age, indicating that most of the participants were in their early adulthood. 78.61% of participants were Caucasian/White ($n = 305$), 10.05% were South Asian (Indian, Pakistan, etc.) ($n = 35$), 3.87% were Black ($n = 15$). 156 participants indicated that their gender was male (40.1%), 224 were female (57.58%), and 9 selected 'Other'. 156 participants' biological sex was male (40.1%) and 233 female (59.9%). 78.09% of participants were heterosexual ($n = 303$) and 15.98% were , al ($n = 68$). The majority of participants have completed some college or university 55.78% ($n = 217$), 19.54% of the participants have completed an undergraduate degree ($n = 76$). Most of the participants came from a middle socioeconomic background 50.64% ($n = 197$). The full breakdown of participants' ethnicities, sexual orientation, education and socioeconomic background can be found in Appendix A.

Materials

The demographics form collected information about age, gender, sex, sexual orientation, current relationship status, number of biological children, the highest level of education achieved, ethnicity, how attractive participants considered themselves to be compared to peers, socioeconomic status, and relationship status.

Reasons for Singlehood Questionnaire

Participants who indicated being single were presented with a battery of 10 items outlining different motivations for singlehood. These were inspired by previous research that explored diverse reasons why people remain single, for example, personal choice – voluntary singlehood, as well as constraints – involuntary singlehood (Apostolou, 2017; Apostolou, et al., 2023) and encompassed evolutionary framework proposed by Apostolou (2017) discussing different adaptive circumstances that caused people to be single in the ancestral past. Generated items were also discussed and refined with the main supervisor of this research. Participants were asked to check all the items on the list that they found relevant (i.e., “I am single because...”) and were then instructed to choose the primary reason from the previously selected options (i.e., “Of the reasons below, which is the main reason why you are single?”). The questionnaire also asked whether participants considered themselves involuntary celibate and if they belonged to the incel community. The full list of the reasons for singlehood items can be seen in the table below (see Table 1).

Table 1

Reasons for being single questionnaire

No.	Item
1.	I've had bad experiences in my last relationship.
2.	I'm scared of being hurt.
3.	I'm currently focusing on my career, education, etc.
4.	I want to be free to do whatever I want.
5.	I want to be able to flirt around.
6.	I'm happily single due to other reasons and currently don't want to be in a relationship.

No.	Item
7.	I experience difficulties in attracting a partner.
8.	Although I can attract people, I'm not able to find the right one.
9.	There are other reasons that prevent me from it.
10.	None of the above.

To assess participants' mental wellbeing the Patient Health Questionnaire – 9 (PHQ-9; Kroenke, Spitzer & Williams, 2001), The Generalised Anxiety Disorder – 7 (GAD-7; Spitzer et al., 2007) and Cognitive Distortions Questionnaire - 9-item Short-form (CD-quest-S9; Morrison et al., 2022) were used. Measures can be found in Appendix B and Appendix C in the above order.

Depression

PHQ-9 is a depression severity questionnaire that comprises of 9 items of the DSM-IV Major Depressive Disorder criteria (e.g., “Little pleasure or interest in doing things”), which are scored from 0 (“Not at all”) to 3 (“Nearly every day”). Scores over 10 points are indicative of minor and over 20 points – major depression. In the authors' original study, the reliability of the measure was excellent ($\alpha = .89$). The criterion validity was established in a re-interview study with a healthcare professional, while construct validity was demonstrated through a strong association between study participants' scores and real-life outcomes such as number of disability and sick leave days. Due to its diagnostic utility, PHQ-9 has since been recommended by the NICE guidelines and has been widely used in clinical practice and research with general population samples (NICE, 2009; Cheung, 2024). My internal reliability analysis revealed Cronbach alpha of $\alpha = .88$.

Anxiety

GAD-7 is a measure of anxiety severity that comprises of 7 items based on DSM-IV criteria of Generalised Anxiety Disorder (GAD; e.g., “Feeling nervous, anxious, or on edge”) that are scored from 0 (“Not at all”) to 3 (“Nearly every day”). A score of 10 points is a cutoff point for identifying cases of GAD, whereas 15 points are indicative of severe levels of this disorder. In the authors’ original study, the reliability of the measure was excellent ($\alpha = .92$). Positive relationship between the scores of the measure and self-reported disability rates and day-to-day functional impairment indicated high construct validity of the measure. Procedural validity of the questionnaire was established by comparing the results of the self-administered and mental health practitioner administered scales, which produced an intraclass correlation of $r = .83$. The reliability and validity of GAD-7 have since been replicated in many research studies in clinical and non-clinical populations and proven effective as an online screening tool (Zachar-Tirado & Donders, 2021; Tiirikainen et al., 2019; Hinz et al., 2017; Donker et al. 2011). My internal reliability analysis produced Cronbach alpha of $\alpha = .89$.

Cognitive Distortions

CD-quest-S9 is a short version of the Cognitive Distortions questionnaire (CD-quest; De Oliveira et al., 2015), which aims to capture the intensity and frequency of cognitive distortions experienced. The scale comprises of 9 items, e.g., “Discounting the positive: I disqualify positive experiences or events insisting that they do not count.”. Participants are instructed to indicate how much they believe in (ranging from “No” to “Very much – more than 70%”) and how frequently (ranging from “It did not occur” to “Almost all of the time – 6-7 days in the past week”) they experienced presented cognitive distortions. The total score is calculated using the points’ matrix provided by the authors. In order to replicate the matrix in my study, I have presented participants with examples of cognitive distortions followed by 2 separate scales assessing the intensity and frequency of their experience. CD-quest-S9 has

been demonstrated to have excellent psychometric properties: reliability of $\alpha = .9$ and accuracy of $R^2 = 90.4-93.6\%$ across validation studies in clinical and general population samples (Kaplan et al., 2017; Kostoglou & Pidgeon, 2016). My own internal reliability analysis revealed Cronbach alpha $\alpha = .82$.

To assess participants' frequency of negative interpersonal experiences, adapted versions of Sexual Harassment and Coercion Index (SHCI; Kennair & Bendixen, 2012; Appendix D) and Emotional Abuse Questionnaire (EAQ; Jacobson & Gottman, 1998; Appendix E) were used.

Sexual Harrassment

SHCI comprises of 13-item across 2 scales, which measure experience and engagement in sexual harassment and coercion. Participants are asked to indicate "Yes" (= 1) or "No" (= 0) as to whether in the past year they have been subject to or engaged in behaviours such as "Made denigrating comments such as "whore", "manwhore", "slut", "manslut", "loose", etc.". In the authors' study the harassment scales' internal consistency was above $\alpha = .7$. It has been since successfully utilised in studies with high school samples and young adults, producing reliability scores ranging from $\alpha = .7$ to $\alpha = .85$ (Bendixen & Kennair, 2017; Bendixen et al. 2018; Ribeiro et al., in press). Due to the nature of my study, I have only used items relevant to sexual harassment and not coercion. My internal reliability analysis of being subject to sexual harassment was Cronbach alpha $\alpha = .79$ and engagement in sexual harassment was $\alpha = .74$.

Emotional Abuse

EAQ is a measure of emotional abuse in intimate relationships that comprises of 28 items (e.g., "My partner questions my sanity") scored on a 4-point Likert scale, ranging from 1 - "Never" to 4 - "Very Often". EAQ has been demonstrated to have reliability coefficient as

high as .94 (Celik & Elmaoğlu, 2022) and yielded comparable reliability scores (ranging from $\alpha = .73$ to $\alpha = .93$) in translated versions (Karakurt, Ergüner-Tekinalp & Terzi, 2009). Due to the length and distressing nature of the questionnaire, I only used 6 of the original items – those most indicative of the general amount of turmoil within the relationship. This was done to ensure ethical approval for the study and allowed the subset of items to be precisely relevant to my research questions. The list of items used can be found in the Appendix E. My internal reliability analysis of the adapted EAQ version was $\alpha = .85$.

To assess participants' attitudes towards mating, the Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008; Appendix F) and Mating Performance Scale (MPS; Apostolou, Shialos & Georgiadou, 2019 Appendix G) have been administered.

Sociosexuality

SOI-R is a 9-item measure that assesses 3 facets of sociosexuality: past behavioural experience, attitudes towards uncommitted sex, and sociosexual desire. The behavioural facet includes items such as “With how many different partners have you had sex within the past 12 months?” scored from 1 (“0”) to 9 (“20 or more”), the attitudinal facet includes items such as “Sex without love is OK.” scored from 1 (“Strongly disagree”) to 9 (“Strongly Agree”), and the desire facet, e.g., “How often do you have fantasies about having sex with someone you are not in a committed romantic relationship with?” scored from 1 (“Never”) to 9 (“At least once a day”). Higher total scores are indicative of higher willingness for uncommitted sex. In the authors' study, measure demonstrated high discriminant validity and high overall reliability ($\alpha = .86$). SOI-R has been widely used in sociosexuality research on English-speaking populations, but also successfully utilised and produced comparable evidence of reliability and validity when translated to languages such as Spanish, Portugese, and Chinese

(Gillezeau & Yeater, 2024; Romero et al., 2023; Neto, 2016; Chen et al., 2024). My own internal reliability analysis produced Cronbach alpha $\alpha = .67$.

Mating Performance

MPS is a measure of self-perceived mating performance. It comprises of 5 statements (e.g., “I do well in romantic relationships”) rated on a 5-point Likert scale, ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). The questionnaire's criterion validity was demonstrated through lower scores on MPS being associated with being single and having fewer past relationships. In the authors’ study the reliability of the measure was $\alpha = .81$. It has since been successfully utilised in mating performance research, including a cross-cultural study of 14 nations (Apostolou et al., 2023). My own internal reliability analysis was $\alpha = .72$.

To assess participants’ characteristics of interpersonal dynamics, Experiences in Close Relationship Scale-Short Form (ECR-S; Wei et al., 2007; Appendix G) and The Dirty Dozen (DD; Jonason & Webster, 2010; Appendix H) was used.

Attachment Styles

ECR-S is a short version of the original Experiences in Close Relationships Scale (ECR; Brennan et al., 1998), which is a measure designed to assess adult attachment styles. It comprises of 12 items that evaluate 2 attachment domains – attachment anxiety (e.g., “I need a lot of reassurance that I am loved by my partner.”) and attachment avoidance (e.g., “I try to avoid getting too close to my partner.”), which are scored on a 7 point Likert scale from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). ECR-S has been evaluated as an excellent alternative to the original measure with internal consistency ranging from $\alpha = .77$ to $\alpha = .86$ for the anxiety subscale, and from $\alpha = .78$ to $\alpha = .88$ for the avoidance subscale, across 6 of the authors’ studies. ECR-S is successfully used in relationship research and demonstrates

great psychometric properties in adult and college samples and when translated to other languages (Alonso-Arbiol, 2008; Peng et al., 2021). My own internal reliability analysis revealed Cronbach alpha $\alpha = .74$.

Dark Triad Traits

The DD scale is a 12-item measure of the Dark Triad Traits: narcissism, Machiavellianism, and psychopathy. The statements (e.g., “I tend to manipulate others to get my way”) are scored on a 7-point Likert scale from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). The measure can be used to assess the traits as distinct constructs, but also as a composite score of an exploitative social strategy. In authors’ original studies, DD demonstrated good discriminant and convergent validity, and the average test-retest reliability of $\alpha = .89$. It has been successfully utilised and showed adequate to excellent psychometric properties in research with general public (Jonason & Luévano, 2013), samples characterised by delinquency (Pecchoro et al., 2021) and in translated versions (Czarna et al., 2016). My own internal reliability analysis revealed Cronbach alpha $\alpha = .87$.

Design

My study was of a cross-sectional observational design. The independent variables (IVs) were relationship categories: committed vs. single and the different types of singlehood as expected to emerge in the PCA analysis. The dependent variables (DVs) were scores on measures of depression (PHQ-9), anxiety (GAD-7), cognitive distortions (CD-quest-S9), sociosexuality (SOI-R), attachment anxiety and attachment avoidance (ECRS-S), experience of and perpetration of sexual harassment (SHCI), Dark Triad traits (DD), emotional abuse (EAQ), and mating performance (MPS).

Procedure

The study was conducted online using a research website Qualtrics. Participants accessed the study through the Participant Pool or by entering the link to the study advertised on the researchers' personal social media and participant recruitment forums. They were provided with an information sheet, which debriefed them about the study's aim and if they consented to take part, they were presented with the demographics form followed by all the questionnaires mentioned above in a random order to prevent response bias. Participants who indicated being single were presented with the reasons for singlehood questionnaire, whereas participants who indicated being married or in a committed relationship were asked to assess their current relationship. Due to the sensitive nature of the sexual harassment measure, participants were made aware that they are free to not answer the questions they do not wish to. When responding to the emotional abuse questionnaire, participants who have never been in a committed relationship, or not had an ex-partner were instructed to select "N/A". After finishing the questionnaires, they were presented with the debrief form which explained the rationale behind the study, provided researchers' contact details and information about the support available. Median response time was 23 minutes (IQR = 10 minutes). The research has been approved by the Swansea University's School of Psychology's Research Ethics Committee (Approval Number: 1202381647173). Information sheet, consent form, debrief and the ethical approval for Study 1 can be found in Appendices K-M in the respective order.

Data Analysis Plan

To investigate whether there is a difference between mental health outcomes of participants in relationships and those single, I will use Independent Samples t-tests. The Independent Variables (IVs) will be relationship statuses – in a committed relationship vs. single. The Dependent Variables (DVs) will be measures mentioned in the Materials section. Before proceeding with the tests, data of each of the analyses will be checked against the

assumptions of normality and homogeneity. This will be done using Q-Q plots of residuals and Levene's tests. If the assumptions are violated, I will conduct Welch's t-tests, which do not assume the homogeneity of variance.

To investigate whether there are subgroups amongst singles, Principal Components Analysis (PCA) will be conducted on participant responses to the reasons for singlehood list. To assess whether my data is suitable for this analysis, Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity will be performed. Number of Principal Components extracted will be determined by referring to the Scree Plot and only if the Eigenvalue is greater than 1. The threshold of at least .4 will be used as an indicator of the component meaningfully loading onto a factor.

To investigate mental health profiles of the emerged singlehood categories and those in relationships I will conduct series of the Analysis of Covariance (ANCOVA) tests. The IVs will be the singlehood categories and DVs will be measures mentioned in the Materials section. Sex and age will be included as covariates in the model. This is to control for their previously identified significant association with depression, anxiety and the expected influence on the broader factors within the interpersonal domain (Thompson et al., 2021; Antonucci & Akiyama, 1987). The assumptions of normality and homogeneity will be checked prior to conducting these tests. Bonferroni correction will be applied to control for the Type 1 error due to multiple comparisons.

To investigate whether the emerged singlehood categories (IVs) help explain the variance in mental health outcomes multiple linear regression analyses will be conducted. The DVs will be depression and anxiety scores. Cognitive distortions will be included in the model as an IV to assess their potential influence as a mediator. Before proceeding with regression analyses, multicollinearity will be assessed in addition to already checked

assumptions of normality and homogeneity. This will be done by calculating the Variance Inflation Factor (VIF). Dummy coding will be applied so that the intercept represents participants in committed relationships.

Results

The survey was completed by 409 participants. Data of 20 participants had to be removed due to their completion time being shorter than 5 minutes or longer than 1 hour, meaning it fell beyond the predefined inclusion criteria. Therefore, data of 389 respondents was used for the analysis.

Data from participants who indicated being in an uncommitted relationship ($n = 13$) or Other ($n = 1$) was omitted, as their relationship status was considered distinct from other categories, but the samples were not big enough for meaningful comparisons. Therefore, in the subsequent analyses data of 3 categories – married ($n = 40$), in a committed relationship ($n = 155$), and single ($n = 180$) was used. Participants who stated that they were married ($n = 40$) or in a committed relationship ($n = 155$) were grouped together as “Committed” ($n = 195$). These categories were merged because both assume romantic and sexual commitment to one partner, which makes them functionally equivalent and because relationships without marriage are currently the most common form of cohabiting relationships (ONS, 2023). Scores of dependent variable measures (see Materials section) were calculated in accordance with the guidelines provided by the authors of the questionnaires.

The assumptions of the tests and suitability of the data were assessed in the way outlined in the Data Analysis Plan. The results of these tests can be found in the Appendix S (Tables S1-S5 and Figures S1-S4)

Prediction 1a: Compared to Those in Relationships, Singles Will Have Worse Mental Health

Descriptive statistics of participants in committed relationships and single, and their scores on measures of depression, anxiety and cognitive distortions can be found in the table below (see Table 2). It is worth noting that the mean score of single participants on the measure of depression (PHQ-9) was slightly higher than 10 points, which in clinical practice serves as the screening threshold for minor depression and warrants further evaluation and intervention (PHQ-9; Kroenke, Spitzer & Williams, 2001). The mean score of neither single nor those in committed relationships reached the clinical cut-off of 10 points on the measure of anxiety (GAD-7), which is used for identifying the generalised anxiety disorder (GAD-7; Spitzer et al., 2007). Comparable variability of scores (as seen in the standard deviation estimates) suggests that both singles and those in relationships were characterised by a similar range of experiences.

Despite singles scoring higher on all 3 measures, Independent Samples t-tests found no significant relationship between relationship status and depression, $t(373) = -1.53, p = .127, d = -.16, CI [-2.33, .29]$; anxiety, $t(373) = -.61, p = .545, d = .06, CI [-1.44, .76]$; or cognitive distortions, $t(373) = -1.4, p = .162, d = -.15, CI [-4.82, .81]$. This suggests that levels of depression and anxiety symptoms and cognitive distortions levels do not significantly differ between those in a relationship versus currently single.

Prediction 1b: Compared to Those in Relationships, Singles Will Have a Higher Frequency of Negative Interpersonal Experiences

Descriptive statistics of participants in committed relationships and single, and their scores on measures of experience and perpetration of sexual harassment, and measure of emotional abuse can be found in the table below (see Table 2). Single participants scored higher than participants in committed relationships on measures of experience of sexual harassment as well as perpetration of sexual harassment, but lower on the emotional abuse questionnaire. Due to using modified versions of the questionnaires and limited literature in

the area it is difficult to compare my findings, however, it is worth noticing, that high variability of scores on both scales of sexual harassment, indicates that while some participants did not experience or perpetrate sexual harassment at all, some experienced it at levels twice the mean.

Independent Samples t-tests revealed a significant relationship between relationship status and measure of the experience of sexual harassment, $t(373) = -3.86, p = < .001, d = -.4, CI [-1.43, -.47]$ with those in relationships reporting being subject to sexual harassment less than those who were single. However, no significant relationship was observed between relationship status and perpetration of sexual harassment, $t(373) = -.84, p = .403, d = -.09, CI [-.55, .22]$. Welch's t-test revealed no significant relationship between relationship status and emotional abuse, $t(270.87) = 1.63, p = .105, d = .19, CI [-.32, 2.88]$. These findings suggest that those currently single are subject to more sexual harassment than those in relationships, however, both groups engage in comparable levels of sexual harassment and experience similar levels of emotional abuse.

Prediction 1c: Compared to Those in Relationships, Singles Will Have Lower Mating Potential and Higher Sociosexuality

Descriptive statistics of participants in committed relationships and single, and their scores on measures of mating performance and sociosexuality can be found in the table below (see Table 2). The mean score of singles' mating performance was lower, whilst sociosexuality higher than the mean score of participants' in committed relationships, which was in line with previous research in the area (Apostolou et al., 2023; Rodrigues & Lopes, 2017). Standard deviations of the two samples' scores across both measures suggest similarity in the range of experiences.

Independent Samples t-test confirmed a significant difference between relationship status and mating performance, $t(373) = 9.94, p < .001, d = 1.03, CI [2.79, 4.17]$ with people in relationships scoring higher than those single. Similarly, Welch's t-test revealed a significant relationship between relationship status and sociosexuality, $t(348.61) = -5.23, p < .001, d = -.54, CI [-1.18, -.54]$ with people who are currently single reporting higher levels of sociosexuality than those in relationships. These results suggest that single people self-report lower mating performance, but higher sociosexuality compared to people currently in committed relationships.

Prediction 1d: Compared to Those in Relationships, Singles Will Have More Unhealthy Interpersonal Dynamics

Descriptive statistics of participants' in committed relationships and single and their scores on measures of Dark Triad traits and attachment anxiety and attachment avoidance can be found in the table below (see Table 2). Mean scores of single participants were higher than scores of participants in committed relationships on measures of Dark Triad traits, attachment anxiety, and attachment avoidance. My findings were in line with past literature, which suggests that people in committed relationships exhibit lower levels of dark personality traits such as Machiavellianism, narcissism and psychopathy (Benfante et al. 2024) and are characterised by secure attachment styles rather than attachment anxiety or avoidance that is more prominent in single individuals (Kirkpatrick & Hazan, 1994).

Despite the above results, the Independent Samples t-test found no significant relationship between relationship status and Dark Triad traits, $t(373) = -1.35, p = .179, d = 1.14, CI [-4.45, .83]$. However, significant relationships were observed between relationship status and attachment anxiety, $t(373) = -8.83, p < .001, d = -.91, CI [-7.35, -4.67]$ and attachment avoidance, $t(373) = -8.98, p < .001, d = .11, CI [-7.36, -4.72]$ with people who are

currently single reporting higher levels of both attachment anxiety and attachment avoidance than participants in relationships. These results suggest that both singles and people in relationships exhibit comparable levels of the Dark Triad traits, i.e., Machiavellianism, psychopathy and narcissism, but single people experience markedly higher levels of relational anxiety and avoidance.

Table 2

Measure	Committed			Single		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Depression	195	8.99	6.48	180	10.01	6.39
Anxiety	195	8.17	5.51	180	8.51	5.29
Cognitive Distortions	195	23.06	13.09	180	25.7	13.79
Experience of Sexual Harassment	195	2.39	2.3	180	3.33	2.47
Perpetration of Sexual Harassment	195	1.57	1.87	180	1.74	1.94
Emotional Abuse*	156	14.3	7.23	118	13.02	5.83
Mating Performance	195	16.84	3.4	180	13.36	3.37
Sociosexuality	195	3.27	1.43	180	4.13	1.43
Dark Triad	195	36.22	13.04	180	38.02	12.92
Attachment Anxiety	195	13.43	6.31	180	19.45	6.88

Measure	Committed			Single		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Attachment	195	13.38	6.28	180	19.42	6.75
Avoidance						

Descriptive statistics of participants' in committed relationships and those single scores on measures of depression, anxiety, and cognitive distortions

*Note *Please refer to Procedure section for more information on lower participant numbers on measure of Emotional Abuse.*

Prediction 2a: There Are Subcategories Within Singlehood

A battery of items was administered to assess participants' reasons for being single. First, participants were instructed to select items that they found relevant to their singlehood and then to choose the top reason from the previously selected options. The most frequently selected option was "8. *Although I can attract people, I'm not able to find the right one.*", followed by "3. *I'm currently focusing on my career, education, etc.*" and "4. *I want to be free to do whatever I want.*" For the main reasons for being single, top responses were split between option 3 and 8. Reason 4 and "1. *I've had bad experiences in my last relationship.*" ranked second, and "6. *I'm happily single due to other reasons and currently don't want to be in a relationship.*" was the third most reported main reason. Interestingly, no one selected "5. *I want to be able to flirt around.*" as their top reason for being single. The frequency table can be seen below (see Table 3).

Table 3

Frequencies of participants' reasons for being single

Reason	Selection frequency overall	Top reason overall
1. I've had bad experiences in my last relationship.	10.26%	11.54%
2. I'm scared of being hurt.	11.3%	8.79%
3. I'm currently focusing on my career, education, etc.	18.78%	23.08%
4. I want to be free to do whatever I want.	15.48%	11.54%
5. I want to be able to flirt around.	6.43%	0%
6. I'm happily single due to other reasons and currently don't want to be in a relationship.	9.91%	10.44%
7. I experience difficulties in attracting a partner.	5.22%	7.14%
8. Although I can attract people, I'm not able to find the right one.	18.96%	23.08%
9. There are other reasons that prevent me from it.	3.65%	4.4%

To investigate whether singlehood items cluster into categories, PCA analysis was performed on the data of reasons for being single. Item 9 from the above list was omitted due to not providing sufficient information to be interpretable. Sample size to item ratio was considered adequate based on rules of thumb of minimum 5-20 items per variable and a total sample of at least 100-200 participants suggested in past research (Hair et al., 2018; MacCallum et al., 1999). Oblimin rotation was applied on tetrachoric correlations matrix, which was necessary due to the use of binary data. The Kaiser-Meyer-Olkin (KMO) was .45 indicating poor sampling adequacy, which was potentially a result of using binary data as well. However, considering it was approaching the minimum acceptable threshold .5 (Tausch, 2024; Inquilla-Mamani, 2019) and as our Bartlett's Test was significant $\chi^2(28) = 192.05, p$

<.001, indicating that the correlations between variables were strong enough to justify the use of PCA, we proceeded with the analysis. 3 categories have emerged, which can be seen in the Table 4 below. First, named ‘Single due to Interpersonal Issues’ included items 1, 2, 7 and explained 18% of variance. Second, was named ‘Single for Freedom’ included items 4 and 5 and explained 18% of variance. Third, was named ‘Single by Choice’ and included items 3, 6 and 8, which explained 16%. Due to statistical limitations discussed above, I would like to stress that my results serve an exploratory function, with the emerged factors considered preliminary and requiring further validation.

Table 4

Results of the PCA of the reasons for being single

Reasons	Single due to Interpersonal Problems	Single for Freedom	Single by Choice
I’m scared of being hurt (2)	.78		
I’ve had bad experiences in my last relationship (1)	.63		
I experience difficulties in attracting a partner (7)	.51		
I want to be able to flirt around (5)		.85	
I want to be free to do whatever I want (4)		.82	
I’m currently focusing on my career, education, etc. (3)			.79
Although I can attract people, I’m not able to find the right one (8)			.53

Reasons	Single due to Interpersonal Problems	Single for Freedom	Single by Choice
I'm happily single due to other reasons and currently don't want to be in a relationship (6)			.42
Eigenvalue	1.53	1.43	1.82
Proportion Variance (%)	18	18	16
Cumulative (%)	18	36	52

Prediction 2b: Different Singlehood Types Will Be Characterised by Different Mental Health Outcomes Compared to Those in Relationships

Participants were allocated to 3 singlehood type categories based on their selection of the primary reason for being single: Single due to Interpersonal Problems ($n = 50$), Single for Freedom ($n = 21$), Single by Choice ($n = 97$).

Descriptive statistics of participants in committed relationships and single due to interpersonal problems, single by choice, single for freedom scores on measures of dependent variables (see Materials) can be found in the table below (see Table 5). There appeared to be some differences between the groups. For example, single due to interpersonal problems indicated the most emotional turmoil, whereas singlehood for freedom was characterised by the highest level of unhealthy and maladaptive interpersonal dynamics. Singlehood by choice indicated more positive psychological outcomes when compared to other singles, but overall, being in a committed relationship was associated with the least psychological distress and better relational outcomes than being single regardless of the singlehood type. Comparable

standard deviations across groups on all measures suggest similarity in variance of experience.

Table 5

Descriptive statistics of relationship categories on measures of depression, anxiety, cognitive distortions, experience of and perpetration of sexual harassment, emotional abuse, mating performance, sociosexuality, Dark Triad traits, attachment anxiety and attachment avoidance

Measure	Single due to		Single by Choice		Single for		In a relationship	
	Interpersonal Problems				Freedom			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Depression	13.04	6.38	8.88	5.73	7.76	5.93	8.99	6.48
Anxiety	10.35	6.16	7.73	4.72	7.68	4.42	8.17	5.51
Cognitive Distortions	29.04	14.77	22.85	13.56	22.33	10.38	23.06	13.9
Experience of Sexual Harassment	3.14	2.55	3.27	2.39	3.81	2.58	2.39	2.29
Perpetration of Sexual Harassment	1.62	1.91	1.63	1.87	2.43	2.36	1.57	1.87
Emotional Abuse	16.36	6.4	12.25	5.1	9.31	4.54	14.3	7.23

Measure	Single due to				Single for		In a relationship	
	Interpersonal Problems		Single by Choice		Freedom			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mating Performance	12.9	3.45	13.34	3.57	14.52	2.56	16.84	3.4
Sociosexuality	4.02	1.44	3.98	1.83	4.92	1.59	3.27	1.43
Dark Triad Traits	38.26	14.23	37.75	12.53	39.24	2.67	36.22	13.04
Attachment Anxiety	19.43	6.98	19.26	7.15	19.52	5.78	13.43	6.31
Attachment Avoidance	19.22	6.89	19.26	6.98	19.52	5.78	13.38	6.28

Series of ANCOVA tests were conducted to explore the variance of personality traits and individual differences between participants in committed relationships, participants single due to interpersonal problems, and participants single by choice. Sex and age were included as covariates in order to control for their potential effects and to distinguish the effects specific to relationship categories. Single for Freedom category was not used in these analyses due to the insufficient number of participants to draw firm conclusions ($n = 21$).

Depression, Anxiety and Cognitive Distortions

There was a significant difference in the depression levels between 3 groups (see Table 6). The mean score of participants single due to interpersonal problems was significantly higher than the mean score of participants in committed relationships ($p < .001$).

and participants single by Choice ($p = .004$). However, there was no significant difference between participants single by choice and participants in committed relationships ($p = .425$).

There was a significant difference in the anxiety levels between 3 groups (see Table 6). The mean score of participants single due to interpersonal problems was significantly higher than the mean score of participants single by choice ($p = .005$). However, there was no significant difference between participants in committed relationships and single by choice ($p = .228$) and single due to interpersonal problems ($p = .137$).

There was a significant difference in the total level of cognitive distortions between 3 categories (see Table 6). The mean score of participants single due to interpersonal problems was significantly higher than participants' single by choice ($p = .011$). However, there was no significant difference between the total levels of cognitive distortions of participants in committed relationships and those single by choice ($p = .313$) and single due to interpersonal problems ($p = .192$).

Sexual Harassment and Emotional Abuse

ANCOVA indicated no significant difference in the sexual harassment levels 3 groups have been subject to or have engaged in (Table 6). However, there was a significant difference in the levels of experience of emotional abuse between the 3 groups (see Table 6). The mean score of participants single due to interpersonal problems was significantly higher than the mean score of participants single by choice ($p = .005$) who also scored significantly lower than the mean score of participants in relationships ($p = .007$). There was no significant difference between participants in committed relationships and participants single due to interpersonal problems ($p = .066$).

Mating Performance and Sociosexuality

There was a significant difference between the 3 groups' scores of mating performance (see Table 6). The mean score of participants in committed relationships was significantly higher than mean score of participants single due to problems ($p < .001$) and participants single by choice ($p < .001$). There was no significant difference between the mean score of participants single by choice and participants single due to interpersonal problems ($p = 1$).

The results indicated a significant difference in the levels of sociosexuality between the 3 groups (see Table 6). The mean score of participants in committed relationships was significantly lower than participants single by choice ($p = .007$). However, there was no significant difference between the scores of participants single due to interpersonal problems and single by choice ($p = 1$) and in relationships ($p = .08$).

Dark Triad Traits, Attachment Anxiety and Attachment Avoidance

There was no significant difference between the 3 categories scores of Dark Triad traits (see Table 6).

There was a significant difference between the 3 categories scores on the attachment anxiety (Table 6). The mean score of participants in committed relationships was significantly lower than participants single by choice ($p < .001$) and single due to interpersonal problems ($p < .001$). There was no significant difference between participants single by choice and participants single due to problems ($p = 1$).

There was a significant difference between the 3 categories' scores on attachment avoidance (Table 6). The mean score of participants in committed relationships was significantly lower than the mean score of participants single by choice ($p < .001$) and participants single due to problems ($p < .001$). However, there was no significant difference

between participants single due to interpersonal problems and participants single by choice ($p = 1$).

Table 6

ANCOVA results of relationship categories on measures of depression, anxiety, cognitive distortions, experience and perpetration of sexual harassment, emotional abuse, mating performance, sociosexuality, Dark Triad traits, attachment anxiety and attachment avoidance

Measure	Cases	SS	df	Mean Square	F	p	η^2
Depression	Relationship categories	605.66	2	302.83	8.45	< .001	.04
	Sex	129.71	1	129.71	3.62	.058	.01
	Age	890.04	1	890.04	24.84	< .001	.07
	Residuals	12076.58	337	35.84			
Anxiety	Relationship categories	270.37	2	135.18	5.14	.006	.03
	Sex	404.85	1	404.85	15.39	< .001	.04
	Age	413.97	1	413.87	15.732	< .001	.228
	Residuals	8866	337	26.31			
Cognitive distortions	Relationship categories	1478.22	2	739.11	4.37	.013	.02
	Sex	1928.06	1	1928.06	11.39	< .001	.03
	Age	5186.6	1	5186.6	30.64	< .001	.08
	Residuals	65827.86	337	194.18			

Measure	Cases	<i>SS</i>	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	η^2
Experience of sexual harassment	Relationship categories	13.6	2	6.8	1.34	.26	.01
	Sex	.63	1	.63	.13	.72	< .001
	Age	159.96	1	159.96	31.46	< .001	.09
	Residuals	1713.27	337	5.08			
Perpetration of sexual harassment	Relationship categories	6.09	2	3.04	.96	.39	.01
	Sex	33.61	1	33.61	10.55	.001	.03
	Age	87.14	1	87.14	27.36	< .001	.07
	Residuals	1073.2	337	3.19			
Emotional abuse*	Relationship categories	558.22	2	279.11	6.88	.001	.05
	Sex	227.22	1	227.22	5.6	.02	.02
	Age	441.98	1	441.98	10.9	.001	.04
	Residuals	10180.21	251	40.56			
Mating performance	Relationship categories	1083.82	2	541.91	46.73	< .001	.22
	Sex	1	1	1	.09	.77	< .001
	Age	10.03	1	10.03	.87	.35	.002
	Residuals	3908.19	337	11.6			
Sociosexuality*	Relationship categories	25.69	2	12.85	5.62	.004	.03
	Sex	42.63	1	42.63	18.65	< .001	.05

Measure	Cases	SS	df	Mean Square	F	p	η^2
	Age	14.93	1	14.94	6.53	.011	.017
	Residuals	819.63	122.62	6.68			
	Relationship categories	8.66	2	4.33	.03	.974	< .001
Dark Triad	Sex	473.03	1	473.03	2.93	.09	.01
	Age	3407.75	1	3407.75	21.08	< .001	.06
	Residuals	54488.84	337	161.69	21.08	< .001	.06
	Relationship categories	2699.85	2	1349.93	30.33	< .001	.16
Attachment Anxiety	Sex	3.92	1	3.92	.09	.767	< .001
	Age	2.78	1	2.78	.06	.803	< .001
	Residuals	15001.32	337	44.51			
	Relationship categories	2692.24	2	1346.12	30.97	< .001	.16
Attachment Avoidance	Sex	15.97	1	15.97	.37	.55	< .001
	Age	3.61	1	3.61	.08	.77	< .001
	Residuals	14649.64	337	43.47			

Note. *Violated assumption of equal variances

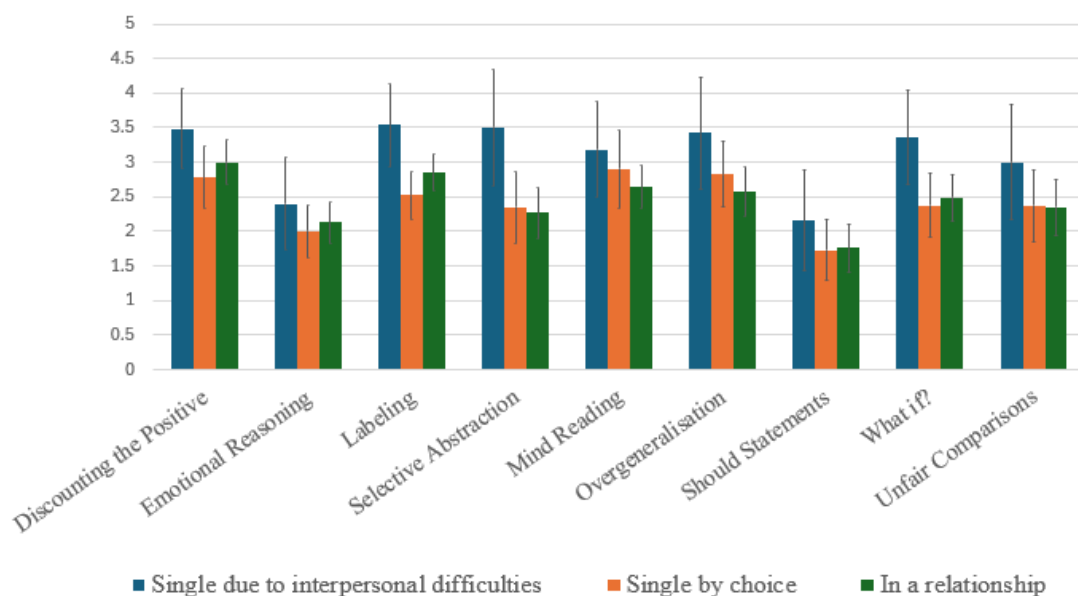
Prediction 2c: Different Singlehood Types Will Be Characterised by Different Levels of Individual Cognitive Distortions

Descriptive statistics of participants in committed relationships and single due to interpersonal problems and single by choice scores on individual cognitive distortion items

can be found in the Figure below (see Figure 1). The results indicate that participants single due to interpersonal problems experienced the most of every type of cognitive distortion. Participants in relationships had the second highest score on cognitive distortions 1, 2, 3, 7 and 8, whereas single by choice scored higher on 4, 5, 6 and 9. These results suggest that being single due to interpersonal problems is associated with the highest incidence of cognitive distortions overall. However, there was a lot of variability across all categories and individual distortions, which indicates that while some participants experienced almost no cognitive distortions, some experienced twice the average.

Figure 1

Means and 95% Confidence Intervals of individual cognitive distortions (CD-quest-S9 items)



Series of ANOVA tests were conducted to explore the variance of individual cognitive distortions between participants in committed relationships, participants single due to problems, and participants single by choice. Significant differences between 3 categories

emerged only on three individual items: *Labelling*, *Selective Abstraction*, *What if?* (See Table 7).

Labelling

There was a significant difference between the levels of *Labelling* across 3 singlehood categories (Table 7). The mean score of participants single due to interpersonal problems ($M = 3.54$, $SD = 2.16$) was significantly higher than the mean score of participants single by choice ($M = 2.52$, $SD = 1.74$), $p = .005$. However, there was no significant difference between participants in committed relationships ($M = 2.85$, $SD = 1.9$) and participants single by choice or due to interpersonal problems.

Selective Abstraction

There was a significant difference between the levels of *Selective Abstraction* across 3 singlehood categories (Table 7). The mean score of participants single due to interpersonal problems ($M = 3.5$, $SD = 3.03$) was significantly higher than the mean score of participants in committed relationships ($M = 2.35$, $SD = 2.64$), $p = .024$. However, there was no significant difference between participants in committed relationships and participants single by choice or due to interpersonal problems.

What if?

There was a significant difference between the levels of *What if?* across 3 singlehood categories (Table 7). The mean score of participants single due to interpersonal problems ($M = 3.36$, $SD = 2.44$) was significantly higher than the mean score of participants single by choice ($M = 2.37$, $SD = 2.32$), $p = .025$. However, there was no significant difference between participants in committed relationships and single by choice and due to interpersonal problems.

Table 7

ANCOVA results of relationship categories scores of the 9 cognitive distortions from the CD-quest-S9

	Cases	SS	df	Mean Square	F	p	η^2
<i>Discounting the positive</i>	Relationship categories	25	2	12.5	2.68	.07	.02
	Age	97.99	1	97.99	21.01	< .001	.06
	Sex	17.54	1	17.54	3.76	.05	.01
	Residuals	1571.5	337	4.66			
<i>Emotional Reasoning</i>	Relationship categories	8.04	2	4.02	.91	.4	.005
	Age	2.44	1	2.44	.55	.46	.002
	Sex	58.25	1	58.25	13.22	< .001	.04
	Residuals	1485.3	337	4.41			
<i>Labeling</i>	Relationship categories	38.17	2	19.08	5.49	.005	.03
	Age	33.62	1	33.62	9.66	.002	.03
	Sex	3.75	1	3.75	1.08	.3	.003
	Residuals	1172.2	337	3.48			
<i>Selective Abstraction*</i>	Relationship categories	49.58	2	24.79	3.67	.026	.02
	Age	92.23	1	92.23	13.66	< .001	.04

	Cases	SS	df	Mean Square	F	p	η^2
	Sex	29.54	1	29.54	4.37	.037	.01
	Residuals	2275.7	337	6.75			
	Relationship categories	5.22	2	2.61	.55	.577	.003
<i>Mind reading</i>	Age	53.6	1	53.6	11.31	< .001	.03
	Sex	43.02	1	43.02	9.07	.003	.03
	Residuals	1597.8	337	4.74			
	Relationship categories	20.52	2	10.26	1.64	.195	.01
<i>Overgeneralisation</i>	Age	35.31	1	35.31	5.65	.02	.02
	Sex	54.67	1	54.67	8.75	.003	.03
	Residuals	2105.1	337	6.25			
	Relationship categories	8.13	2	4.06	.69	.498	.004
<i>Should statements</i>	Age	73.1	1	73.1	12.57	< .001	.04
	Sex	.1	1	.1	.02	.897	< .001
	Residuals	1959.6	337	5.82			
	Relationship categories	37.55	2	18.78	3.6	.028	.02
<i>What if?</i>	Age	99.19	1	99.19	19.02	< .001	.05
	Sex	37.66	1	37.66	7.22	.008	.02
	Residuals	1757.9	337	5.22			

	Cases	SS	df	Mean Square	F	p	η^2
<i>Unfair Comparisons*</i>	Relationship categories	18.43	2	9.21	1.28	.279	.08
	Age	179.13	1	179.13	24.88	< .001	.07
	Sex	24.42	1	24.42	3.39	.067	.01
	Residuals	2426.1	337	7.2			

Note. *Violated assumption of equal variances

Prediction 3a: Mental Health Outcomes Will Be Significantly Predicted by Singlehood Types and the Relationship Between Mental Health Outcomes and Singlehood Categories Will Be Significantly Explained by Cognitive Distortions

Depression

Step 1. The overall model was significant and indicated that singlehood categories explained 5% ($R^2 = .05$) of the variance in PHQ scores, $F(2, 386) = 9.06, p < .001$. Being single due to interpersonal problems was a significant predictor of depression levels, $B = 4.01, SE = .98, p < .001$, suggesting those who were single due to interpersonal problems experienced higher frequency of depression symptoms, as indicated by a 4.01- point increase on the PHQ scale. Being single by choice was not a significant predictor of depression levels, $B = .15, SE = .76, p = .845$. The results suggest that a small proportion of variance in depression severity as measured by the PHQ scale can be significantly explained by singlehood categories, however, being single by choice is not a significant predictor when compared with singlehood due to interpersonal problems. The results of individual predictors can be seen below (see Table 8).

Step 2. To assess the impact of cognitive distortions on the relationship between singlehood categories and depression severity, a hierarchical multiple regression was conducted. The overall model was significant and suggested that singlehood categories and cognitive distortions levels explained 34% ($R^2 = .34$) of the variance in PHQ scores, $F(3, 385) = 65.01, p < .001$. The addition of cognitive distortions resulted in a significant increase in explained variance, $\Delta R^2 = .3, F(1, 383) = 171.26, p < .001$. Being single due to interpersonal problems was still a significant predictor of depression levels, $B = 2.61, SE = .82, p = .002$, suggesting those single due to interpersonal problems experience higher frequency of depression symptoms as indicated by a 2.61-point increase on the PHQ scale. Being single by choice was not a significant predictor, $B = .02, SE = .63, \beta = .001, p = .973$. Cognitive distortions were a significant predictor of depression levels, $B = .25, SE = .02, \beta = .55, p < .001$, as indicated by a .25-point increase on the PHQ scale. The results suggest that variance in depression severity can be significantly explained by singlehood categories and cognitive distortions. Being single due to interpersonal problems and cognitive distortions are significant predictors of higher depression severity, however, being single by choice is not a significant predictor when compared with other independent variables included in the model. It is important to note, that after the inclusion of cognitive distortions in *Step 2* the regression coefficient of singlehood due to interpersonal problems remained significant but decreased from $B = 4.01$ to $B = 2.61$, which suggests that this category of singles experiences higher levels of depression than those in committed relationships regardless of their cognitive distortion levels. The results of individual predictors can be seen in the table below (see Table 8).

Table 8

Hierarchical Regression Results for Depression

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
Step 1						.05	.04*
Intercept	9.03	8.22	9.82	.4			
Single due to interpersonal problems	4.01**	2.08	5.95	.98			
Single by choice	-.15	-1.65	1.35	.76			
Step 2						.34	.34**
Intercept	2.97	1.85	4.1	.6			
Single due to interpersonal problems	2.61**	1	4.24	.82			
Single by choice	.02	-1.26	1.24	.63			
Cognitive Distortions	.25**	.22	.3	.02	.55		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$; ** $p < .001$;

Anxiety

Step 1. The overall model was significant and indicated that singlehood categories explained 2% ($R^2 = .02$) of the variance in GAD scores, $F(2, 386) = 4.3, p = .014$. Being single due to interpersonal problems was a significant predictor of anxiety levels, $B = 2.2, SE = .83, p = .008$, as indicated by a 2.2-point increase on the GAD scale. Being single by choice

was not a significant predictor of anxiety levels, $B = -.42$, $SE = .64$, $p = .517$. The results suggest that a small proportion of variance in anxiety severity can be significantly explained by singlehood categories, however, being single by choice is not a significant predictor when compared with singlehood due to interpersonal problems. The results of individual predictors can be seen in the table below (see Table 9).

Step 2. To assess the impact of cognitive distortions on the relationship between singlehood categories and anxiety severity, a hierarchical multiple regression was conducted. The overall model was significant and suggested that singlehood categories and cognitive distortions levels explained 34% ($R^2 = .34$) of the variance in GAD scores, $F(3, 385) = 66.26$, $p < .001$. The addition of cognitive distortions resulted in a significant increase in explained variance, $\Delta R^2 = .32$, $F(1, 382) = 184.85$, $p < .001$. Being single due to interpersonal problems was no longer a significant predictor of anxiety levels, $B = .97$, $SE = .69$, $p = .16$. This suggests that the effect of this variable observed in Step 1 was fully statistically accounted by cognitive distortions, which emerged as a significant predictor too, $B = .22$, $SE = .02$, $\beta = .57$, $p < .001$, as indicated by a .23-point increase on the GAD-7 scale. Being single by choice was not a significant predictor of anxiety levels, $B = -.27$, $SE = .53$, $p = .611$. The results suggest that variance in anxiety severity as measured by the GAD-7 scale can be significantly explained by singlehood categories and cognitive distortions. However, the initial effect of singlehood due to interpersonal problems is no longer significant when cognitive distortions are introduced as a subsequent predictor. These results suggest that the association between singlehood due to interpersonal problems and anxiety levels might be because those who are single for those reasons experience more cognitive distortions, which are in turn related to higher anxiety levels. The results of individual predictors can be seen in the table below (see Table 9).

Table 9*Hierarchical Regression Results for Anxiety*

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		<i>LL</i>	<i>UL</i>				
Step 1						0.2	.02**
Intercept	8.14	7.46	8.83	.35			
Single due to interpersonal problems	2.25**	.59	3.91	.85			
Single by choice	-.42	-1.7	.86	.65			
Step 2						.34	.34**
Intercept	2.88	1.93	3.82	.48			
Single due to interpersonal problems	1.02	-.36	2.4	.7			
Single by choice	-.24	-1.29	.82	.53			
Cognitive Distortions	.22**	.19	.26	.02	.57		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; **p* < .05. ***p* < .001;

Discussion

This study investigated differences in mental health outcomes and broader individual characteristics and experiences of people in relationships and those currently single.

Prediction 1a was not supported as mental health of singles was comparable to those in

relationships. However, the groups differed significantly in terms of their interpersonal experiences and dynamics, which supported prediction 1b-1d. Predictions 2a-2c were also confirmed as 3 singlehood sub-groups emerged based on reasons for being single, and were defined by distinct group-specific characteristics. Finally, my findings supported Prediction 3a and 3b as mental health outcomes were significantly explained by singlehood categories and the relationship between these factors was influenced by cognitive distortions. I will now examine the results in more detail.

Singlehood vs. Relationships

Contrary to my prediction, there was no statistical difference between singles and those in relationships on measures of depression and anxiety. This is not in line with past literature which identified singles as having higher incidence of these mental health conditions and in general – higher frequency of associated negative emotions, e.g., sadness, guilt, and lower levels of happiness overall (Schachner, Shaver & Gillath, 2008; Apostolou et al., 2019). I have also observed no significant difference between the two groups in their levels of cognitive distortions. My results support the emerging recognition that the relationship between wellbeing and singlehood might be driven by specific circumstances rather than the absence of a partner in itself (Adamczyk, 2017; Adamczyk & Segrin, 2015) and therefore comparing committed individual to those currently single as a homogenous group is not able to capture those nuanced effects.

In line with previously identified general population trends as well as specific contexts, e.g., workplaces (Jackson & Newman, 2004; Brottsförebyggande rådet [BRÅ], 2017b), I found that single individuals reported having experienced more sexual harassment. Although past research focused mainly on female sexual harassment (Byrne, 2000) and compared those without a partner with married individuals (Merkin, 2012; Lee, Heilmann &

Near, 2004) some evidence suggests that characteristics of male victims of sexual violence are similar to female and include marital status, i.e., it is more prevalent in single individuals (Choudhary, Coben & Bossarte, 2010). In this study, I compared single individuals and those in any form of committed relationship with one person, which strengthens the above notion that singlehood is a vulnerability criterion for sexual harassment regardless of gender and that even non-marital relationships offer a level of protection unavailable to those without a partner. However, it is important to keep in mind that these findings might be in part due to singles being more likely to visit environments, where sexual harassment is more common, such as night clubs (Quigg et al., 2020).

Being single is associated with higher lifetime incidence of all forms of abuse (Swahnberg et al., 2004), whereas emotional abuse is one of the most prevalent forms of intimate partner violence (Karakurt & Silver, 2013), yet I found no difference in its levels in singles compared to those in relationships. There was also no difference in perpetration of sexual harassment, which might be due to my use of the whole sample instead of investigating sex differences separately. Statistically, men perpetrate more sexual harassment than women (Brousseau, Blais & Hébert, 2024; Women and Equalities Committee, 2018), which, according to the evolutionary approach, is a form of a sex-specific mating strategy, and is therefore expected to be more pronounced in single rather than partnered men, i.e., those trying to secure mating opportunities (Buss, 2016). However, research is inconclusive as some evidence suggests that it is only certain and, specifically, less severe forms of sexual harassment, e.g., pinching, that single men are likely to perpetrate more than married men (Kenny & Samah, 2011), while simultaneously, the majority of female rape incidences are committed by intimate partners (ONS, 2023). Unfortunately, literature investigating singlehood's association with sexual harassment regardless of gender is unavailable, but my findings suggest that as a broad category single people experience comparable levels of

emotional abuse as well as perpetrate sexual harassment as much as those in committed relationships. The lack of significant difference might be also a reflection of the methodological approach as by merging all singles together and comparing them to a merged group of their peers in relationships, I was unable to capture the variety of experiences of, for example, singles who choose to be single specifically due to past negative experiences in relationships (Apostolou, 2017).

The lack of association between relationship status and sexual harassment is especially curious as singles in my study had significantly higher levels of sociosexuality, which past research linked with sexual harassment, potentially as a form of both signaling and testing sexual availability of prospective mates (Zheng et al., 2014; Bendixen & Kennair, 2017; Kennair & Bendixen, 2014). Sociosexuality is attenuated by levels of commitment, and therefore is lower in people in established relationships, which I observed in my results too (Rodrigues & Lopes, 2017). However, considering that the patterns of sociosexuality within my sample resembled those of the wider research, it is surprising that I found no significant difference between dark triad traits, which have been previously identified to characterise singles both in general (Benfante et al., 2024) and especially those with high levels of sociosexuality (Apostolou & Patsiarika, 2022). Although this lack of effect might be because the measure I used intends to capture the general personality structure using an overall score (differently from previous studies that focused on individual traits, e.g., psychopathy), the Dirty Dozen has excellent internal consistency ($\alpha = .83$; Knitter et al., 2025) and – as suggested by the authors – is successful in capturing the effects using a composite score. It is more likely, therefore, that because singles are not a homogeneous group investigating their individual differences at this level is inefficient. In fact, Burtăverde & Ene (2021) found that high sociosexuality and Dark Triad traits are observed in singles that are content with not

having a partner, attribute their singlehood to personal choice and prefer short-term mating opportunities over a committed relationship.

Finally, in line with previous research (Sagone et al., 2023), I found that both anxious attachments and avoidant attachments were more prevalent in my study's singles than participants in relationships. Single people also scored lower on mating performance. Both attachment avoidance and low mating performance is linked with longer spells of singlehood (Kirkpatrick & Hazan, 1994; Apostolou & Wang, 2019), which is understandable as building relationships requires not only willingness, but also skills to engage and connect with other individuals. Both factors are also likely to exacerbate one another in turn, e.g., not knowing how to interact might cause shyness and cause people to withdraw (Asendorpf, 1990). Similarly, clinginess – often seen in anxiously attached individuals – can be perceived as overbearing, causing difficulties in relationships too (Mikulincer & Shaver, 2007). But even though my results are in line with previous research, it is undeniable that singles with secure attachment styles exist (Pepping et al., 2024). In fact, given that the effect of attachment styles is observed in singlehood as a 'whole', it might be capturing not the prevalence, but intensity it is experienced by some individuals, which inadvertently affects the results of the full, undifferentiated sample and stresses the need to investigate what distinguishes them from their securely attached peers.

Singlehood Subgroups vs. Relationships

To address the above limitation of merging singlehood into a homogenous group, I investigated what are the different types of singles based on their reasons for singlehood. Motivations clustered into 3 categories. Singlehood due to interpersonal problems was motivated by fear of being hurt, negative past experiences and difficulties in attracting a partner. Singlehood for freedom was driven by the need to be free to follow one's wishes,

including being able to flirt around. Singlehood by choice was characterised by seeking to prioritise other life areas, belief in one's ability to attract a partner, yet being content with being single until the 'right one' comes around. In line with my prediction that singlehood is not a uniform experience, these emerged singlehood categories were characterised by statistically significant differences in mental health outcomes and individual characteristics when compared with each other and/or the committed relationships category. These effects remained significant even after controlling for age and sex, which were previously found to influence the experience of singlehood (Apostolou & Esposito, 2020; Oh, Chopik & Lucas, 2022).

Singlehood due to interpersonal problems had the highest levels of depression when compared with both those in relationships and single by choice. This type of singles also had significantly higher levels of anxiety and cognitive distortions than singles by choice but not those in committed relationships. Both singlehood by choice and singlehood due to interpersonal problems were characterised by significantly higher levels of attachment anxiety and attachment avoidance and significantly lower mating performance than being in a relationship. Singlehood by choice was also associated with experience of less emotional abuse than being single due to interpersonal problems or being in a relationship and significantly higher levels of sociosexuality than those in relationships but not those single due to interpersonal problems. There was no difference between the two singlehood groups and those in relationships on dark triad traits as well as experience and perpetration of sexual harassment.

This suggests that while some mating dynamics might be, in fact, more prevalent in singlehood regardless of its type, there is still a specific category of singles – single due to interpersonal problems; that fare worse than other types of singles and people in committed relationships. It makes sense why all singles would share some degree of similarity, e.g.,

lower mating performance, as compared with those in relationships they do not have a committed partner, which in itself confirms a sufficient level of mating efficiency. Most importantly, however, my results highlight that not only singlehood experiences are diverse, but also much more complex and nuanced than might seem. For example, I found that it was specifically singles who choose to remain single that exhibit levels of sociosexuality significantly higher than those in relationships, which – contrary to some previous research that linked absence of willingness for intimacy with low desire – suggests that postponing long-term commitment might be associated with increased interest in short-term and casual sexual opportunities (Pepping et al., 2024). However, it still remains unclear why those who are single due to interpersonal problems report much worse mental health outcomes, when – except for emotional abuse – their levels of potentially contributing factors, such as insecure attachments, are comparable to those single by choice.

The answer might lie in the significant difference of some individual cognitive distortions between the singlehood types. My results indicated that singles due to interpersonal problems are significantly more likely to assign labels, engage in ruminative “What if” questioning and hyperfocus on one, usually negative, detail than those single by choice. Cognitive distortions are directly associated with depression and anxiety and grow alongside the increase of internalizing problems seen in these mental disorders (Leung & Wong, 1998), thus, making individuals who experience such patterns of thinking the most at risk of mental health difficulties. If unaddressed, this link becomes even more exacerbated due to the self-perpetuating nature of cognitive distortions (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). For example, safety seeking and negatively skewed perceptions of self and other are linked with reduced engagement, social avoidance and loneliness, which in turn – contributes to biases such as heightened attention to negative detail in social settings (Leung & Poon, 2001; Cacioppo & Hawley, 2009; Cacioppo, Balogh, & Cacioppo, 2015;

Sprengh et al., 2020). Therefore, challenges that people who are single due to interpersonal problems face in the mating context might be related to broader difficulties in making and maintaining connections with others. Finally, this group's motivations for being single suggest a more negative perception of their relationship status than single by choice or for freedom. Thus, cognitive distortions experienced by them might be an unsuccessful form of managing the associated distress since certain types of distortions are linked with higher yet poorer execution of coping strategies (Spanos et al., 1979).

Interestingly, there was no significant difference in terms of individual cognitive distortions between neither of the singlehood categories and those in relationships. In fact, as reflected in descriptive statistics, the mean average of those in committed relationships was the second highest on 5 out of 9 items. While this might be a consequence of not having attempted to classify the relationship sample into categories, i.e., results skewed by partnered individuals who are significantly less happy, it could have also revealed a less understood role of these psychological mechanisms in the maintenance of pair bonding. While cognitive distortions are experienced by people regardless of the quality of their relationship, they are especially prevalent and severe in relationships marked by unhealthy dynamics (Hamamci & Büyüköztürk, 2004). Specifically, research shows that victims of intimate partner violence exhibit numerous cognitive distortions, for example, minimisation of harm, self-blame, which are in turn linked with reduced likelihood of leaving those relationships (Badenes-Sastre et al., 2025). This evidences our ability to create novel, distorted cognitions to manage cognitive dissonance experienced in distressing circumstances that are difficult to escape (Festinger, 1962). Moreover, from an evolutionary perspective, cognitive distortions are seen as an erroneous type of useful adaptations. Thus, their role in such contexts might be that of “preserving the relationship” and fulfilling what might be considered the most important drive – mating – even at the cost of subjective wellbeing.

Variance in Mental Health Outcomes and Mechanisms Behind It

Finally, my findings confirmed that the argued link between singlehood and poor mental health outcomes is driven by the most disadvantaged category. Specifically, the results indicated that being single due to interpersonal problems is a significant predictor of higher levels of both depression and anxiety, while being single by choice is not significant. In both models, the addition of cognitive distortions increased the explained variance and in the anxiety model – fully mediated the relationship with singlehood due to interpersonal problems. It is important to highlight that mediation observed in cross-sectional data does not imply causation, however, cognitive distortions were also a significant predictor on its own of both anxiety and depression, which evidenced that the previously established link between cognitive distortions and poor mental health in the general population applies to singlehood as well. This was reflected in the fact that those who experienced more total and individual-item cognitive distortions – single due to interpersonal problems – had higher levels of depression and anxiety symptoms too.

The results suggest that the anxiety in singles due to interpersonal problems can be explained by cognitive distortions, i.e., they experience more distorted patterns of thinking, which explain the elevated levels of anxiety. Distorted cognitions are known to draw attention to negative detail and to also skew one's perception of their competencies, i.e., to, simultaneously, exaggerate threats and make one feel less capable of facing them. In fact, one of the significantly elevated patterns of thinking I observed in this category of singles was increased asking *What if?*, which is a distortion closely related to anxiety (Agarwal & Sirts, 2025). Therefore, my findings provide some preliminary evidence that addressing these mechanisms might help alleviate the psychological difficulties associated with them. However, the depression in this category of singles was higher regardless of their levels of cognitive distortions, suggesting that although they experience more erroneous patterns of

thinking, there is something else unique to their experience that contributes to the elevated levels of depression.

Implications

My findings offer insights for both theory and practice. First of all, they evidence that some factors might be characteristic of singlehood at large. For example, it is unsurprising that self-reported mating performance is lower in singles when compared with those who evidently perform at least “well enough” – those who are in relationships. Similarly, absence of sexual and romantic commitment experienced by singles as a ‘whole’ accommodates unrestricted sexual attitudes to levels higher than are available to individuals in committed relationships. But besides these broadly defining factors (which are perhaps more descriptive of the relationship status rather than the actual experience), my results indicate that the experience of singlehood is heterogenous and should be studied as such.

I have discovered 3 distinct singlehood categories, which were characterised by unique patterns of experiences and psychological traits. I found that one type of singles is characterised by levels of mental health problems, such as depression and anxiety, beyond the clinical threshold. However, this category was very distinct from the mental profiles of the other two categories of singlehood, whose experiences were more comparable to those of people in relationships. In fact, it was only the most disadvantaged singlehood type that explained a significant proportion of variance in mental health outcomes of the sample. This evidences that studying singlehood as a broad category is not only insufficient in capturing nuance but will produce results skewed by the experience of some but not all.

Moreover, I have shown that the poor mental wellbeing of the most disadvantaged singles is at least partially explained by their elevated levels of cognitive distortions. Firstly, this calls for a closer investigation of mating-specific cognitions. Secondly, this finding

provides practical implications. Given that cognitive distortions are one of the most successfully challenged difficulties in applied psychology, my finding offers an avenue for alleviating the distress and potentially even increasing mating success of those who are currently struggling the most.

Limitations

My research is not without limitations. To begin with, the use of binary scale for singlehood reasons required me to separate people into distinct singlehood categories based on their chosen ‘top reason’. This approach does not account for the fact that people can simultaneously relate to different reasons and thus asking them to select only one might have caused some to make ambiguous choices. Thus, my categorisation of singles offers a limited perspective of how impactful different singlehood circumstances are. The use of binary data is also not recommended for statistical methods such as principal components analysis, which was reflected by inadequate KMO statistic (.45) and therefore the results should be approached with caution and treated as preliminary. Furthermore, my battery of reasons for singlehood was much shorter than those used in past research. While this was done to minimise survey fatigue associated with questionnaire-based research (Ghafourifard, 2024), it has potentially limited the number of singlehood clusters I was able to identify. It might have also led to participants selecting the *most* rather than *all* relevant items, which influenced the number of emerged singlehood categories in turn as well. For comparison, Apostolou, Jiaqing, & Esposito (2020) identified 4 broad singlehood domains when using a battery of 92 items.

Future Directions

Future studies would benefit from assessing the effects of singlehood reasons on a continuous scale for both statistical and theoretical reasons. Collecting data that offers more

variability will help to better assess the extent that singlehood reasons influence one's experience of singlehood, as well as ensure avoiding the reporting biases associated with self-selection of the top reason. Additionally, further research would benefit from using a bigger battery of singlehood reasons as it will provide a better overview of the singlehood categories that emerge. Finally, it might be beneficial to provisionally investigate whether mental health in singlehood is influenced by factors generally known to have protective or exacerbating effects on wellbeing as understanding of those will help to narrow down the risk factors as well as potential avenues for support.

Chapter 3: Wider Influences on the Mental Health of Singles

Drawing on the results of Study 1, I aim to replicate and build on the finding that mental health in singlehood is diverse, but these differences are best uncovered on a subgroup level. I also address the methodological limitations of the previous study by developing a comprehensive measure of singlehood reasons, which will allow for a more detailed understanding of the emerged singlehood types. Specifically, I intend to expand the list of items and instead of categorising single individuals based on their 'top reason' will assess the influence of different singlehood clusters depending on how relevant they are to an individual. The continuous approach recognises that people's individual circumstances are likely to be a result of several simultaneous influences and offers an opportunity to measure how much the experience of singlehood is shaped by *the degree* of relating to those different reasons. As in Study 1, alongside variables of mental health, I will investigate wider psychological differences, including total and individual cognitive distortions, which will help establish the convergent and divergent validity of the emerged singlehood clusters. Finally, considering that a within-group approach has been argued as preferable for research investigating variables only relevant to singles, e.g., reasons for singlehood, I will employ

this method to examine variance exclusive to individuals outside committed relationships (Park, Girme & MacDonald, 2024).

Additionally, Study 2 sets out to explore how mental health of singles is affected by the wider factors known to influence wellbeing. So far, research has assessed determinants of singlehood satisfaction, e.g., fulfilling sex life (Park, Impett & MacDonald, 2021), or positive appraisal of it, e.g., choice (Apostolou et al., 2019), yet little is known about the potential protective or exacerbating experiences regarding mental health specifically. Exploring how these effects vary across singlehood might help uncover risk factors relevant to subgroups generally considered robust to poor mental health as well as pathways to alleviating distress observed in other types of singles. Our psychological health depends on a variety of external and internal circumstances, including but not limited to, availability of supportive social connections, personality characteristics as well as attitudes and beliefs (Holt-Lunstad, 2024; Kang et al., 2023; Shojaee & French, 2014; Borgogna & Aita, 2024). And, just like the general population, different types of singlehood are likely to differ in terms of how accessible or relevant these conditions might be to them. Thus combined, this study will give us insight not only into the types of singles more likely to experience poor mental health, but also potential avenues for support.

Social Support

While partners might be the primary source of support and comfort, the influence and involvement of the wider social circles are just as important. Social networks play a major role in one's life as they provide instrumental and emotional support, shape self-perception and self-esteem and offer cognitive guidance (Mishna et al., 2016; Thoits, 2011; Rausa, 2008). Sense of social support is associated with better mental and physical health (Ozbay et al., 2007) as well as better coping with adversity and stress (Cohen & McKay, 2020). As I

explored before – from an evolutionary perspective – social connections, especially strong reciprocal relationships, have always been crucial to our survival, which is why the strive for social belonging and avoidance of social exclusion are one of our primary motivations (Oli, 2003; Baumeister & Leary, 1995). This might be why strong social ties are identified as a crucial element of happiness and thriving in singlehood too (Adamczyk, 2017; DePaulo & Morris, 2005).

But while there might be no self-evident downside to extra support and care from one's wider social circle regardless of life circumstances, it is unknown who it is most crucial to and how well it can outweigh mental difficulties experienced by certain groups of singles. For example, the involvement of friends and family might make the most difference to those who are less able to obtain emotional closeness and comfort within a romantic context. But, as seen in the factors associated with thriving in singlehood (Girme, Park & MacDonald, 2023) – strong social ties might be equally important and potentially even determine the wellbeing of those who choose to focus on other areas of life. At the same time, social support might not be equally attainable for everyone. For example, men report less self-perceived social support available to them outside of relationships than women, who also enjoy wider support networks in general (Umberson & Montez, 2010; Segrin, & Passalacqua, 2010). Therefore, it is important to investigate the effects of social support not only across singlehood types, but also between sex.

Locus of Control

Locus of control refers to an individual's perception of control over life events (Rotter, 1966). People characterised by strong internal locus of control tend to attribute their successes and failures to personal actions, whereas external locus of control is associated with the belief in luck and forces outside of one's influence. Internality is associated with better

physical and psychological health outcomes as well as academic and job performance, whereas external locus of control is linked with more illness, stress and passivity (Van Liew, 2020; Ng, Sorensen & Eby, 2006). When it comes to personality characteristics, externality is observed in those who are also high in neuroticism and have lower self-esteem, which for some is inevitably linked with challenges in social contexts (Simonetti, 2024; Žitný & Halama, 2011).

In fact, the above characteristics are associated with cognitive distortions, specifically, negative self-beliefs and negative appraisal of interpersonal domain (Maheshwari & Chadha, 2021), which suggests that one's perceived control over life events might have implications for mating beliefs and outcomes too (Fontanesi et al., 2024) Unsurprisingly, higher rates of external locus of control have been observed in singles who consider themselves unable to establish relationships – incels (Brzuszkiewicz, S. 2020). And although attitudes expressed by incels are extreme, they clearly illustrate the ultimate risks of having a skewed perspective of one's mating potential. Therefore, in line with the wider research on the effects of locus of control, it seems reasonable to speculate that mental health in singles will be associated with their general sense of ability to influence life experiences, including relationship formation. This might be then especially critical for those who attribute their singlehood to internal or external barriers as their wellbeing might be most dependent on whether they feel able to overcome those difficulties. In fact, if from an evolutionary perspective, mental distress in singlehood serves as a signal of adaptive threat, then having an internal locus of control might give people confidence that they can address it and this way lower the volume of that signal, i.e., psychological distress.

Sexism

Finally, the current world we live in is simultaneously marked by the highest ever gender equality and also novel severe forms of division (World Economic Forum, 2024; Pham et al. 2020). We are seeing an emergence of new, predominantly online communities built on shared hostility and prejudice towards the opposite sex (Ribeiro et al., 2021). Unfortunately, to avoid influences of the so-called manosphere is virtually impossible, which is worrying as even unintentional exposure to this content has been shown to promote misogyny and mistrust (Renstrom & Back, 2024). Sexist attitudes and behaviours might steer one towards a similar partner, however, as both hostile and benevolent sexism has been associated with reduced relationship satisfaction and length as well as higher frequency of conflicts, it seems like the negative consequences of prejudiced gender beliefs are experienced even by those who condone them and seek out partners who express them (Hall & Canterberry, 2011; Hammond & Overall, 2013; Barreto & Doyle, 2023).

Without doubt, sexism is also consequential to those outside relationships. Depending on their beliefs, singles are likely to attract or deter certain partners (Horwitz et al., 2023), which might then predispose them to experiences associated with poor mental health outcomes. For example, in Study 1, I have identified that singles are characterised by varying levels of sociosexuality, which is a trait associated with various forms and manifestations of sexism (Hall & Canterberry, 2011; Yost & Zurbriggen, 2006). This type of singles might be more likely to enjoy casual relationships, which both exacerbates their risk of experiencing sexual harassment and coercion, and – considering they're the most likely to interact with similar people – simultaneously reaffirm their pre-existing beliefs about the other sex (Bendixen & Kennair, 2024). On the other hand, singles who attribute their singlehood to personal shortcomings might experience poorer mental health, if – as is seen in the research of incels – due to their sexist beliefs, they misinterpret what is truly important in the interpersonal context, which consequently influences their mating success too. The effects of

radical gender views are unlikely to be exclusive to men, especially considering the emergence of the so-called Femosphere (the women's equivalent of Manosphere). Yet research explicitly examining the effects of sexism on the mental health of singles even broadly is unavailable.

Predictions

I predict that singlehood "as a whole" will not be associated with poorer mental health relative to those in relationships (Prediction 1). However, it will be associated with higher sociosexuality, higher anxious and avoidant attachment styles, and lower mating performance as compared to those in relationships (Prediction 2). Then, based on the findings of study 1, I expect 3 separate factors for singlehood to emerge: singlehood due to interpersonal problems, singlehood by choice and singlehood for freedom (Prediction 3). I expect these emerged clusters to be characterised by distinct psychological profiles, including different mental health outcomes and associated experiences, and cognitive distortion levels, specifically, *labelling*, *selective abstraction* and *What if?* individual cognitive distortions (Prediction 4). Furthermore, I predict that mental health outcomes in singles will be significantly explained by singlehood categories and cognitive distortions (Prediction 5). I would like to point out that – through the analyses – emerged singlehood clusters will be referred to as singlehood categories or types. This is not intended to imply that single individuals can be categorised into distinct divisions, but will serve as a tool for describing my findings.

Additionally, I predict that having more social support and a stronger internal locus of control will act as a protective factor and moderate the relationship between singlehood and mental health outcomes across all singlehood categories (Prediction 6). Additionally, depending on sex, social support will moderate the relationship between singlehood categories and mental health to different levels (Prediction 7). Finally, the relationship

between singlehood and mental health outcomes will be moderated by individual's levels of sexism across all singlehood categories (Prediction 8).

Methods

Participants

Prospective participants (18 years and above) were recruited online and through leaflets distributed on the university campus. The study was advertised through the researcher's personal social media as well as using a snowballing sampling method. Upon completion participants were invited to opt in to take part in a raffle of ten 25£ vouchers.

The mean age of the participants was 28.76 ($SD = 8.67$). Ages ranged from 18 to 68, however, 83.45% of participants were within 18-35 age, indicating that most of the participants were in their early adulthood. 73.45% of participants were Caucasian/White ($n = 213$), 7.93% were Black ($n = 23$), 4.48% were South Asian – Indian, Pakistani, etc. ($n = 13$). 104 participants indicated that their gender is male, 166 female, and 20 selected 'Other'. 103 participants were biologically male, 186 female, and 1 selected 'other'. 61.38% of participants were heterosexual and 20.35% were bisexual. 38.97% ($n = 113$) of the participants have completed an undergraduate degree ($n = 113$) and 24.83% ($n = 72$) postgraduate degree. The largest group of participants came from a middle socioeconomic background 43.79% ($n = 127$). The full table of participants' ethnicities, sexual orientation, education and socioeconomic background can be found in the Appendix A, Table A2.

Materials

The demographics form collected the following information: age, biological sex, gender, sexual orientation, current relationship status, ethnic/racial background, highest level of education completed, social/economic status.

Reasons for Singlehood

Participants who indicated being single were presented with a battery of 44 items, which investigated motivations for being single. The measure was expanded in order to gauge a more nuanced understanding of clusters that emerged in Study 1 as well as to allow for other potential factors to reveal themselves. It was split into 3 categories based on clusters that emerged in study 1. The original items served as foundation for generating additional ones, which also drew on items observed to cluster together by Apostolou (2017) and were discussed and refined with the primary supervisor of this research. Singlehood due to interpersonal problems (items A1-A14) was expected to be characterised by negative experiences and attitudes towards mating (e.g., “*No one flirts with me/expresses interest in me*”) and/or fear of rejection (e.g., “*I am afraid the relationship will fail*”). Single by choice (items B1 – B14) were expected to make an active choice to bide their time in order to prioritise other areas of life over dating (e.g., “*I am currently focusing on work, education, etc.*”). Finally, those who were single for freedom (items C1 – C15) were expected to express no interest in settling for a committed relationship and seeking freedom to express themselves (e.g., “*I want to be free to do whatever I want.*”) and potentially enjoying casual sexual opportunities (e.g., “*I enjoy the attention of many people.*”). The statements were rated on a 5-point Likert scale ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”). The full list of the items used can be found in the table below (see Table 10).

Table 10

List of reasons for singlehood as divided into expected to emerge categories

Singlehood	Item
Type	
	<i>I experience difficulties in attracting a partner (A1)</i>
	<i>No one flirts with me/expresses interest in me (A2)</i>
	<i>I do not find it emotionally difficult to be in a relationship (Reverse-coded; A3)</i>
	<i>My poor mental health is preventing me from dating (A4)</i>
	<i>I do not find it difficult to be emotionally close to/vulnerable with other people (Reverse-coded; A5)</i>
Single due to	<i>I have been rejected too many times (A6)</i>
Interpersonal	<i>I am afraid the relationship will fail (A7)</i>
Problems	<i>I am scared of being hurt (A8)</i>
	<i>I do not trust the gender I am attracted to (A9)</i>
	<i>I am afraid that my partner will stop loving me (A10)</i>
	<i>I do not think I am worthy of love/that someone could love me (A11)</i>
	<i>I find it easy to rely on other people (Reverse-coded; A12)</i>
	<i>There is something wrong with me that makes it impossible to get in a relationship (A13)</i>
	<i>I am single because I fear that my negative aspects will be revealed (A14)</i>
	<i>I have had bad experiences in my previous relationship(s) (A15)</i>
	<i>Although I can attract people, I am not able to find the right one (B1)</i>
Single by	<i>Right now, I have to prioritise other things in life (B2)</i>
Choice	<i>I choose to remain single for the time being (B3)</i>
	<i>I want to be free to chase my own goals (B4)</i>

Singlehood	Item
Type	
	<i>I have high standards/expectations and will not settle for less (B5)</i>
	<i>I want to work on myself first before I start dating (B6)</i>
	<i>It is the right time for me to be in a relationship (Reverse-coded; B7)</i>
	<i>I am waiting for the right one (B8)</i>
	<i>I am currently focusing on my career, education, etc. (B9)</i>
	<i>I think in the future I will be able to attract “better” partners (B10)</i>
	<i>I am working on increasing my dating prospects (B11)</i>
	<i>There are people I could date, but I do not want to rush (B12)</i>
	<i>I feel ready to date right now (Reverse-coded; B13)</i>
	<i>I do not have enough time to devote to a relationship (B14)</i>
	<i>I want to be free to do whatever I want (C1)</i>
	<i>I enjoy the attention of many people (C2)</i>
	<i>I want to settle (Reverse-coded; C3)</i>
	<i>I do not want anyone to restrict my behaviours (C4)</i>
	<i>Being in a relationship limits my need for personal freedom (C5)</i>
Single for	<i>I like to be independent (C6)</i>
Freedom	<i>I do not want to think about someone else (C7)</i>
	<i>I want to be able to flirt around (C8)</i>
	<i>I want to prioritize needs of others over my own (Reverse-coded; C9)</i>
	<i>I do not want to answer to anyone (C10)</i>
	<i>I want to be myself (C11)</i>

Singlehood	Item
Type	
	<i>I do not want to feel obliged to sacrifice my time for others (C12)</i>
	<i>I want to invest my energy into other people (Reverse-coded; C13)</i>
	<i>I do not have the effort that committed relationships require (C14)</i>
	<i>I want to be able to do what I want when I want to do it (C15)</i>

PHQ-9 (Kroenke, Spitzer, Williams, 2001), GAD-7 (Spitzer et al., 2007), CD-quest-S9 (Morrison et al., 2022), EAQ (Jacobson & Gottman, 1998), MPS (Apostolou, Shialos & Georgiadou, 2019), SHCI (Kennair & Bendixen 2012) and SOI-R (Penke & Asendorpf, 2008) were used as described in Materials of Study 1.

Sexism

To assess participants' attitudes towards the opposite sex, short forms of Ambivalent Sexism Inventory (ASI; Glick & Fiske, 1996) and Ambivalence Toward Men Inventory (AMI; Glick & Fiske, 1999) by Bendixen & Kennair (2017) were administered (Appendix I). ASI consists of 2 dimensions: Hostile Sexism (e.g., "Most women interpret innocent remarks or acts as being sexist") and Benevolent Sexism (e.g., "Every man ought to have a woman whom he adores"). Similarly, AMI consists of 2 corresponding dimensions: Hostility towards men (e.g., "When men act to "help" women, they are often trying to prove they are better than women" and Benevolence towards Men (e.g., "Every woman needs a male partner who will cherish her"). Both short forms are rated on a 5-point Likert scale from 1 ("Strongly disagree") to 5 ("Strongly agree") and consist of 8 items each. Both can be used as an overall measure of sexist attitudes, which is obtained by averaging the scores across all the items. The short form versions of the original ASI and AMI have been assessed to effectively

capture the 2 dimensions with Cronbach alphas from $\alpha = .73$ to $\alpha = .86$ on individual dimensions in the authors' original evaluation study but have also been successfully used as a total measure of sexism with $\alpha = .86$ for ASI (Bendixen & Kennair, 2024). My internal reliability analysis of ASI and AMI, when used as an overall score of 8 items, produced $\alpha = .89$ and $\alpha = .75$ respectively.

Locus of Control

To assess participants' perceived control over life events, Rotter's Locus of Control Scale (1966; Appendix J) has been used. The scale consists of 29 items (including 6 fillers), which are made of two statements out of which participants select the one that reflects their beliefs best, e.g., "Many of the unhappy things in people's lives are partly due to bad luck." vs. "People's misfortunes result from the mistakes they make." Items reflective of external locus of control are given a score of 1, whereas internal locus is scored a 0. Higher scores are indicative of stronger external locus of control, which is associated with the belief that life outcomes are largely due to luck, chance or circumstances beyond control. Lower scores are reflective of internal locus of control, which typically characterises people who attribute outcomes to their own abilities and efforts. The scale is widely used in academic and health research and has been evidenced in multiple meta-analyses as an efficient tool predictive of physical and mental health outcomes (Cheng, Cheung & Lo, 2016; Presson & Benassi, 1996), work performance (Ng, Sorensen & Eby, 2006), and identity status (Lillevoll, Kroger & Martinussen, 2013). My own internal reliability analysis produced Cronbach alpha, $\alpha = .7$.

Social Support

To assess participants' perceived social support levels, the Social Provisions Scale (SPS; Cutrona & Russell, 1987, Appendix K) was administered. The scale consists of 24 items (e.g., "There are people I can depend on to help me if I really need it."), which are rated

on a 4-point Likert scale from 1 (“Strongly Disagree”) to 4 (“Strongly Agree”). The measure has 6 dimensions of social provisions (e.g., attachment, social integration, etc.); however, it can also be used as a total score. Psychometric properties of SPS have been validated in adult and youth samples, with the measure demonstrating excellent internal and test-retest reliability, as well as predictive validity of measures of loneliness and health outcomes (Duru & Balkis, 2007; Osmane, Brennan & Dolan, 2021). My own internal reliability analysis indicated Cronbach alpha, $\alpha = .93$.

Design

The study was of a cross-sectional observational design. The independent variables were relationship categories, i.e., committed vs. single and different types of singlehood as expected to emerge in the PCA analysis, i.e., single due to interpersonal problems, single by choice, single for freedom. The dependent variables were scores on measures of depression (PHQ-9), anxiety (GAD-7), cognitive distortions (CD-quest-S9), sociosexuality (SOIR), attachment anxiety and attachment avoidance (ECRS-S), experience and perpetration of sexual harassment (SHCI), emotional abuse (EAQ), mating performance (MPS), social support (SPS), sexism (ASI and AMI).

Procedure

The study was conducted online using a research website Qualtrics. Participants accessed the study by entering the link advertised on the researcher’s personal social media or by following the QR code on the advertisement leaflets distributed on the university campus. They were provided with an information sheet, which debriefed them about the study’s aim and if they consented to take part, they were presented with the demographics form, which was followed by all the questionnaires mentioned above in a random order to prevent response bias. Participants who indicated being single were presented with a list of reasons

for singlehood and asked to rate how much each of them applied to their circumstances. Due to the sensitive nature of the sexual harassment measure, participants were made aware that they are free to not answer the questions of the measure if they do not wish to. When responding to the emotional abuse questionnaire, participants who have never been in a committed relationship, or not had an ex-partner were instructed to select 'N/A'. After finishing the questionnaires, they were presented with the debrief form which explained the rationale behind the study, provided researchers' contact details and information about the support available. The final screen before exiting displayed a link to the voucher raffle portal and a randomly generated number that participants were asked to input if they chose to participate. Median response time was 21 minutes (IQR = 17 minutes). The research has been approved by the Swansea University's School of Psychology's Research Ethics Committee (Approval Number: 12024104679260). Information sheet, consent form, debrief and the ethical approval for Study 2 can be found in Appendices O-S in the respective order.

Data Analysis Plan

The analyses investigating the differences in mental health outcomes and interpersonal experiences of participants in relationships and those single as well as PCA analysis of singlehood categories will be the same as in Study 1.

To assess to what extent the emerged singlehood categories are associated with distinct psychological outcomes and factors expected to exacerbate or attenuate mental health experiences, series of Pearson's correlations will be performed. The variables will be singlehood types and measures mentioned in the Materials section. The assumption of linearity of data and absence of outliers will be checked by using scatterplots prior to conducting the test. Spearman's rho will be used if the assumption of normality of the data is violated.

Hierarchical multiple regression will be performed to evaluate whether the variance in mental health outcomes (the DVs as assessed using measures of depression and anxiety) is significantly explained by singlehood categories (the IVs) and mediated by cognitive distortions. In Step 1, singlehood categories and social support, locus of control and measures of sexism will be included in the model, followed by these variables and interaction terms between them included in Step 2. Before performing the analyses, multicollinearity will be assessed in addition to already checked assumptions of normality and homogeneity. This will be done by calculating the Variance Inflation Factor (VIF). Differently from Study 1, in order to meaningfully capture the diversity in experiences of singlehood, only responses from single participants will be used in regression analyses. Finally, singlehood categories will be means-centered so that the intercept in the models represent the mean of single participants overall.

Results

337 participants have completed the study. Data of 47 participants had to be removed due to their completion time being shorter than 5 minutes or longer than 1 hour, suggesting insufficient attention was paid to the study, and/or had irrelevant comments submitted in textbox questions (e.g., Lorem Ipsum, which is a ‘filler text’ tool commonly used by bots to fill the text box questions in surveys). Therefore, data of 290 respondents was used for the analysis.

Data from participants who indicated being in an uncommitted relationship ($n = 17$) and who selected “Other” ($n = 7$) as their relationship status, has not been used as they were not categories of interest in the current study. Therefore, in the subsequent analyses data of 3 categories – married ($n = 39$), in a committed relationship ($n = 74$), and single ($n = 153$) was used. 39 participants and 74 participants who indicated being married or in a committed

relationship with one person (respectively) were grouped together as Committed category ($n = 113$). Scores of dependent measures (see Materials section) were calculated in accordance with the guidelines provided by the authors of the questionnaires.

The assumptions of the tests and suitability of the data were assessed in the way outlined in the Data analysis plan. The results of these tests can be found in Appendix T, Tables T1 – T18, Figures T1 – T3.

Prediction 1: Singlehood ‘As a Whole’ Is Not Associated With Poorer Mental Health Relative to Those in Relationships

Descriptive statistics of participants in committed relationships and those who were single, and their scores on measures of depression, anxiety and cognitive distortions can be found in the table below (Table 11). Differently from study 1, it was participants in committed relationships who scored higher than single participants on measures of depression, anxiety and cognitive distortions. Their scores on the measure of depression (PHQ-9) were slightly higher than 10 points, which in clinical practice serves as the screening threshold for minor depression and warrants further evaluation and intervention. Neither of the 3 groups reached the clinical cut-off of 10 points on the measure of anxiety (GAD-7), which is used for identifying the generalised anxiety disorder. Comparable variability in singles as well as committed participants’ scores (as seen in the standard deviation scores) suggests that both groups were characterised by a similar range of experiences.

But despite those in relationships scoring higher on all 3 measures, the Independent Samples t-test found no significant difference between relationship status and depression, $t(264) = .86, p = .392, d = .11, CI [-.14, .35]$; GAD-7, $t(264) = 1.79, p = .074, d = .13, CI [-.02, .47]$; and CD-quest-S9, $t(264) = 1.09, p = .278, d = .14, CI [-.11, .38]$. This suggests that

participants' mental health outcomes are similar regardless of whether they were in a relationship or single.

Prediction 2: Singlehood 'As a Whole' Is Associated With Higher Sociosexuality, Higher Anxious and Avoidant Attachment Styles, and Lower Mating Performance as Compared to Those in Relationships

Descriptive statistics of participants in committed relationships and those who were single, and their scores on measures of sociosexuality, attachment anxiety, attachment avoidance and mating performance can be found in the table below (Table 11). Mean scores of single participants were higher than scores of participants in committed relationships on measures of sociosexuality, attachment avoidance, but lower on mating performance, which replicated findings of Study 1 and broader literature. However, singles also scored lower than those in relationships on attachment anxiety, which was different to what I found in Study 1.

Independent Samples t-test found no significant relationship between relationship status and sociosexuality, $t(264) = .1.29, p = .774, d = -.04, CI [-.28, .21]$ and attachment anxiety, $t(264) = .43, p = .67, d = .05, CI [-.19, .3]$. A significant relationship was observed between relationship status and attachment avoidance, $t(264) = -8.38, p < .001, d = -1.04, CI [-1.3, -.78]$, with participants who were currently single ($M = 21.66; SD = 6.68$) scoring higher than those in committed relationships ($M = 14.78, SD = 6.53$). There was also a significant difference between relationship categories and mating performance scores, $t(264) = 8.73, p < .001, d = 1.08, CI [.82, 1.34]$, with those in committed relationships scoring higher ($M = 16.26, SD = 4.09$) than those currently single ($M = 11.78, SD = 4.16$). These findings suggest that those currently single and those in relationships are characterised by comparable levels of attachment anxiety and sociosexuality. However, single individuals have

significantly higher scores of attachment avoidance and significantly lower scores of mating

Measure	Committed			Single		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Depression	113	10.34	6.94	153	9.61	6.78
Anxiety	113	9.25	5.78	153	7.97	5.69
Cognitive Distortions	113	27.31	15.05	153	25.38	13.73
Sociosexuality	113	3.43	1.54	153	3.49	1.75
Attachment Anxiety	113	24.27	7.67	153	23.86	7.91
Attachment Avoidance	113	14.78	6.53	153	21.66	6.68
Mating Performance	113	16.26	4.09	153	11.78	4.16

performance.

Table 11

Descriptive statistics of participants' in committed relationships and single scores on measures of depression, anxiety, cognitive distortions, sociosexuality, attachment anxiety, attachment avoidance and mating performance

Prediction 3: 3 Separate Factors for Singlehood Will Emerge: Single Due to Interpersonal Difficulties, Single by Choice, Single for Freedom

To investigate whether reasons for singlehood cluster into categories, PCA analysis was performed. Sample size to item ratio was considered adequate based on rules of thumb of minimum 5-20 items per variable and a total sample of at least 100-200 participants suggested in past research (Hair et al., 2018; MacCallum et al., 1999). The number of principal components extracted has been determined by referring to the Scree plot and if the

Eigenvalue was greater than 1. Oblimin rotation was applied on a correlation matrix. The Kaiser-Meyer-Olkin (KMO) was .81 indicating excellent sampling adequacy. Bartlett's test of sphericity was significant $\chi^2(561) = 2947.17, p < .001$, suggesting that the correlations between variables were strong enough to justify the use of the PCA. 4 categories emerged and can be seen in the table below (Table 12). First, "Single for Freedom" explained 15.2% of variance. Second, "Single due to Insecurities" explained 13.5% of variance. Third, "Single by Choice" explained 8.9% of variance. Fourth, "Single due to Interdependency Difficulties" explained 7.6% of variance. 2 of the expected singlehood categories, i.e., Single by Choice and Single for Freedom, have emerged, whilst the expected Single due to Interpersonal Problems split into two dimensions – Single due to Insecurities and Single due to Interdependency Difficulties. It is important to note that due to the nature of PCA, the current results need to be treated as exploratory and require replication and/ or confirmatory factor analysis (CFA) in an independent sample.

Table 12*Results of the PCA analysis of singlehood reasons*

Item	Question number	Single for Freedom	Single due to Insecurities	Single by Choice	Single due to Interdependency Difficulties
<i>I don't want anyone to restrict my behaviours</i>	C4	.845			
<i>I want to be able to do what I want when I want to do it</i>	C15	.820			
<i>I want to be free to do whatever I want</i>	C1	.801			
<i>I like to be independent</i>	C6	.770			
<i>Being in a relationship limits my need for personal freedom</i>	C5	.763			
<i>I don't want to answer to anyone</i>	C10	.759			
<i>I don't want to feel obliged to sacrifice my time for others</i>	C12	.733			
<i>I don't want to think about someone else</i>	C7	.709			
<i>I want to be free to chase my own goals</i>	B4	.584			
<i>I want to be myself</i>	C11	.566			
<i>I don't have the effort that committed relationships require</i>	C14	.554			

Item	Question number	Single for Freedom	Single due to Insecurities	Single by Choice	Single due to Interdependency Difficulties
<i>I don't think I am worthy of love/that someone could love me</i>	A11		.816		
<i>I am single because I fear that my negative aspects will be revealed</i>	A1		.771		
<i>I am afraid the relationship will fail</i>	A7		.754		
<i>My poor mental health is preventing me from dating</i>	A4		.750		
<i>I am afraid that my partner will stop loving me</i>	A10		.729		
<i>There is something wrong with me that makes it impossible to get in a relationship</i>	A13		.712		
<i>I am scared of being hurt</i>	A8		.651		
<i>I have been rejected too many times</i>	A6		.575		
<i>I want to work on myself first before I start dating</i>	B6		.499		
<i>I don't want to prioritize needs of others over my own</i>	C9		-.456		
<i>I experience difficulties in attracting a partner</i>	A1		.450		

Item	Question number	Single for Freedom	Single due to Insecurities	Single by Choice	Single due to Interdependency Difficulties
<i>Right now, I have to prioritise other things in life</i>	B2			.703	
<i>It's not the right time for me to be in a relationship</i>	B7			.702	
<i>I choose to remain single for the time being</i>	B3			.567	
<i>I don't feel ready to date right now</i>	B13			.559	
<i>I'm currently focusing on my career, education, etc.</i>	B9			.513	
<i>I do not have enough time to devote to a relationship</i>	B14			.456	
<i>I find it difficult to be emotionally close to/vulnerable with other people</i>	A5				.737
<i>I find it emotionally difficult to be in a relationship</i>	A3				.729
<i>I find it difficult to rely on other people</i>	A12				.693
<i>I want to settle</i>	C2				-.564
<i>I want to be able to flirt around</i>	C8				-.534
<i>I think in the future I will be able to attract "better" partners</i>	B10				-.415

Item	Question number	Single for Freedom	Single due to Insecurities	Single by Choice	Single due to Interdependency Difficulties
Eigenvalue		8.085	6.795	4.052	2.552
Proportion Variance (%)		15.2	13.5	8.9	7.6
Cumulative (%)		15.2	28.7	37.5	45.2%

Prediction 4: Singlehood Categories Will Be Associated With Different Psychological Outcomes, Factors Associated With Mental Health Experiences and Cognitive Distortions, Specifically, Labelling, Selective Abstraction and “What If?”

Series of correlations were performed to investigate whether being single for a specific set of reasons is associated with specific psychological outcomes. Measures of how strongly participants related to different clusters of singlehood were established by calculating mean average of their scores on items corresponding to those clusters with reverse scoring taken into account.

As shown in the table below, being single due to insecurities was significantly associated with the most psychological outcomes (see Tables 13-15). This category exhibited strong positive correlation with depression, anxiety, total level of cognitive distortions and attachment anxiety. Moderate positive correlations were observed for selective abstraction, “what if?” cognitive distortion as well as indicated higher levels of emotional abuse. There were also small yet significant positive correlations between this category of singlehood reasons and attachment avoidance, labelling and sociosexuality. Singlehood due to interdependency difficulties exhibited the same correlational trends, however, most of the associations were half as strong and within weak correlation range ($r < .3$). There was also no significant relationship between singlehood due to interdependency difficulties and labelling. There were small positive correlations between singlehood by choice and depression, cognitive distortions, and selective abstraction as well as a small negative correlation with sociosexuality. Finally, singlehood for freedom was significantly associated with only two measures: attachment anxiety (small negative correlation) and attachment avoidance (moderate positive correlation). It is worth noting that due to not having

conducted multiple comparison corrections, our findings are at a higher risk of type 1 error and therefore below interpretations should be approached with caution and require further replication.

Our results suggest that the more people attribute their singlehood to their insecurities the more likely they are to experience negative mental health outcomes, such as depression and anxiety, elevated levels of cognitive distortions overall and, specifically, more likely to engage in labelling, selective abstraction and ask “What if?”. They are also more likely to have experienced emotional abuse, to exhibit higher sociosexuality and unhealthy relational styles. The same yet less severe outcomes are relevant to those who put high emphasis on interdependency difficulties as the deciding reason preventing them from establishing a relationship. Belief that one is single by choice (rather than any other external or internal factors) did not correlate significantly with majority of measures I used in this study, however, the more one “chose” to be single the more depressive symptoms and cognitive distortions, especially – selective abstraction – they experienced. High attribution of singlehood to choice was associated with higher attachment avoidance, and a significant reduction in sociosexuality, which was observed only in this singlehood category. Finally, my results suggested that the more people believed they were not in a relationship because they sought freedom the more attachment avoidance and the less attachment anxiety they experienced, however, their psychological outcomes were not affected otherwise.

Only singlehood due to insecurities exhibited significantly lower levels of social support, which highlights that singles who are low in self-confidence and hold a negative view of oneself are also likely to have reduced opportunity for meaningful social connection. Surprisingly, no singlehood types were statistically more likely to be characterised by neither higher nor lower

locus of control. Yet in both men and women, significantly higher levels of sexism were positively associated with singlehood due to insecurities and due to interdependency difficulties, which suggests that people who attribute their singlehood to inter- and intrapersonal challenges tend to experience more prejudiced beliefs about the opposite sex than those who see their singlehood as a result of having other priorities in life.

Table 13

Results of the correlations between singlehood types and depression, anxiety, attachment anxiety and attachment avoidance, emotional abuse, sociosexuality

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Single due to insecurities	153	3.06	.77	-								
2. Single by choice	153	3.41	.66	.18*	-							
3. Single for freedom	153	3.5	.89	.03	.55**	-						
4. Single due to interdependency difficulties	153	2.87	.52	.36**	.13	.16	-					
5. Depression	153	9.61	6.78	.6**	.21*	-.05	.23*					
6. Anxiety	153	7.97	5.69	.58**	.12	-.04	.27**	.79**				
7. Attachment Anxiety	153	23.86	7.91	.57**	-.16	-.27**	.19*	.41**	.42**			

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
8. Attachment Avoidance	153	21.66	6.68	.26*	.22*	.37**	.25*	.15*	.16*	.03		
9. Emotional Abuse	153	2.91	2	.46**	-.12	-.03	.23*	.45**	.49**	.38**	.22**	
10. Sociosexuality	153	2.94	2.78	.17*	-.17*	.08	.28**	.16*	.13*	.05*	.05	.23**

Table 14

Results of the correlations between singlehood types and labelling, selective abstraction, “What if?” and total levels of Cognitive Distortions

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Single due to insecurities	153	3.06	.77	-							
2. Single by choice	153	3.41	.66	.18*	-						
3. Single for freedom	153	3.5	.89	.03	.55**	-					
4. Single due to interdependency difficulties	153	2.87	.52	.36**	.13	.16	-				
5. <i>Labeling</i>	153	2.91	.2	.29**	.18*	.08	.15	-			
6. <i>Selective abstraction</i>	153	2.94	2.78	.41**	.28**	.12	.18*	.37**	-		

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
7. <i>What if?</i>	153	2.37	2.39	.32**	.15	.03	.21*	.27**	.32**	-	
8. Cognitive distortions (Total measure)	153	25.38	13.73	.6**	.27**	.12	.29**	.57**	.71**	.59**	-

Table 15

Results of the correlations between singlehood types and social support, locus of control, sexist attitudes to towards men (in women) and sexist attitudes towards women (in men)

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Single due to insecurities	153	3.06	.77	-							
2. Single by choice	153	3.41	.66	.18*	-						
3. Single for freedom	153	3.5	.89	.03	.55**	-					
4. Single due to interdependency difficulties	153	2.87	.52	.36**	.13	.16	-				
5. Social Support	153	71.52	13.31	-.37**	-.07	-.01	-.16	-			
6. Locus of Control	153	13.91	3.99	.12	.08	-.01	-.06	-.12*	-		

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
7. Sexism towards women (in men)	62	21.79	7.65	.27*	<.001	-.06	.32*	-	-	-	
8. Sexism towards men (in women)	80	20.69	6.51	.36*	-.09	.11	.26*	-	-	-	-

Prediction 5: Mental Health Outcomes Will Be Significantly Explained by Singlehood Categories and Cognitive Distortions

Depression

Step 1. To assess the relationship between singlehood categories and depression severity a multiple regression was performed. The overall model was significant and indicated that singlehood categories explained 37% ($R^2 = .37$) of the variance in depression, $F(4, 148) = 23.37, p < .001$. Being single due to insecurities and single by choice were significant predictors of higher, whereas being single for freedom was a significant predictor of lower depression levels. Being single due to interdependency difficulties was not a significant predictor of depression levels. The results suggest that variance in depression severity can be significantly explained by singlehood categories: being single due to insecurities and single by choice is associated with an increase in depression severity, whilst singlehood for freedom with a significant decrease. The results of individual predictors can be seen in the table below (Table 16).

Step 2. To assess the impact of cognitive distortions on the relationship between singlehood categories and depression severity, a hierarchical multiple regression was conducted. The overall model was significant and suggested that singlehood categories and cognitive distortions levels explained 46% ($R^2 = .46$) of the variance in PHQ scores, $F(5, 147) = 27.07, p < .001$. The addition of cognitive distortions resulted in a significant increase in explained variance, $\Delta R^2 = .09, F(1, 147) = 26.05, p < .001$. Cognitive distortions were significantly associated with higher levels of depression. After their inclusion in the model, the effect of being single due to insecurities reduced from $\beta = .56 (p < .001)$ in Step 1 to $\beta = .36 (p < .001)$ Step 2, indicating a reduction of 39.2% and a partial mediation of the relationship. Similarly, the effect of being single for freedom decreased from $\beta = -.18 (p < .05)$ in step 1 to $\beta = -.17 (p < .05)$, which was a reduction of 5.5%. Further statistical analysis

suggested a full mediation for being single by choice, which decreased from $\beta = .2$ ($p < .05$) in Step 1 to no longer significant in Step 2. Being single due to interdependency difficulties remained non-significant across both models. The results suggest that variance in depression severity can be significantly explained by singlehood categories and cognitive distortions: being single due to insecurities and higher frequency of cognitive distortions are significant predictors of higher depression severity, whereas being single for freedom with lower severity. This suggests that singles due to insecurities experience more, while singles for freedom less depression symptoms than the average of the whole sample regardless of their cognitive distortion levels. However, whilst singlehood by choice is associated with higher depression levels, this relationship might be driven by cognitive distortions experienced by this category, as the association is no longer significant after cognitive distortions are included in the model. The results of individual predictors can be seen in the table below (Table 16).

Table 16

Hierarchical Regression Results for Depression

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 1						.39	.37**
Intercept	9.61	8.75	10.47	.44			
Single for Freedom	-1.34*	-2.51	-0.16	.59	-.18		
Single due to Insecurities	4.93**	3.71	6.16	.62	.56		
Single by choice	2.07*	.48	3.66	.8	.2		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single due to interdependency difficulties	.29	-1.5	2.08	.9	.02		
Step 2						.48	.46**
Intercept	9.78	8.99	10.58	.4			
Single for Freedom	-1.34*	-2.42	-.25	.55	-.17		
Single due to Insecurities	3.04**	1.69	4.39	.68	.34		
Single by choice	1.41	-.09	2.9	.76	.14		
Single due to interdependency difficulties	-.1	-1.76	1.56	.84	-.01		
Cognitive Distortions	.19**	.12	.27	.04	.39		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Anxiety

Step 1. To assess the relationship between singlehood categories and anxiety severity a multiple regression was conducted. The overall model was significant and indicated that singlehood categories explained 33% ($R^2 = .33$) of the variance in GAD-7 scores, $F(4, 148) = 19.79, p < .001$. Being single due to insecurities was the only significant predictor of anxiety associated with an increase of symptoms. Being single for freedom, by choice and due to

interdependency difficulties were not significant predictors of anxiety levels. The results suggest that variance in anxiety severity can be significantly explained by singlehood categories: being single due to insecurities is associated with significantly higher anxiety levels. The results of individual predictors can be seen in the table below (Table 17).

Step 2. To assess the impact of cognitive distortions on the relationship between singlehood categories and anxiety severity, a hierarchical multiple regression was conducted. The overall model was significant and suggested that singlehood categories and cognitive distortions levels explained 46% ($R^2 = .46$) of the variance in GAD-7 scores, $F(5, 147) = 27.08, p < .001$. The addition of cognitive distortions resulted in a significant increase in explained variance, $\Delta R^2 = .13, F(1, 147) = 36.97, p < .001$. The significant effect of being single due to insecurities decreased from $\beta = .54 (p < .001)$ in Step 1 to $\beta = .29 (p < .001)$ in Step 2, indicating a reduction of 46.3% and a partial mediation of the relationship. Cognitive distortions were a significant predictor of higher anxiety levels. Being single for freedom, single by choice and single due to interdependency difficulties were not significant predictors of anxiety levels. The results suggest that anxiety severity can be significantly explained by singlehood categories and cognitive distortions as individual predictors: being single due to insecurities and higher frequency of cognitive distortions is associated with higher anxiety. Differently from Study 1, singlehood due to insecurities (“Singlehood due to interdependency problems” in Study 1) remained significant in Step 2, which suggests the relationship between this singlehood category and anxiety is not fully explained by cognitive distortions. However, in the current study, cognitive distortions accounted for almost half of singlehood due to insecurities effect on anxiety, indicating that they play a key role in this association. The results of individual predictors can be seen in the table below (Table 15).

Table 17*Hierarchical Regression Results for Anxiety*

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 1						.35	.33**
Intercept	7.97	7.23	8.72	.38			
Single for Freedom	-.67	-1.68	.35	.51	-.1		
Single due to Insecurities	4.05**	2.99	5.11	.54	.54		
Single by choice	.6	-.78	1.97	.7	.07		
Single due to interdependency difficulties	.82	-.73	2.37	.78	.07		
Step 2						.48	.46**
Intercept	8.15	7.48	8.82	.34			
Single for Freedom	-.67	-1.58	.24	.46	-.1		
Single due to Insecurities	2.16**	1.02	3.29	.57	.29		
Single by choice	-.07	-1.32	1.18	.63	-.01		
Single due to interdependency difficulties	.43	-.96	1.83	.71	.04		
Cognitive Distortions	.19**	.13	.26	.03	.47		

Note. *CI* = confidence interval; LL = lower limit; UL = upper limit; **p* < .05. ***p* < .001;

Prediction 6: Having More Social Support and a Stronger External Locus of Control Will Act as a Protective Factor and Moderate the Relationship Between Singlehood and Mental Health Outcomes Across All Singlehood Categories

Depression × Social Support

Step 1. To assess the relationship between singlehood categories, social support and depression severity a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 38% ($R^2 = .38$) of the variance in depression levels, $F(5, 147) = 19.6, p < .001$. As individual predictors, being single due to insecurities and being single by choice predicted significantly higher, while being single for freedom – lower levels of depression. Being single due to interdependency difficulties and social support were not significant predictors in this model. The results of the individual predictors can be seen in the table below (Table 18).

Step 2. A hierarchical regression with interaction terms was conducted to assess whether the relationship between singlehood categories and depression severity depended on levels of social support. The overall model was significant and indicated that singlehood categories and social support explained 39% ($R^2 = .39$) of the variance in depression levels, $F(9, 143) = 11.68, p < .001$, however, the inclusion of interaction terms did not result in a significant increase in explained variance. Being single due to insecurities and single by choice remained predictive of significantly higher depression levels with comparable effect sizes across two regression models. However, statistical analysis revealed a full mediation for the effect of being single for freedom was observed, which decreased from $\beta = -.17$ ($p < .05$) to a non-significant $\beta = -.14$. Being single due to interdependency difficulties remained non-significant across both models. Social support was not significant neither as an individual predictor nor as an interaction term with any of the singlehood categories. Therefore, neither

of the singlehood categories benefited from extra social support in reducing the depression levels, however, singles due to insecurities and by choice were more likely to experience depression symptoms regardless of social support they had in their lives. The results of individual predictors can be seen in the table below (Table 18).

Table 18*Multiple Regression Results for Depression*

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.4	.38**
Intercept	9.4	8.56	10.31	.44			
Single for Freedom	-1.33*	-2.5	-.17	.59	-.17		
Single due to Insecurities	4.54**	3.25	5.84	.65	.51		
Single by Choice	2.07*	.49	3.64	.8	.2		
Single due to interdependency Difficulties	.25	-1.53	2.02	.9	.02		
Social Support	-.07	-.14	.01	.04	-.12		
Step 2						.42	.39**
Intercept	9.3	8.37	10.24	.47			
Single for Freedom	-1.06	-2.25	.13	.6	-.14		
Single due to Insecurities	4.68**	3.39	5.97	.65	.53		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single by choice	1.98*	.39	3.57	.8	.19		
Single due to interdependency difficulties	.13	-1.65	1.91	.9	.01		
Social Support	-.05	-.12	.03	.04	-.08		
Single for Freedom	.09	-.01	.19	.05	.16		
× Social Support							
Single due to Insecurities × Social Support	-.05	-.15	.05	.05	-.07		
Social support × Single by choice	-.04	-.18	.1	.07	-.05		
Social support × Single due to interdependency difficulties	< -.001	-.16	.16	.08	< -.001		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Anxiety × Social Support

Step 1. To assess the relationship between singlehood categories, social support and anxiety severity a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 33% ($R^2 = .33$) of the variance in anxiety levels, $F(5, 147) = 15.74, p < .001$. Only being single due to insecurities

emerged as a predictor of significantly higher anxiety levels when accounted for social support. The results of the individual predictors can be seen in the table below (Table 19).

Step 2. A multiple linear regression with an interaction term between singlehood categories and social support levels was conducted to evaluate whether they predicted anxiety levels. The overall model was significant and indicated that singlehood categories and social support explained 37% ($R^2 = .33$) of the variance in PHQ scores, $F(9, 143) = 9.3, p < .001$, however, the inclusion of interaction terms did not result in a significant increase in explained variance. Singlehood due to insecurities remained as the only significant predictor of higher anxiety levels with comparable effect sizes across the 2 models. These findings suggest that this type of singlehood is prone to experience more anxiety symptoms regardless of levels of social support available to them. The results of individual predictors can be seen in the table below (Table 19).

Table 19

Multiple Regression Results for Anxiety

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.35	.33**
Intercept	7.95	7.19	8.72	.39			
Single for Freedom	-.66	-1.68	.36	.52	-.1		
Single due to Insecurities	4.01**	2.88	5.14	.57	.54		
Single by Choice	.6	-.78	1.98	.7	.07		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Single due to interdependency Difficulties	.82	-.74	2.37	.79	.07		
Social Support	-.01	-.07	.06	.03	-.02		
Step 2						.37	.33**
Intercept	7.82	7	8.65	.42			
Single for Freedom	-.53	-1.58	.51	.53	-.08		
Single due to Insecurities	4.09*	2.95	5.22	.57	.55		
Single by choice	.69	-.71	2.08	.71	.08		
Single due to interdependency difficulties	.62	-.94	2.19	.79	.06		
Social Support	.01	-.06	.07	.03	.01		
Single for Freedom × Social Support	.03	-.05	.12	.04	.07		
Single due to insecurities × Social Support	-.03	-.12	.06	.05	-.04		
Single by choice × Social support	.02	-.11	.14	.06	.02		
Single due to interdependency	-.07	-.21	.06	.07	-.08		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
difficulties× Social Support							

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Depression × Locus of Control

Step 1. To assess the relationship between singlehood categories, locus of control and depression severity a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 44% ($R^2 = .44$) of the variance in anxiety levels, $F(5, 147) = 24.53, p < .001$. Being single due to insecurities and single by choice emerged as predictors of significantly higher, while single for freedom – lower depression levels when accounted for locus of control, which was associated with higher levels of depression as an individual predictor. The results of the individual predictors can be seen in the table below (Table 20).

Step 2. A multiple linear regression with an interaction term between singlehood categories and locus of control was conducted to evaluate whether they predicted depression levels. The overall model was significant and indicated that singlehood categories and social support explained 43% ($R^2 = .43$) of the variance in PHQ scores, $F(9, 143) = 13.75, p < .001$, however, the inclusion of interaction terms did not result in a significant increase in explained variance. Single due to insecurities and single by choice remained significant predictors of higher, while singlehood for freedom – lower depression levels, with comparable effect sizes across both models. Higher external locus of control was predictive of significantly higher depression levels, however, did not produce significant interactions with any of the

singlehood categories. This means that although higher external locus of control is overall associated with more severe depression, it does not influence the experience of depression across singlehood categories. However, singles due to insecurities and by choice experience more depression symptoms regardless of whether they believe they are able to influence life outcomes or not, while single for freedom regardless of their locus of control have less depression symptoms. The results of individual predictors can be seen in the table below (Table 20).

Table 20

Multiple Regression Results for Depression

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 1						.45	.44**
Intercept	9.61	8.8	10.43	.41			
Single for Freedom	-1.24*	-2.35	-.13	.56	-.16		
Single due to Insecurities	4.59**	3.4	5.77	.59	.52		
Single by Choice	1.8*	.32	3.33	.76	.18		
Single due to Interdependency Difficulties	.71	-1	2.41	.86	.05		
Locus of Control	.45**	.24	.66	.11	.26		
Step 2						.46	.43**
Intercept	9.56	8.73	10.39	.42			

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single for Freedom	-1.28*	-2.41	-.15	.57	-.17		
Single due to Insecurities	4.52**	3.32	5.72	.61	.51		
Single by choice	1.83*	.3	3.36	.77	.18		
Single due to interdependency difficulties	.82	-.91	2.54	.87	.06		
Locus of Control	.46**	.24	.67	.11	.27		
Single for Freedom × Locus of Control	-.04	-.31	.23	.14	-.02		
Single due to insecurities × Locus of control	-.04	-.32	.25	.14	-.02		
Single by choice × Locus of control	.24	-.14	.63	.2	.09		
Single due to interdependency difficulties × Locus of Control	-.13	-.56	.3	.22	-.04		

Note. *CI* = confidence interval; LL = lower limit; UL = upper limit; * $p < .05$. ** $p < .001$;

Anxiety × Locus of Control

Step 1. To assess the relationship between singlehood categories, locus of control and anxiety severity a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 35% ($R^2 = .35$) of the variance in anxiety levels, $F(5, 147) = 17.33, p < .001$. Only being single due to insecurities and locus of control emerged as individual predictors of significantly higher anxiety levels. The results of the individual predictors can be seen in the table below (Table 21).

Step 2. A multiple linear regression with an interaction term between singlehood categories and locus of control was conducted to evaluate whether they predicted anxiety levels. The overall model was significant and indicated that singlehood categories and locus of control explained 17% ($R^2 = .17$) of the variance in GAD scores, $F(5, 131) = 6.37, p < .001$, however, the inclusion of interaction terms did not result in a significant increase in explained variance. Both single due to insecurities and higher external locus of control remained significant individual predictors of higher anxiety levels, with comparable effect sizes across both models. However, no significant interactions were observed. The results of individual predictors can be seen in the table below (Table 21).

Table 21

Multiple Regression Results for Anxiety

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.37	.35**
Intercept	7.98	7.24	8.71	.37			
Single for Freedom	-.62	-1.62	.38	.51	-.1		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Single due to Insecurities	3.89**	2.83	4.94	.54	.52		
Single by Choice	.48	-.88	1.84	.69	.06		
Single due to interdependency Difficulties	1.02	-.52	2.56	.78	.09		
Locus of Control	.22*	.03	.41	.1	.15		
Step 2						.38	.34**
Intercept	7.95	7.2	8.7	.38			
Single for Freedom	-.53	-1.56	.49	.52	-.08		
Single due to Insecurities	3.95**	2.86	5.03	.55	.53		
Single by choice	.41	-.98	1.79	.7	.05		
Single due to interdependency problems	.98	-.58	2.55	.79	.09		
Locus of Control	.2*	.01	.4	.1	.14		
Single for Freedom × Locus of Control	.03	-.22	.27	.12	.017		
Single due to insecurities × Locus of Control	.13	-.12	.39	.13	.06		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Single by choice × Locus of Control	-.09	-.44	.26	.18	-.04		
Single due to interdependency difficulties × Locus of Control	-.01	-.4	.38	.2	-.003		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; **p* < .05. ***p* < .001;

Prediction 7: Depending on Sex, Social Support Will Moderate the Relationship

Between Singlehood Categories and Mental Health to Different Levels

Depression × Social Support in Men

Step 1. To assess the relationship between singlehood categories, social support and depression severity in men a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 33% ($R^2 = .33$) of the variance in depression levels, $F(5, 56) = 7.07, p < .001$. Only being single due to insecurities predicted significantly higher levels of depression in men when accounted for social support. The results of the individual predictors can be seen in the table below (Table 22).

Step 2. A multiple linear regression with an interaction term between singlehood categories and social support levels was conducted to evaluate whether they predicted depression levels in men. The overall model was significant and indicated that singlehood categories and social support explained 37% ($R^2 = .37$) of the variance in PHQ scores in men,

$F(9, 52) = 4.95, p < .001$, however, the inclusion of interaction terms did not result in a significant change in explained variance. Being single due to insecurities was a significant predictor of higher levels of depression, but the effect size of this variable increased from $\beta = .54$ ($p < .001$) in Step 1 to $\beta = .63$ ($p < .001$) in Step 2, suggesting a suppression effect of 16.7%. Social support was not a significant predictor of depression severity neither as an individual predictor nor as an interaction term with any of the singlehood categories. The results suggest that men who are single due to insecurities are more likely to be depressed regardless of social support and that in men social support does not influence the relationship between mental health across singlehood categories. The results of individual predictors can be seen in the table below (Table 22).

Table 22*Multiple Regression Results for Depression in Men*

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.39	.33**
Intercept	8.67	7	10.35	.84			
Single for Freedom	-2.12	-4.51	.26	1.19	-.26		
Single due to Insecurities	4.79**	2.56	7.01	1.11	.54		
Single by choice	1.27	-1.66	4.19	1.46	.13		
Single due to interdependency difficulties	-.14	-3.16	2.87	1.5	-.01		
Social Support	-.05	-.19	.08	.07	-.1		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 2						.37	.37**
Intercept	8.53	6.53	10.52	.99			
Single for Freedom	-1.66	-4.15	.84	1.24	-.21		
Single due to Insecurities	5.57**	3.19	7.96	1.19	.63		
Single by choice	1.22	-1.99	4.44	1.6	.13		
Single due to interdependency difficulties	-.76	-3.94	2.41	1.58	-.06		
Social support	.08	-.11	.27	.1	.15		
Single for Freedom × Social Support	.14	-.05	.34	.1	.33		
Single due to insecurities × Social support	-.14	-.32	.03	.09	-.18		
Single by choice × social support	.01	-.23	.24	.12	.008		
Single due to interdependency difficulties × Social Support	.06	-.16	.29	.11	.068		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; **p* < .05. ***p* < .001;

Anxiety × Social Support in Men

Step 1. To assess the relationship between singlehood categories and social support and anxiety severity in men a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 27% ($R^2 = .27$) of the variance in depression levels, $F(5, 56) = 5.59, p < .001$. Only being single due to insecurities predicted significantly higher levels of anxiety in men when accounted for social support. The results of the individual predictors can be seen in the table below (Table 23).

Step 2. A multiple linear regression with an interaction term between singlehood categories and social support was conducted to evaluate whether they predicted anxiety levels in men. The overall model was significant and indicated that singlehood categories and social support explained 26% ($R^2 = .26$) of the variance in GAD-7 scores, $F(9,52) = 3.37, p = .003$ however, the inclusion of interaction terms did not result in a significant change in explained variance. For men, only being single due to insecurities was a significant predictor of higher levels of depression, but the effect size of this variable increased from $\beta = .42 (p < .05)$ in Step 1 to $\beta = .46 (p < .05)$ in Step 2, suggesting a suppression effect of 9.5%. The results of individual predictors can be seen in the table below (Table 23).

Table 23

Multiple Regression Results for Anxiety in Men

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.33	.27
Intercept	6.85	5.43	8.28	.71			

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single for freedom	-.86	-2.89	1.17	1.01	-.13		
Single due to insecurities	3.01*	1.12	4.9	.94	.42		
Single by choice	.02	-2.47	2.51	1.24	.003		
Single due to interdependency difficulties	2.4	-.16	4.96	1.27	.22		
Social Support	-.05	-.16	.07	.06	-.11		
Step 2						.37	.26*
Intercept	6.72	4.95	8.48	.87			
Single for Freedom	-.82	-3.02	1.38	1.1	-.13		
Single due to Insecurities	3.36*	1.25	5.46	1.05	.46		
Single by choice	.26	-2.58	3.1	1.41	.03		
Single due to interdependency difficulties	1.74	-1.06	4.54	1.4	.16		
Social support	.01	-.16	.18	.08	.02		
Single for Freedom	.03	-.14	.2	.09	.085		
× Social Support							
Single due to insecurities × Social Support	-.09	-.24	.06	.08	-.13		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single by choice × Social Support	.04	-.16	.25	.1	.08		
Single due to interdependency difficulties × Social Support	-.04	-.24	.16	.1	-.05		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Depression × Social Support in Women

Step 1. To assess the relationship between singlehood categories, social support and depression severity in women a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 42% ($R^2 = .42$) of the variance in depression levels, $F(5,74) = 12.63, p < .001$. Being single due to insecurities as well as single by choice predicted significantly higher levels of depression in women when accounted for social support. The results of the individual predictors can be seen in the table below (Table 24).

Step 2. A multiple linear regression with an interaction term between singlehood categories and locus of control was conducted to evaluate whether they predicted depression levels. The overall model was significant and indicated that singlehood categories and social support explained 44% ($R^2 = .44$) of the variance in depression $F(9, 70) = 7.87, p < .001$, however, the inclusion of interaction terms did not result in a significant change in explained variance. For women, both being single due to insecurities and being single by choice

remained significant predictors of higher levels of depression, with comparable effect sizes across both models, regardless of social support. However, in Step 2 social support emerged as an individual predictor of lower depression levels, with an increase from non-significant $\beta = -.14$ in Step 1 to $\beta = -.23$ ($p < .05$) in Step 2, suggesting a suppression effect of 64.3%. A significant interaction suggested that depression in those single for freedom depends on levels of social support. Simple slopes analysis revealed that women single for freedom were only significantly more likely to experience higher risk of depression symptoms at low levels of social support (-1 SD), $b = -3.3$, $SE = 1.32$, $t(163) = -2.5$, $p = .02$, while mean and high social support (+1 SD) did not produce significant effects. The results of individual predictors can be seen in the table below (Table 24).

Table 24*Multiple Regression Results for Depression in Women*

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 1						.46	.42**
Intercept	9.29	8.07	10.52	.61			
Single for freedom	-.87	-2.5	.76	.82	-.1		
Single due to insecurities	4.68**	2.86	6.49	.91	.51		
Single by choice	3.22*	1.12	5.32	1.05	.28		
Single due to interdependency difficulties	.17	-2.37	2.71	1.27	.01		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Social Support	-.09	-.19	.02	.05	-.14		
Step 2						.50	.44*
Intercept	9.55	8.22	10.87	.66			
Single for Freedom	-1.08	-2.71	5.46	.81	-.12		
Single due to Insecurities	4.56**	2.76	6.36	.9	.5		
Single by choice	3.34*	1.23	5.46	1.06	.29		
Single due to interdependency difficulties	.45	-2.12	3.03	1.29	.03		
Social support	-.14*	-.26	-.01	.06	-.23		
Single for Freedom	.21*	.03	.38	.09	.26		
× Social Support							
Single due to	.02	-.13	.18	.08	.03		
insecurities × Social Support							
Single by choice × Social Support	-.14	-.34	.07	.1	-.14		
Single due to	-.08	-.38	.22	.15	-.05		
interdependency difficulties × Social Support							

Note. CI = confidence interval; LL = lower limit; UL = upper limit; **p* < .05. ***p* < .001;

Anxiety × Social Support in Women

Step 1. To assess the relationship between singlehood categories, social support and anxiety severity in women a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and social support explained 39% ($R^2 = .39$) of the variance in depression levels, $F(5,74) = 11.25, p < .001$. Only being single due to insecurities predicted significantly higher levels of depression in women when accounted for social support. The results of the individual predictors can be seen in the table below (Table 25).

Step 2. A multiple linear regression with an interaction term between singlehood categories and social support was conducted to evaluate whether they predicted anxiety levels. The overall model was significant and indicated that singlehood categories and social support explained 38% ($R^2 = .38$) of the variance in anxiety, $F(9, 70) = 6.37, p < .001$, however, the inclusion of interaction terms did not result in a significant change in explained variance. Singlehood due to insecurities remained a significant predictor of higher anxiety levels across both models with comparable effect sizes. No significant interactions emerged. The results of individual predictors can be seen in the table below (Table 25).

Table 25

Multiple Regression Results for Anxiety in Women

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.43	.39

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Intercept	8.38	7.29	9.46	.54			
Single for freedom	-.46	-1.9	.98	.72	-.06		
Single due to insecurities	4.87**	3.27	6.48	.81	.62		
Single by choice	1.01	-.85	2.87	.93	.1		
Single due to interdependency difficulties	-.34	-2.59	1.9	1.13	-.03		
Social Support	-.03	-.13	.06	.05	-.07		
Step 2						.45	.38**
Intercept	8.42	7.22	9.62	.6			
Single for Freedom	-.58	-2.05	.89	.74	-.08		
Single due to Insecurities	4.83**	3.19	6.46	.82	.61		
Single by choice	1.16	-.75	3.08	.96	.12		
Single due to interdependency difficulties	-.06	-2.4	2.27	1.17	-.01		
Social support	-.05	-.16	.06	.06	-.1		
Single for Freedom × Social Support	.1	-.06	.26	.08	.01		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single due to insecurities × Social Support	.01	-.13	.16	.07	.02		
Single by choice × Social Support	-.1	-.28	.09	.09	-.11		
Single due to interdependency difficulties × Social Support	-.1	-.38	.17	.14	-.08		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Prediction 8: The Relationship Between Singlehood and Mental Health Outcomes Will Be Moderated by Individual's Levels of Sexism Across All Singlehood Categories

Depression × Sexism in Men

Step 1. To assess the relationship between singlehood categories and depression severity in men depending on their levels of sexism a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and sexism explained 36% ($R^2 = .36$) of the depression variance, $F(5, 56) = 7.95, p < .001$. When accounted for sexism, men who were single for freedom experienced significantly lower, while men who were single due to insecurities – higher, levels of depression than the average mean. The results of the individual predictors can be seen in the table below (Table 26).

Step 2. A multiple linear regression with an interaction term between singlehood categories and sexism score was conducted to evaluate whether they predicted depression levels in men. The overall model was significant and indicated that singlehood categories and sexism score explained 41% ($R^2 = .41$) of the variance in depression in men, $F(9, 52) = 5.79$, $p < .001$, however, the inclusion of the interaction terms did not result in a significant change in explained variance. The effect of being single for freedom increased from $\beta = -.31$ in Step 1 to $\beta = -.38$ ($p < .05$) in Step 2, suggesting a suppression effect of 22.6% and the effect of being single due to insecurities increased from $\beta = .63$ in Step 1 to $\beta = .68$ ($p < .05$) in Step 2, suggesting a suppression effect of 7.9%. Both effects remained significant across 2 models regardless of the effect of sexism. However, a significant interaction suggested that depression in singlehood due to interdependency depends on levels of social support. Simple slopes analysis revealed that men single for freedom were significantly more likely to experience a higher risk of depression symptoms at high levels of sexism (+1 SD), $b = 4.33$, $SE = 2.14$, $t(163) = 2.03$, $p = .047$, yet non-significant at low (-1 SD) and mean levels. The results of individual predictors can be seen in the table below (Table 26).

Table 26

Multiple Regression Results for Depression in Men

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.42	.36**
Intercept	9.24	7.66	10.82	.79			
Single for Freedom	-2.49*	-4.74	-.24	1.12	-.31		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single due to Insecurities	5.58**	3.62	7.54	.98	.63		
Single by choice	1.57	-1.18	4.33	1.37	.16		
Single due to interdependency	.46	-2.57	3.5	1.51	.03		
Difficulties							
Sexism	-.2	-.41	.02	.11	-.2		
Step 2						.5	.41**
Intercept	8.65	7	10.29	.82			
Single for Freedom	-3.04*	-5.27	-.81	1.11	-.38		
Single due to Insecurities	6.03**	4.05	8.01	.99	.68		
Single by choice	2.89	-.2	5.98	1.54	.3		
Single due to interdependency	-1.39	-4.63	1.85	1.62	-.1		
difficulties							
Sexism	-.22*	-.43	-.01	.1	-.22		
Single for Freedom × Sexism	.07	-.27	.41	.17	.06		
Single due to insecurities × Sexism	.004	-.23	.24	.12	<.001		
Single by choice × Sexism	-.29	-.72	.15	.22	-.23		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single due to interdependency difficulties \times Sexism	.56*	.12	.99	.22	.31		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Anxiety \times Sexism in Men

Step 1. To assess the relationship between singlehood categories and anxiety severity in men depending on their levels of sexism a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and sexism explained 28 % ($R^2 = .28$) of the depression variance, $F(5, 56) = 5.8, p < .001$. When accounted for sexism, men who were single due to insecurities or interdependency difficulties experienced significantly higher levels of depression than the average mean. The results of the individual predictors can be seen in the table below (Table 27).

Step 2. A multiple linear regression with an interaction term between singlehood categories and sexism was conducted to evaluate whether they predicted anxiety levels. The overall model was significant and indicated that singlehood categories and social support explained 29% ($R^2 = .29$) of the variance in anxiety, $F(9, 52) = 3.81, p < .001$, however, the inclusion of interaction terms did not result in a significant change in explained variance. The only significant predictor was being single due to insecurities, the effect of which increased from $\beta = .5$ in Step 1 to $\beta = .53$ ($p < .05$) in Step 2, suggesting a suppression effect of 6%. Being single due to interdependency difficulties was no longer significant in Step 2, which statistically accounted for the full effect. The results of individual predictors can be seen in the table below (Table 27).

Table 27*Multiple Regression Results for Anxiety in men*

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
Step 1						.34	.28**
Intercept	7.24	5.87	8.61	.68			
Single for Freedom	-1.15	-3.09	.8	.97	-.17		
Single due to Insecurities	3.59**	1.9	5.28	.85	.5		
Single by choice	.29	-2.09	2.68	1.19	.04		
Single due to interdependency difficulties	2.7*	.07	5.32	1.31	.24		
Sexism	-.11	-.29	.08	.09	-.14		
Step 2						.4	.29**
Intercept	6.76	5.29	8.24	.73			
Single for Freedom	-1.64	-3.64	.36	.99	-.25		
Single due to Insecurities	3.82*	2.05	5.6	.88	.53		
Single by choice	1.2	-1.56	3.97	1.38	.15		
Single due to interdependency difficulties	1.83	-1.07	4.74	1.45	.16		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Sexism	-.13	-.32	.06	.09	-.16		
Single for Freedom × Sexism	.04	-.34	.26	.15	-.05		
Single due to insecurities × Sexism	.08	-.12	.29	.1	.1		
Single by choice × Sexism	-.16	-.54	.23	.19	-.16		
Single due to interdependency difficulties × Sexism	.23	.15	.62	.19	.16		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Depression × Sexism in Women

Step 1. To assess the relationship between singlehood categories and depression severity in women depending on their levels of sexism a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and sexism explained 42 % ($R^2 = .42$) of the depression variance, $F(5, 74) = 12.26$, $p < .001$. When accounted for sexism, women who were single due to insecurities or by choice experienced significantly higher levels of depression than the average mean. The results of the individual predictors can be seen in the table below (Table 28).

Step 2. A multiple linear regression with an interaction term between singlehood categories and sexism was conducted to evaluate whether they predicted depression levels in

women. The overall model was significant and indicated that singlehood categories and sexism levels explained 39% ($R^2 = .39$) of the variance in depression, $F(9, 70) = 6.6, p < .001$, however, the inclusion of interaction terms did not result in a significant change in explained variance. Being single due to insecurities and by choice remained significantly predictive of higher levels of depression with the same effect size across two steps of the regression model. The results of individual predictors can be seen in the table below (Table 28).

Table 28*Multiple Regression Results for Depression in women*

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.45	.42**
Intercept	9.25	8.01	10.48	.62			
Single for freedom	-.82	-2.46	.82	.82	-.09		
Single due to insecurities	4.63**	2.75	6.52	.95	.51		
Single by choice	3.36*	1.19	5.52	1.09	.3		
Single due to interdependency difficulties	.12	-2.45	2.68	1.29	.01		
Sexism	.11	-.07	.3	.09	.12		
Step 2						.46	.39**
Intercept	9.3	7.94	10.67	.68			
Single for Freedom	-.86	-2.58	.85	.86	-.1		

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Single due to Insecurities	4.68*	2.74	6.63	.98	.51		
Single by choice	3.42*	1.12	5.73	1.16	.3		
Single due to interdependency difficulties	.21	-2.49	2.91	1.35	.02		
Sexism	.15	-.07	.37	.11	.15		
Single for Freedom × Sexism	-.06	-.3	.18	.12	-.05		
Single due to insecurities × Sexism	-.09	-.42	.23	.16	-.08		
Single by choice × Sexism	.02	-.32	.36	.17	.01		
Single due to interdependency difficulties × Sexism	.16	-.26	.59	.21	.1		

Note. *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; * $p < .05$. ** $p < .001$;

Anxiety × Sexism in Women

Step 1. To assess the relationship between singlehood categories and anxiety severity in women depending on their levels of sexism a multiple regression was conducted. The overall model was significant and indicated that singlehood categories and sexism explained 39% ($R^2 = .39$) of the depression variance, $F(5, 74) = 11.26$, $p < .001$. When accounted for

sexism, women who were single due to insecurities were likely to experience significantly higher levels of depression than the average mean. The results of the individual predictors can be seen in the table below (Table 28).

Step 2. A multiple linear regression with an interaction term between singlehood categories and sexism was conducted to evaluate whether they predicted anxiety levels. The overall model was significant and indicated that singlehood categories and sexism explained 37% ($R^2 = .37$) of the variance in anxiety, $F(9, 70) = 3.34$, $p < .001$, however, the inclusion of the interaction terms did not result in a significant change in explained variance. Singlehood due to insecurities remained a significant predictor with a comparable effect size across 2 steps of the model. The results of individual predictors can be seen in the table below (Table 28).

Table 28

Multiple Regression Results for Anxiety in women

Variable	<i>B</i>	95%		<i>SE</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.43	.39**
Intercept	8.36	7.27	9.44	.54			
Single for freedom	-.46	-1.9	.98	.72	-.06		
Single due to insecurities	4.81**	3.15	6.46	.83	.61		
Single by choice	1.1	-.8	3	.95	.11		

Variable	<i>B</i>	95%		<i>SE</i>	β	<i>R</i> ²	ΔR^2
		LL	UL				
<hr/>							
Single due to							
interdependency	-.38	-2.63	1.87	1.13	-.03		
difficulties							
Sexism	.06	-.1	.22	.08	.07		
<hr/>							
Step 2						.45	.37
Intercept	8.47	7.27	9.65	.6			
Single for Freedom	-.51	-2.01	.99	.75	-.07		
Single due to							
Insecurities	4.9**	3.2	6.6	.85	.62		
Single by choice	1.21	-.81	3.23	1.01	.12		
Single due to							
interdependency	-.37	-2.73	1.99	1.18	-.03		
difficulties							
Sexism	.1	-.09	.29	.1	.12		
Single for Freedom ×							
Sexism	-.07	-.28	.14	.11	-.07		
Single due to							
insecurities × Sexism	-.13	-.41	.15	.14	-.13		
Single by choice ×							
Sexism	.005	-.29	.3	.15	.004		
Single due to							
interdependency	.18	-.19	.55	.19	.12		
difficulties × Sexism							

*Note. CI = confidence interval; LL = lower limit; UL = upper limit; * $p < .05$. ** $p < .001$;*

Discussion

The aim of Study 2 was to replicate and/or build on the results of Study 1. I have supported Prediction 1 that mental health of single people as a homogenous group is not worse than of those in relationships. I partially supported Prediction 2 as single people scored higher on attachment avoidance and lower on mating performance than participants in committed relationships, however, differently to study 1, no significant difference was found between the 2 groups' attachment anxiety and sociosexuality levels. Based on reasons for being single, two of the expected and two new singlehood categories emerged (Prediction 3). Prediction 4 was supported as singlehood categories were associated with different psychological outcomes. Singlehood categories predicted mental health outcomes and cognitive distortions contributed to the understanding of variance as well as partially mediated some of the relationships (Prediction 5). However, predictions 6-8 were only partially confirmed as social support, locus of control and sexist attitudes contributed to the understanding of the relationship between singlehood categories and mental health, but not to the expect extent. The specifics of the findings are discussed below.

Singlehood vs. Relationships

In line with findings of Study 1, there was no significant difference in the scores of anxiety, depression and cognitive distortions levels between people in committed relationships and singles 'as a whole'. Although the samples of both studies had comparable demographical characteristics, descriptive statistics in Study 2 suggested that depression, anxiety and cognitive distortions were elevated (in the case of depression – beyond the clinical threshold) in committed participants rather than singles – which was the case in Study

1. But while these descriptive differences bring attention to the fact that neither of the groups is “universally” happy or not, the lack of significant effects in inferential statistics in both studies strengthens the evidence that comparing singles and those in relationships as two broad categories does not yield meaningful observations. Similarly, I have confirmed that singles score higher on attachment avoidance and lower on mating performance, but contrary to my predictions did not find a significant difference between the 2 groups in terms of sociosexuality and attachment anxiety levels. This might be because attachment styles and sociosexual orientation in singles are subject to variability greater than previously thought and so investigating them as a broad category generates mixed results too.

Singlehood Subgroups

Based on reasons for being single, four singlehood clusters have emerged: single for freedom, single due to insecurities, single by choice, and single due to interdependence difficulties. Singlehood for freedom and singlehood by choice were replicated in line with Study 1 and were defined by similar reasons. Singlehood for freedom was characterised by high emphasis on independence (“*I don’t want anyone to restrict my behaviours*”), low willingness to commit and sacrifice for others (“*I don’t want to answer to anyone*”) and the need for freedom of unrestricted self-expression (“*I want to be free to do whatever I want*”). Singlehood by choice was driven by the need to prioritise other goals in life (“*Right now, I have to prioritise other things in life*”), unfavourable circumstances (“*It’s not the right time for me to be in a relationship*”) and an active choice of being single (“*I choose to remain single for the time being*”). Therefore, while both categories reflected an element of voluntary decision in being single, singlehood for freedom suggested a general attitude of unwillingness towards committed relationships, whereas singlehood by choice – a more current, circumstances-specific preference.

On the other hand, 2 newly emerged categories – singlehood due to insecurities and singlehood due to interdependency difficulties – were defined by internal and external barriers to establishing a relationship. Specifically, singlehood due to insecurities reflected an overall negative view of oneself (“*I don’t think I am worthy of love/that someone could love me*”), and negative predictions for potential future relationships (“*I am single because I fear that my negative aspects will be revealed*”), perhaps due to past experiences (“*I have been rejected too many times*”). Whereas singlehood due to interdependency difficulties suggested challenges specific to connecting and being close to others (“*I find it difficult to be emotionally close to/vulnerable with other people*”), no wish for either long or short-term mating (negative coefficients to “*I want to settle*”, “*I want to be able to flirt around*”) and an optimistic attitude for future dating prospects (“*I think in the future I will be able to attract “better” partners*”).

Subsequent correlational analyses identified distinct patterns of psychological outcomes amongst these singlehood categories, which confirmed that certain types of singles might be predisposed to a more negative experience. Specifically, higher endorsement of singlehood due to insecurities was significantly linked with the severe outcomes on all variables of interest - depression, anxiety, cognitive distortions (including individual items – labelling, selective abstraction and “What if?”), experience of emotional abuse, sociosexuality, attachment anxiety and avoidance. These results were almost mirrored by singlehood due to interdependency difficulties, which showed the same, yet half as strong correlations with all the above except for Labelling. Singlehood by choice was associated with higher likelihood of depression, but not anxiety, more cognitive distortions overall and specific ones such as selective abstraction, higher attachment avoidance, and was the only singlehood category negatively associated with sociosexuality. Finally, singlehood for freedom was only described by higher avoidant attachment and lower attachment anxiety.

Additionally, some of the strongest correlations that emerged were between singlehood types and cognitive distortions. Specifically, singlehood due to insecurities was associated with more distorted patterns of thinking overall and individual cognitive distortions such as labelling, selective abstraction and “What if?”. Similar trends were observed in singlehood due to interdependency difficulties; however, this category was not prone to increased labelling. Additionally, increased levels of distorted patterns of thinking overall as well as tendency for labelling and selective abstraction, but not questioning ‘What if?’, were observed in singlehood by choice. This suggests that while this group of singles might hold a skewed perception of themselves and their experiences, they are less likely to catastrophise, which is further supported by the lack of significant association with anxiety in this group. Differently from other categories, singlehood for freedom was not linked with cognitive distortions suggesting the healthiest cognitive processing.

Singlehood types also differed in terms of their associations with the wider factors impacting mental health. For example, social support was only significantly related to singlehood due to insecurities, suggesting that those who see little worth and mating potential in themselves are much more likely to lack meaningful social support in their lives. Whilst low self-confidence and a gloomy view of oneself might make any form of interpersonal connections difficult and lead to, e.g., reduced interactions with one’s social circle, it is also possible that these attitudes are a result of the limited support and care in the first place. Similarly, the increased tendency to express sexist views in both men and women who are single due to insecurities as well as interpersonal difficulties might be a result of a bi-directional relationship too. Those who hold and express prejudiced beliefs are likely to experience difficulties in attracting partners, which might exacerbate those beliefs in return. However, these attitudes might have been originally evoked due to negative experiences in relational contexts in the first place. Locus of support did not correlate with any singlehood

types, which means that individuals' perception of their reasons for singlehood is not influenced by their overall belief in personal control over life outcomes. The implications of broader factors on the mental health of singlehood categories will be discussed in more detail later.

Thus, similar to the findings of study 1, I have confirmed that endorsement of different reasons for being single is associated with different psychological outcomes, which were driven by also diverse cognitive processes. For example, those who strongly believed that their singlehood was due to their insecurities were the most likely to struggle with mental health as compared with those who chose to be single due to their need for freedom. One reason for that might be because their also elevated levels of distorted patterns of thinking gave rise and/or maintained the negative beliefs they held about themselves and their dating prospects, which inevitably influenced their real-life outcomes too. Additionally, severity of mental health outcomes in singlehood types seemed to differ based on the severity and type of cognitive distortions, e.g., singlehood due to insecurities was associated with the most severe outcomes as well as highest levels of all types of erroneous cognitions, while singlehood due to interdependency issues had lower correlations of both. Most interestingly, however, cognitive distortions and higher risk of depression was also associated with being single by choice, which suggests that even some of those who are single because they actively choose to postpone it, do not escape the negative outcomes of not having a partner. Yet it seemed to be possible if one was single for freedom, which, coincidentally, was not associated with cognitive distortions.

Variance in Mental Health Outcomes

In study 2, I replicated the finding that singlehood types significantly explained variance in singles mental health outcomes. Singlehood due to insecurities and by choice was associated with a significant increase in depression levels, however, the relationship was

attenuated or no longer significant, respectively, when cognitive distortions were added to the regression model. This suggests that depression in those who are single by choice is driven exclusively by cognitive distortions, whereas those who attribute their singlehood to insecurities are prone to experience elevated levels of depression even when more than a third of that effect is explained by their erroneous patterns of thinking. On the other hand, the link between lower levels of depression and being single for freedom remained significant and was not influenced by cognitive distortions. This might be because this category of singles is not likely to experience them in the first place. Endorsement of being single due to insecurities was associated with more anxiety on its own and despite cognitive distortions. However, cognitive distortions attenuated the effect of this predictor by almost half, indicating that a significant proportion of difficulties experienced by this group of singles can be alleviated by addressing their cognitive distortions. Singlehood due to interdependency difficulties was not significantly associated with neither depression nor anxiety, whereas in line with wider research, cognitive distortions were predictive of higher levels of both. Overall, I have supported my prediction that variability in mental health outcomes will be explained by singlehood categories and mediated by cognitive distortions.

Social Support Crucial for Women Single for Freedom

Overall, I found that singlehood due to insecurities and by choice was predictive of higher depression and anxiety levels regardless of social support. When the sample was split by sex, the main effect of both singlehood types remained significant for women, yet men were only likely to experience significantly more depression if they were single due to insecurities. This suggests that social support plays a smaller role in singles' mental health than attributing one's relationship status to insecurities or choice, which significantly predicts higher depression and anxiety levels on its own both in the overall sample and men and women separately.

The main effect of singlehood for freedom was associated with a decrease in depression in a full sample irrespective of social support. However, women who were single for freedom were significantly more likely to experience depression symptoms at low rather than mean or high levels of social support. This might be because, from an evolutionary perspective, (endorsement of) an unrestricted sexual lifestyle increased woman's likelihood to become pregnant, which without a committed partner was especially dangerous when also lacking other traditional sources of care and support – strong social connections.

Limited Benefits of Locus of Control

Although contrary to the predictions, locus of control did not moderate the relationship between singlehood categories and mental health, an average single who had a stronger external locus of control was more likely to have higher depression and anxiety levels regardless of their singlehood category. However, even when controlled for locus of control, higher endorsement of singlehood due to insecurities was predictive of higher levels of depression and anxiety, singlehood by choice with higher levels of depression and singlehood for freedom with lower levels of depression. This suggests that having an internal locus of control is beneficial to the mental health of singles overall, but it does not offer any additional benefits specific to singlehood types, which further emphasizes the influence of endorsed singlehood reasons in shaping mental health outcomes.

Sexism Aggravates Interdependency Difficulties in Men

Finally, levels of sexism did not exacerbate women's mental health across any of the singlehood categories. However, women single due to insecurities were more likely to have higher depression and anxiety, and single by choice higher depression levels regardless of their attitudes about men. The relationship between sexism and mental health outcomes was more nuanced in men. Firstly, men were more likely to be more depressed and anxious if they

attributed their singlehood to insecurities and less depressed if they were single for freedom, regardless of their levels of sexism. However, high levels of sexism exacerbated depression in men single due to interdependency difficulties, suggesting that men who are single due to difficulties with emotional intimacy are more likely to be depressed if they hold highly sexist beliefs too. This finding complements the research on incels as they hold sexist attitudes, are significantly more likely – just like singles due to interdependency difficulties in this study – to experience higher levels of insecure attachments and have poor mental health.

Overall, results suggest that mental health outcomes in singlehood are significantly explained by singlehood categories. Singlehood due to insecurities, in particular, is strongly associated with a higher risk of depression and anxiety, which is not influenced by locus of control, and equally prominent in both men or women regardless of the level of social support in their life or sexist attitudes. However, the relationship between this singlehood category and poor mental health outcomes is partially attenuated by cognitive distortions, which suggests that challenging distorted beliefs might improve wellbeing of those who relate to this category the most and potentially address the barriers they face in regards forming relationships altogether. The influence of cognitive distortions is especially evident in those who choose to be single, as this category no longer predicts depression and anxiety when erroneous beliefs are taken into account. This might be because, as mentioned before, some people hold onto distorted beliefs about their situation as a way of managing distress. For example, in some singlehood circumstances people might say they choose to stay single to focus on their work or education, when in reality they do so to distract themselves from loneliness.

Additionally, I have identified that singlehood due to freedom is associated with the most positive mental health outcomes, which are not influenced by cognitive distortions, locus of control and in men – levels of sexism. This suggests that people who report that they

are single mostly due to their choice to be independent and live an unrestricted life, enjoy the best wellbeing as compared with other singlehood categories. However, this was not the case for women single for freedom who were at risk of higher depression levels if they had low levels of social support available to them. Finally, singlehood due to interdependency difficulties contributed to the understanding of the variance in the mental health of singles very little. However, in men this was the only category where depression scores were significantly influenced by high sexism levels. These findings highlight that while mental health in singlehood might be mostly dependent on individual's view of the reasons behind their relationship status, the influence of social support, locus of control and gender attitudes remain highly significant in certain experiences of singlehood.

Implications

In this study I have replicated the finding that singlehood consists of distinct sub-groups based on people's reasons for being single, which are characterised by unique psychological profiles. This highlights that the study of singlehood requires careful consideration for the within-group variability as average findings are non-representative. Initially observed in the diverse correlations between singlehood clusters and the range of mental health factors, this heterogeneity became even more apparent in regression analyses investigating the variance in mental health. For example, I found that two categories of singlehood reasons – singlehood due to insecurities and singlehood for freedom; are predictive of opposite wellbeing outcomes, i.e., singlehood due to insecurities was related to elevated, whereas being single for freedom to lower risk of mental illbeing. However, as I have demonstrated in initial analyses, when studied all together, psychological outcomes of singles appear comparable to those in relationships. Therefore, my approach allows for more insightful and representative findings and has the potential to explain the mixed findings in past literature.

Moreover, I have confirmed the role of cognitive distortions in the experience of singlehood. Cognitive distortions were found to contribute and – in the case of depression in singlehood by choice – fully explain the relationship between singlehood categories and mental health outcomes. Similarly, the elevated levels of both depression and anxiety observed in those single due to insecurities were accounted by cognitive distortions by almost 50%. Considering the vast evidence of cognitive distortions being successfully challenged through therapeutic work (Ebrahimi, Moheb & Alivani Vafa, 2024; Kürümlüoğlugil & Tanrıverdi, 2022), my findings offer a pathway for alleviating psychological distress experienced by singles most likely to experience it.

Similarly, I have demonstrated that although the wider factors such as social support, locus of control and sexist attitudes play a smaller role in the wellbeing of singles than initially thought, these factors are still influential. For example, locus of control did not moderate the experience of specific singlehood types, yet externality was still linked with better wellbeing regardless of what singles attributed their relationship status to. On the other hand, social support was especially crucial for certain singles, specifically, women who stayed single for freedom, potentially as a protective factor in the case of pregnancy. Similarly, while sexist attitudes did not significantly contribute to the wellbeing of majority of singles, men who were without a partner due to interdependency difficulties were more likely to be depressed if they experienced high levels of sexist beliefs.

Finally, my findings suggest that the singlehood reasons cluster together not only because they are similar, but that they also meaningfully translate into real life outcomes. While it is unlikely that a singlehood reason attributed to a specific singlehood category will fully translate to a corresponding experience, it is worth noticing and highlighting the implications of some of the generated items emerging within categories different from what I expected. For example, I predicted “*I want to work on myself first before I start dating*” to

emerge within the singlehood by choice as an expression of working on oneself to increase one's mating value/mating prospects. However, this reason has emerged within the singlehood due to insecurities, which suggests that those who relate to that cluster of reasons not only perceive themselves as less of a mate (as expressed by other reasons within this cluster, e.g., *"I don't think I am worthy of love/that someone could love me"*) and experience poorer mental health outcomes, but are also more likely to actively postpone any attempts at relationship formation. Therefore, my findings explain how certain cognitions not only contribute to specific psychological outcomes, but might also translate into mating dynamics, which is undeniably consequential to real life outcomes.

Limitations

My battery of singlehood reasons lacked items describing not having a partner due to (recent) relationship dissolution, and singlehood due to end soon, i.e., singlehood in-between relationships. These are important to distinguish because mental health of people who see their singlehood as a transitory period might be significantly influenced by their recent experiences, e.g., low mood due to recovering from a breakup or conversely – excitement about going on dates with someone new. In fact, this type of singlehood has been previously identified as distinct from long-term or involuntary singlehood and was characterised by wellbeing and mating outcomes comparable to those in relationships, for example, higher mating performance and wellbeing (Apostolou et al., 2024; Apostolou, Papadopoulou & Georgiadou, 2019). Therefore, we might have missed out on the opportunity to assess the experiences and, especially, patterns of thinking, of those who perceive singlehood as a temporary circumstance rather than choice, identity or constraint. Additionally, in correlational analyses, I have not applied multiple comparisons corrections, risking higher chance of type 1 error and potentially identifying significant relationships where there was no true effect.

Chapter 4: General Discussion

This study investigated mental health in singlehood based on individuals' reasons for being single. Whilst as a 'whole' singles and non-singles' wellbeing was comparable, significant differences were uncovered by acknowledging the heterogeneity of singlehood motivations. Reasons that people attribute their relationship status to were found to form unique singlehood clusters, characterised by distinct psychological profiles and predictive of mental health outcomes. Cognitive distortions were found to explain a significant proportion of the mental health effects observed in certain types of singlehood, whereas the influence of wider factors such as social support, locus of control and sexism was less strong than predicted.

Findings

The still-prevalent view of singlehood as a less fortunate way of living, defined by numerous disadvantages across multiple life domains (DePaulo & Morris, 2005; Byrne & Carr, D., 2005), stems from the long running tradition of relationship research categorising individuals as married or non-married (Haring-Hidore et al., 1985; Emery, Horn & Beam, 2012; Wade & Pevalin, 2004) as well as lack of attempt to examine the experiences within this category of people. Following on from the recent efforts to address these issues, I have confirmed that assessing singles as a homogenous group is an approach far too simplistic and inadequate for social groups characterised by a spectrum of experiences. Across both studies, I have confirmed that those in relationships outperform singles in terms of mating performance and (in Study 1) showed that they have lower levels of sociosexuality, highlighting some broad differences between those with and without a partner. At the same time, in both studies I have demonstrated that mental health effects in singlehood correspond with specific singlehood circumstances as defined by individual reasons for being single.

Considering the lack of consensus in previous research that attempted to categorise singlehood, as well as the restrictive nature of using pre-designed categories, I drew on the work of Apostolou (2017) to develop my own battery of singlehood items and assess what singlehood clusters emerged within my sample. This way I identified that singlehood motivations include biding one's time and prioritising other life areas, being single for unrestricted freedom and opportunistic sexual relationships, and singlehood imposed by personal circumstances. By using a larger battery of items in Study 2, I uncovered that what I originally named singlehood due to problems is a broader category consisting of singlehood due to insecurities and singlehood due to interdependency difficulties. This discovery highlighted that when singlehood is attributed to barriers rather than choice or preference, inter- and intrapersonal difficulties emerge as unique domains with distinct effects. Across both studies, the biggest effects were observed for singlehood circumstances defined by inability to establish or maintain a relationship, which in itself indicates a more pessimistic and powerless attitude and in line with past research on involuntary singlehood (Apostolou et al., 2019), was characterised by higher levels of depression and anxiety than other types of singlehood.

While the diversity of psychological profiles of singlehood types was evident when comparing them with committed relationships, the effects unravelled to an even greater extent when psychological profiles of emerged clusters were investigated in relation to one another. For example, in Study 1, I found that singlehood due to problems was associated with levels significantly higher than those observed in singlehood by choice in terms of both depression and anxiety, cognitive distortions and significantly higher than in relationships in terms of depression, selective abstraction and insecure attachment styles. The strongest associations with psychological distress and interpersonal difficulties were then replicated by singlehood due to insecurities and singlehood due to interdependency difficulties that emerged in Study

2, effectively highlighting that the popular belief in the major wellbeing disadvantage attributed to singlehood is a generalisation of what is experienced by only a subsection of singles. However, I have identified that singlehood by choice – although to a lesser extent – was still significantly associated with higher rates of depression, avoidant attachment, cognitive distortions. On the other hand, singlehood for freedom was significantly associated only with lower rates of attachment anxiety and higher attachment avoidance, yet it did not correlate with specific mental health outcomes.

The link between endorsement of specific reasons for singlehood and mental health outcomes was confirmed by regression analyses, as singlehood types were found to independently explain variance in mental health – both when compared to peers in relationships and across singles exclusively. Singlehood due to perceived barriers (singlehood due to problems in Study 1 and singlehood due to insecurities in Study 2) emerged as the strongest predictor of depression and anxiety and was followed by singlehood by choice, while singlehood for freedom was predictive of lower risk of these conditions. While some past research has compared the experiences of different types of singles, my findings support the diversity of specifically mental health - not just emotions or subjective experiences such as satisfaction (Apostolou et al., 2019; Watkins, Beckmeyer & Jamison, 2024). They also provide evidence that singlehood clusters can significantly predict specific patterns of experience, and that these effects are continuous, e.g., how much one attributes their singlehood to a particular cluster corresponds with depression or anxiety levels. In this way, my research not only highlights the need for, but – as I will discuss in more detail later – offers a starting point for developing a framework for alleviating psychological concerns experienced by singles.

Not all of the observed patterns were immediately clear and straightforward to understand. For example, the disadvantaged position of being single due to insecurities was evident both in the statements describing this cluster, e.g., *“I don't think I am worthy of*

love/that someone could love me” and the associated characteristics and experiences, including past emotional abuse and lower levels of social support. But the opposite effects seen in singlehood for freedom, which was not significantly associated with any variables of interest but insecure attachment styles, made the positive outcomes of this cluster curious. Similarly, the psychological profile of interdependency singlehood closely mirrored insecurities, yet it did not explain variance in singlehood’s mental health at all. Finally, singlehood by choice, defined by inconspicuously neutral items, e.g., “*Right now, I have to prioritise other things in life*”, was associated and predictive of worse mental health outcomes. To better understand these differences, I have investigated a previously unexplored potential mechanism behind these experiences – cognitive distortions.

Cognitive Distortions

Singlehood types were characterized by significantly different levels and patterns of cognitive distortions. Again, it was singlehood due to interpersonal problems (in Study 1) and singlehood due to insecurities (in Study 2) that demonstrated the highest positive correlations with erroneous patterns of thinking, whereas singlehood for freedom was not associated with this variable at all. Interestingly, singlehood for choice was also associated with higher rates of cognitive distortions. There was also a difference in specific types of distorted thinking that singlehood types were characterised by, e.g., singlehood due to insecurities showed higher levels labelling, selective abstraction and ‘What if’, yet labelling was not a concern in interdependency singlehood and singlehood by choice was not associated with ‘What if?’.

It is important to hold in mind that the cross-sectional design of this research does not allow to demonstrate causality and as such it is impossible to claim whether higher levels of cognitive distortions experienced by some singles lead to higher levels of psychological distress or alternatively – specific singlehood circumstances, such as singlehood due to

insecurities, contribute to unhealthy patterns of thinking, which then develop into clinical symptoms of anxiety and/or depression. This difficult to untangle relationship is similar to that of past research linking higher life satisfaction and entering marriage (Stutzer & Frey, 2006), and general wellbeing (Kramer et al., 2026) and personality traits often associated with positive affect such as extroversion with shorter spells of singlehood (Apostolou & Tsangari, 2022) as well as relationships serving as a major source of subjective wellbeing, i.e., happiness (Diener & Seligman, 2002). Essentially, raising the question – do less happy people (or in our case – people with more cognitive distortions) experience a self-reinforcing cycle? That is, does psychological distress increase the likelihood of being single, which then exacerbates that distress even further, creating a double-edged process, which is particularly difficult to escape.

Nevertheless, considering cognitive distortions' role in wellbeing (Shi, Zhang & Lei, 2025), their higher rates in singlehood predictive of worse mental health outcomes is unsurprising. My results demonstrate that the difficulties experienced in specific singlehood circumstances are, in fact, substantially or even fully mediated by distorted patterns of thinking. For example, depression in singlehood was fully accounted for by cognitive distortions, while in the case of singlehood due to insecurities, cognitive distortions explained almost half of both anxiety and depression effects (39.2% and 46.3, respectively). While these findings need to be interpreted with caution and it is premature to suggest any causal links due to the methodological restrictions of cross-sectional analysis discussed earlier, our results still highlight the significant contribution that one's patterns of thinking have on their experience of singlehood overall, while variance in *specific* distortions might help understand the difference in mental health outcomes between seemingly similar types of singlehood. For example, singlehood due to interdependency was not associated with higher rates of labelling, unlike singlehood due to insecurities. This suggests that adopting a particularly negative view

of oneself is especially critical to mental health in singlehood, as supported by the latter predicting greater psychological difficulties. Given that relationship success has been linked with confidence and self-esteem, the self-handicapping influence of labelling is unsurprising (Luciano & Orth, 2017; Riggio, et al., 2013).

Wider influences

The impact of cognitive distortions was much greater than the effects of other wider factors I assessed in this study – social support, locus of control and sexism. This potentially suggests that how one *thinks* about themselves and how they *perceive* their situation is more important than what their situation *is* truly like. This idea was partially supported by the overall advantage of having an internal locus of control, meaning that the belief in personal control over life events associated with generally better life and health outcomes is also beneficial in singlehood (Rotter, 1966; Van Liew, 2020; Ng, Sorensen & Eby, 2006). However, there were also circumstances that exacerbated mental health difficulties in specific singlehood types in unique ways. For example, even though sexism did not predict depression or anxiety in singlehood on its own, at high levels it was significantly consequential for those who struggled with intimacy, providing evidence that the link between poor mental health and sexist beliefs already observed in extreme form of singlehood – incels, is also prominent within the general population. Similarly, no independent effect of social support emerged, yet it was especially critical for women who attributed their singlehood to freedom, as at low levels it was significantly predictive of higher rates of depression.

Although I was unable to fully confirm my prediction that social support, locus of control and sexism moderate the relationship between singlehood types and their mental health outcomes in unique ways, these factors might still be contributing to the experience of

singlehood is difficult to capture, in indirect ways. Individual circumstances and characteristics shape individuals' cognitions, which in turn – as seen in the case of cognitive distortions – influence the experience of singlehood. While it might be that due to having used a self-report measure, the negative association that I found between singlehood due to insecurities and social support, has captured that this circumstance of singlehood is also characterised by difficulty to trust or notice the available social support. However, it might be also indicative of the fact that people are more likely to develop negative self-beliefs when lacking strong social connections or alternatively – connecting with others might be more difficult for those with a negative self-attitude. Both of which have already been explored in research (Harris & Orth, 2020; Leary & Baumeister, 2000; Tsai, & Reis, 2009; Leonova, et al., 2021), but in the context of singlehood, this association is especially critical as lack of opportunity or ability to maintain meaningful social interactions also curbs one's pool of potential mates. Therefore, singlehood research would benefit from a better understanding of the extent to which some singles' challenges in establishing relationships stem from general difficulties within the social context, and investigating the effectiveness of corresponding interventions, such as promotion of healthy attitudes and social skill building, on mating behaviours (Hielscher, 2021).

Theoretical Implications

The evolutionary perspective of mental health in singlehood argues that psychological distress experienced by those without a partner is an adaptation meant to enhance relationship formation (Apostolou, 2017; Buss 2016). While I acknowledge that having used cross-sectional data my results speak largely of psychological and social processes not direct psychological mechanisms, they are aligned and extend this theoretical framing by providing evidence that the highest distress is experienced by those who experience the highest adaptive risk, i.e., those who feel unable to form relationships and attribute this to personal

shortcomings. On the other hand, those who are able to access short-term partners, which ensures mating opportunities and evidences high overall mating success, can thrive even outside committed relationships. In the middle of this spectrum exist singlehood circumstances, where mental health outcomes are less reflective of one's success in the mating competition, but rather individual's mental disposition.

Building on the theory of different motives for singlehood (Apostolou, 2017) as confirmed by the extensive list of reasons identified in past research (Apostolou, Jiaqing & Esposito, 2020; Apostolou, 2019), I demonstrated that mental health across different singlehood types corresponds with outcomes expected from the evolutionary perspective. For example, circumstances under which people attributed their singlehood to difficulties in the intersexual competition, i.e., perceiving themselves as having lower mating potential, and/or struggles to outcompete others in the intrasexual competition – singlehood due to insecurities, was predictive of worse mental health and characterised by corresponding qualities such as lower mating performance. The opposite effect was noted when due to preference against committing to one individual and/or the ability to attract partners easily, current mating prospects were less of a worry as seen in singlehood for freedom. Most interestingly perhaps, singlehood by choice, which was previously attributed the adaptive function of enhancing one's mating prospects (Apostolou, 2017), was still associated and predictive of worse mental health outcomes. This highlights that a personal decision to focus on other areas of life offers some, but not full protection against the wellbeing risks of not being in a relationship. And – considering that the effect was not moderated by social support – suggests that the advantages of having a partner are unique and not compensated for even by strong social connections (Boucher, et al., 2016).

I have assessed the impacts of wider factors expected to shape the experience of mental health in singlehood due to their role in general mental health, which led me to

discover that singlehood types were predictive of corresponding mental health outcomes regardless of social support, locus of control and sexism. This confirmed that personal evaluation of singlehood circumstances plays the deciding role in wellbeing and supported the finding that mental health outcomes in singlehood types correspond and are significantly explained by cognitive distortions. Although no research so far has attempted to investigate mating-specific distortions in singlehood, given the pervasiveness of dysfunctional cognitive patterns (Ingram, Miranda & Segal, 1998), I speculate that some of the beliefs held by, for example, people who endorse singlehood due to insecurities, are not necessarily true and thus self-handicapping.

Rigid patterns of thinking as underpinned by cognitive distortions are associated with various forms of interpersonal difficulties, including higher rates of conflict (Fincham & Beach, 2010) and social anxiety (Yoon & Zinbarg, 2007), which may be experienced within the context of singlehood too. For example, elevated levels of ‘What if?’ might make people fearful of taking risks required to attract a partner (Turner, 2024). Similarly, individuals prone to selective abstraction might let one bad date define their self-worth and demotivate them to try again (Weems et al., 2001). On the other hand, the risks of labelling can sometimes be less obvious when instead of “*There is something wrong with me...*” or “*I don’t think I am worthy of love*” as seen in singlehood due to insecurities, it is innocent remarks such as “*I am a career person*” that people attribute their choice to stay single to. And if – as seen in this study – personal cognitions are more influential than wider circumstances, the cultural and societal changes that might make it seem like establishing a relationship in today's world should be easier, have little or even a negative effect (Apostolou, 2015).

In fact, we might be more predisposed to cognitive distortions because our minds have not evolved to navigate our modern environments (Tooby & Cosmides, 1990). For example, simultaneous abundance of choice, but also rejections on dating apps, the seeming

self-sufficiency and ability to navigate the world without the wider circle, whilst still being affected by the lack of meaningful connections, are just two examples of mismatched circumstances that inevitably contribute to adverse psychological experiences and shape new beliefs. Considering simply exposure to specific narratives has the power to influence our attitudes (Renstrom & Back, 2024; Arnocky, Woodruff & Schmitt, 2016) and the rise of social media commentators on dating, who due to controversy generating the most views and engagement, promote distorted and exaggerated relationship dynamics (Taba et al., 2020; Ribeiro et al., 2021) – the overwhelming effect that cognitive distortions have on the wellbeing of singles, stresses the need to investigate how people mentalise their mating successes and losses because, as I have demonstrated, directly or indirectly these internal workings are more impactful than anything else.

Practical Implications

In both studies, I have demonstrated that investigating singlehood as a ‘whole’ creates a non-representative average and ignores the spectrum of experiences that are the reason behind some of the mixed findings in the literature so far. If future studies adopt my approach, better, more representative research will be produced, which will potentially fill the current gaps in our understanding of singlehood experiences on a theoretical level. However, my research provides practical implications too. Namely, the use of mental health screening tools confirms that singlehood can be a risk factor for mental health, with specific circumstances identified to be characterised by symptoms of mental illness exceeding clinical thresholds.

My findings also offer a framework for identifying those that are the most likely to suffer negative wellbeing in singlehood as well as tools for supporting such individuals. At the very basic level, my measure could be used as part of mental health assessments to

prompt a more in-depth conversation about relationships. However, it is important to keep in mind potential ethical issues around identifying ‘higher risk’ singlehood, which would need to be addressed before any such tools can be responsibly used in practice. As the first step our measure requires further replication in more diverse samples and subsequently its functionality and effects assessed in controlled clinical or counselling settings. Even then, it would need to be carefully applied by trained specialists at their own discretion and by carefully weighing up the benefits of psychoeducation compared with potentially triggering context of singlehood and increased risk of stigma in their clients. At its current stage, the measure is not suitable to be applied in therapeutic contexts, but lays the groundwork for developing a tool that could aid the formulation of individuals’ difficulties in the future.

The discovery of the substantial role that cognitive distortions play in the wellbeing of singlehood offers a promising avenue for alleviating distress and potentially even improving mating success. For example, if half of the variance in depression and full effect of anxiety in singlehood due to insecurities is explained by erroneous beliefs, then addressing them and fostering healthier perspectives in individuals endorsing these reasons is expected to help combat the associated symptoms of mental illbeing. Cognitive distortions are primarily discussed within the context of CBT; however, they have also been successfully targeted by other forms of interventions, including psychoeducation (Sajadizadeh, Khademi & Etemadina, 2024; Ebrahimi, Moheb & Alivani Vafa, 2024; Kürümlüoğlugil & Tanrıverdi, 2022). This highlights the importance of educational opportunities about the common mental errors, especially for those unaware that choosing against meaningful close relationships is impacting their mental health, as seen in singlehood by choice.

Considering that cognitive distortions are the basis of any inflexible thinking, better understanding of them, would be helpful across the board, but also in specific cases, such as singlehood driven by sex stereotypes and sexism. Additionally, it might help to address the

unhealthy attachment styles characteristic of singlehood for freedom, which despite being predictive of the best mental health outcomes when compared with other singlehood types, might still lead to negative consequences in the future that I was unable to assess through cross-sectional research. Of course, people should not be pushed to pursue relationships as a way of protecting themselves from long-term risks of not having a partner, however, educating the public and especially clinicians to recognise the risk factors and ways of alleviating them, has the potential to improve the lives of many people whose distress stems from their singlehood experiences.

Finally, a better understanding of how non-uniform the experience of singlehood is, might help to finally dispel the historical stigma associated with being without a partner, which despite the growing recognition for advantages of a single lifestyle, is still vast (DePaulo & Morris, 2005; 2006; Hancock, 2017). These attitudes might stem from our evolutionary striving for the care and protection that having a partner offers, causing us to feel feelings of concern or even superiority towards those unable to achieve it. Yet, both in our ancestral environments and especially current worlds being single is not synonymous with many negative stereotypes that single people face (Girme, Park & MacDonald, 2023; Apostolou, 2017). Educating people on these issues might help alleviate the distress of those whose distorted beliefs make it difficult for them to enter a relationship or – for the same reason – are unwilling to. While in many cases it is difficult to identify which came first – bad mental health or inability to form a relationship, there is plenty of research to confirm that poor mental health is considered unattractive (Boysen, 2019; 2022; Buss et al., 1990), stigmatised (Stuart, Arboleda-Flórez & Sartorius, 2014), and purposely concealed by those trying to attract a partner (de Jager & van der Merwe, 2018). Therefore, addressing general prejudice and misconstrued beliefs as in the case of cognitive distortions can be an efficient way of promoting mental health and simultaneously enhancing relationship formation.

However, this can only be achieved if, moving forward, scientific community acknowledges the diversity within singlehood and commits to producing representative research.

Strengths and Limitations

Besides acknowledging the heterogeneity in singlehood experiences based on reasons for being single, this is one of the limited research projects that acknowledged that being in a committed non-marital relationship is not equivalent to being single. And although initially (due to methodological constraints of Study 1), I have grouped singles into singlehood categories based on their primary reason for being single, noticing the limitation of this approach led me to adjust my methodology and investigate the impact of singlehood reasons clusters on a continuous level, which helped avoid the potential for response bias and acknowledged that people can attribute their singlehood to a range of reasons at any given time. The structure of my research allowed me to smoothly transition from a broad investigation of factors relevant to the study of singlehood to a more focused examination of specific effects. By running two complementary studies, I was also able to replicate some of my initial results, confirming that the observed findings extend across different samples. Finally, grounding my research in a theoretical framework of evolutionary psychology, provided direction and aided the understanding of mechanisms, previously unexplored in largely theory-barren area of research.

Although my work lays a strong foundation for future research, it is not without limitations common within this area of study. To begin with, despite having reached the participant number thresholds for my analyses to be statistically meaningful, I acknowledge that both of my samples were predominantly Western Educated Industrialised Rich and Democratic (WEIRD) and, therefore, recognise the need for replicating my results in bigger and more diverse cohorts. Convenience samples, e.g., undergraduate students, are widely utilised in psychological research (Henrich et al., 2010), which was the case in my thesis as

well, especially, Study 1, where internal university participant recruitment pool was used. Therefore, it is important to take into account that findings true to samples of young adults from backgrounds that have allowed them to pursue higher education might not be generalisable to older populations, those with low SES and from non-Western contexts. For the same reason, the identified singlehood typology and its links to mental health require replication in more diverse and even targeted samples.

Whilst I referred to the concepts of mismatch as a theoretical explanation for why certain wider factors might be critical to singlehood, especially specific types of it, it is important to acknowledge that, as outlined by Goetz et al. (2019) in a phenomenon known as STRANGELY WEIRD samples (i.e., influenced/characterised by: Social media, Temporary Relationships, Relocatable, Autonomous, Nulliparous, Group Segmentation, Educational Setting, Lots of Options, Young), there are other factors that impact modern mating, which make it increasingly difficult to distinguish and assess implications unique to singlehood itself rather than the combined effects of singlehood and influences shaping it. I have also not distinguished effects specific to those in-between relationships as well as unique social categories such as widowhood, which past research has characterised by wellbeing outcomes comparable to committed individuals or significantly higher rates of mental health disorders, respectively (Apostolou, Papadopoulou & Georgiadou, 2019; Jiang, Song, H & Shi, 2023).

Finally, while my study recognises that singlehood is diverse and confirms that wellbeing outcomes differ, it does not assess how these effects compare when diversity in relationship experiences is taken into account too. The historical view of the unfortunate experience that singlehood is often reduced to (Pickens & Braun, 2018) paired with research suggesting that it is relationships that dictate our wellbeing (Waldinger & Schulz, 2023; Holt-Lunstad, Smith, & Layton, 2010), can make it seem like people should seek out and stay in relationships at all costs. However, such approach does not take into account that not only

partnered individuals still experience anxiety and depression, but that relationships are not uniform and contribute to people's happiness, satisfaction, and mental health in a variety of ways, including experiences so severe that they push people to actively choose singlehood (Apostolou & Michaelidou, 2023; Apostolou, 2017). Due to constraints of my study, I have not compared different singlehood types with different relationship circumstances, yet I recognise that doing so would likely lead to the effects observed in singles whose mental health differed from those in relationships (as shown in Study 1) being even more pronounced. A within-groups approach would be also useful in investigating how and whether these groups differ at similar levels of satisfaction with their relationship or singlehood, which could help identify the benefits of having a partner, the lack of which contributes to worse mental health even in singles who choose this way of living.

Future Research

Future research should take into account my findings and aim to replicate them in bigger, more representative samples as well as cross-culturally. Doing so will help establish how much of the singlehood phenomenon is universal, how strong are the implications of mismatch and whether communities characterised by mating practices closer to those of ancestral ones, support or reject my theoretical framework. While finding or accessing such samples might be difficult, western vs. eastern or individualist vs. collectivist cultures might serve as a proxy for comparing modern and more traditionalist ways of living (Bejanyan, Marshall & Ferenczi, 2015). Moreover, I have found that the effects of singlehood types emerged even when controlling for age and sex, however, these factors play a major role in the mating psychology overall (Buss, 1989) and have been associated with unique singlehood outcomes, including differences in singlehood reasons (Apostolou, 2017). For example, women's mating success is closely linked with fertility, therefore, future research could assess whether age exacerbates mental health effects associated with specific singlehood

circumstances, e.g., considering oneself unable to form a relationship, by amplifying the danger signal – psychological distress, as the adaptive risk rises. Because the focus of this study was to distinguish and characterise specific singlehood types, for which I have used a broad range of variables, I have decided against including additional factors to my models. This was due to both the statistical implications and the limited scope to meaningfully explore potential effects, which I suggest could be addressed by future research.

Moreover, the cross-sectional design of my study did not allow to investigate the long-term effects and potential transitions between the singlehood types. For example, positive affect is associated with better mating outcomes (Berrios, Totterdell & Niven, 2015; Lyubomirsky, King & Diener, E, 2005), making singlehood for freedom, which is associated with the best mental health, the most likely to progress into relationships. However, the seeking of unrestricted and uncommitted experiences, paired with higher levels of insecure attachment styles, might also lead to a higher number of negative interpersonal experiences (Haggerty, Hilsenroth & Vala-Stewart, 2009; Mikulincer & Shaver, 2003) causing people to reject the idea of being in a relationship altogether. Similarly, interdependency singlehood might be *only labelling away* from becoming singlehood due to insecurities, which could happen with time, as people internalise and attribute their difficulties with interpersonal connection to faults of personal character. It is also unknown whether singlehood by choice eventually leads to disillusionment or do improved mating prospects contribute to relationship formation, which then outweighs the short-term implications of being without a partner. Longitudinal research is needed to identify and tease apart these potential interactions and influences.

Finally, I have started exploring the influences of cognitive distortions, which offers a promising avenue for both better understanding and supporting mental wellbeing in singlehood. However, we do not know if cognitive distortions experienced in singlehood

associated with the most psychological distress are general or mating-specific. While both is likely, better understanding of what it is exactly that people misjudge about themselves and their situations in the context of singlehood, could help develop support targeted to specific singlehood circumstances. For example, research has identified that incels hold untrue beliefs about mating preferences, specifically the value that women place on attractiveness and earning potential (Costello et al., 2024), which clearly emphasises the risk associated with this prejudiced outlook. Therefore, it would be useful to understand what erroneous beliefs about relationship formation are experienced by the wider population too.

Conclusion

Despite the long-running tradition of singlehood being perceived as the less-fortunate social standing and associated with worse health outcomes, being without a partner is steadily becoming a more normative and even preferred living arrangement. The divide is still present within research and is especially exaggerated in popular culture, with two opposing camps co-existing: one describing the empowering effects of living solo, another arguing the disadvantages of it. I have demonstrated that a generalised view ignores the fact that not all singlehood looks the same and identified that the most severe mental health risks are, in fact, exclusive to unique singlehood circumstances. In line with evolutionary theory of psychological distress being an alarm bell for adaptive challenges, the struggle with relationship formation evident in, for example, singlehood due to insecurities, was significantly more associated with anxiety and depression than contexts characterised by self-assurance, e.g., singlehood for freedom. The observed risks were largely explained by cognitive distortions experienced within those singlehood circumstances and played a deciding role in the mental health of the most innocuous singlehood cluster – singlehood by choice. Wider circumstances and personal characteristics such as social support, locus of control and sexist attitudes were found to shape the experience of singlehood only modestly,

yet the unparalleled influence of personal cognitions highlighted that it is internal rather than external circumstances that define how people experience life without a partner. While my work was cross-sectional and exploratory and as such this singlehood typology requires longitudinal study and replication in more diverse samples, it lays substantial groundwork and suggests direction for future research. The identification of cognitive distortions as a mechanism behind mental health in singlehood is the first step into a promising avenue for both research and clinical intervention. Alongside a more theory-informed classification of singlehood, my work might contribute to the development of targeted support and help challenge the still present stigma.

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Appendix A

Table 1

Participants' ethnicity, sexual orientation, education, socioeconomic background in Study 1

Characteristic	<i>n</i>	%
Ethnicity		
Caucasian/White	305	78.61
South Asian – Indian, Pakistani, etc.	39	10.05
Black	15	3.87
Other	15	3.87
Southeast Asian – Thai, Cambodian, etc.	6	1.55
East Asian – Chinese, Japanese, etc.	5	1.29
Middle Eastern, North African	3	0.77
Missing	1	.26
Sexual Orientation		
Heterosexual	303	78.09
Bisexual	62	15.98
Homosexual	13	3.35
Asexual	5	1.29
Other	5	1.29
Missing	1	.26

Characteristic	<i>n</i>	%
Education		
Some College/University Completed	217	55.78
Bachelors/Undergraduate Degree	76	19.54
Graduate High School Completed	50	12.85
Masters/Postgraduate Degree	37	9.51
Some High School	9	2.31
Socioeconomic Background		
Middle	197	50.64
Lower Middle	101	25.96
Upper Middle	63	16.2
Lower	25	6.43
Upper	3	.77

Table 2

Participants' ethnicity, sexual orientation, education, socioeconomic background in Study 2

Characteristic	<i>n</i>	%
Ethnicity		
Caucasian/White	213	73.45
Black	23	7.93
Other	16	5.52

Characteristic	<i>n</i>	%
South Asian – Indian, Pakistani, etc.	13	4.48
Middle Eastern/African	6	2.07
Southeast Asian – Thai, Cambodian, etc.	6	2.07
East Asian – Chinese, Japanese	6	2.07
Native American	5	1.72
New Zealand Maori/Pacific Islander	2	.69
Sexual Orientation		
Heterosexual	178	61.38
Bisexual	59	20.35
Asexual	24	8.28
Homosexual	22	7.59
Other	7	2.41
Education		
Completed		
Bachelors/Undergraduate Degree	113	38.97
Completed Masters/Postgraduate Degree	72	24.83
Some College/University	66	22.76
Graduate High School	31	10.69

Characteristic	<i>n</i>	%
Some High School or Less	8	2.76
Socioeconomic Background		
Middle	127	43.79
Lower-middle	68	23.45
Upper-middle	61	21.03
Lower	22	7.59
Upper	12	4.14

Appendix B

Patient Health Questionnaire and General Anxiety Disorder (PHQ-9 and GAD-7)

Date _____ Patient Name: _____ Date of Birth: _____

**Over the last 2 weeks, how often have you been bothered by any of the following problems?
Please circle your answers.**

PHQ-9	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things.	0	1	2	3
2. Feeling down, depressed, or hopeless.	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much.	0	1	2	3
4. Feeling tired or having little energy.	0	1	2	3
5. Poor appetite or overeating.	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television.	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way.	0	1	2	3
Add the score for each column				

Total Score (add your column scores): _____

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people? (Circle one)

Not difficult at all
Somewhat difficult
Very Difficult
Extremely Difficult

**Over the last 2 weeks, how often have you been bothered by any of the following problems?
Please circle your answers.**

GAD-7	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge.	0	1	2	3
2. Not being able to stop or control worrying.	0	1	2	3
3. Worrying too much about different things.	0	1	2	3
4. Trouble relaxing.	0	1	2	3
5. Being so restless that it's hard to sit still.	0	1	2	3
6. Becoming easily annoyed or irritable.	0	1	2	3
7. Feeling afraid as if something awful might happen.	0	1	2	3
Add the score for each column				

Total Score (add your column scores): _____

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people? (Circle one)

Not difficult at all
Somewhat difficult
Very Difficult
Extremely Difficult

UHS Rev 4/2020

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc.
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Appendix C

Cognitive Distortions Questionnaire - 9-Item Short-Form (CD-Quest-S9)

Please, make a circle around the number corresponding to each option below, indicating cognitive errors or distortions that you have made during this past week. When assessing each cognitive distortion, please, indicate how much you believed it in the exact moment it occurred (not how much you believe it now), and how often it occurred during this past week. Please, give your own examples for any items you rate as occurring much of the time or almost all of the time. **DURING THIS PAST WEEK, I FOUND MYSELF THINKING THIS WAY:**

1. **Discounting the positive:** I disqualify positive experiences or events insisting that they do not count.

EXAMPLES: "I passed the exam, but I was just lucky." "Going to college is not a big deal, anyone can do it."

My example:

Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
Intensity:				
I believed it...	0			
A little (Up to 30%)		2	4	6
Much (31% to 70%)		4	6	6
Very much (More than 70%)		6	6	6

2. **Emotional reasoning:** I believe my emotions reflect reality and let them guide my attitudes and judgments.

EXAMPLES: "I feel she loves me, so it must be true." "I am terrified of airplanes, so flying must be dangerous." "My feelings tell me I should not believe him."

My example:

Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
Intensity:				
I believed it...	0			
A little (Up to 30%)		2	4	4
Much (31% to 70%)		4	4	5
Very much (More than 70%)		4	5	9

3. **Labeling:** I put a fixed, global label, usually negative, on myself or others.

EXAMPLES: "I'm a loser." "He's a rotten person." "She's a complete jerk."

My example:

Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
Intensity:				
I believed it...	0			
A little (Up to 30%)		3	4	4
Much (31% to 70%)		4	4	4
Very much (More than 70%)		4	4	7

4. **Selective abstraction (also called mental filter and tunnel vision):** I pay attention to one or a few details and fail to see the whole picture.

EXAMPLES: "Michael pointed out an error in my work. So, I can be fired" (not considering Michael's overall positive feedback). "I can't forget that a small piece of information I gave during my presentation was wrong" (not considering its success and the audience's great applause).

My example:

Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
Intensity:				
I believed it...	0			
A little (Up to 30%)		1	3	6
Much (31% to 70%)		3	6	6
Very much (More than 70%)		6	6	9

5. **Mind reading:** I believe that I know the thoughts or intentions of others (or that they know my thoughts or intentions) without having sufficient evidence.

EXAMPLES: "He's thinking that I failed." "She thought I didn't know the project." "He knows I do not like to be touched this way."

My example:

Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
Intensity:				
I believed it...	0			
A little (Up to 30%)		2	3	3
Much (31% to 70%)		3	3	7
Very much (More than 70%)		3	7	7

6. Overgeneralization: I take isolated negative cases and generalize them, transforming them in a never-ending pattern, by repeatedly using words such as “always”, “never”, “ever”, “whole”, “entire”, etc.

EXAMPLES: “It was raining this morning, which means it will rain during the whole weekend.” “What bad luck! I missed the plane, so this will interfere in my entire vacation.” “My headache will never stop.”

My example:.....

Intensity:	Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
I believed it...		0			
A little (Up to 30%)			3	3	5
Much (31% to 70%)			3	5	7
Very much (More than 70%)			5	7	9

7. Should statements (also “musts”, “oughts”, “have tos”): I tell myself that events, people’s behaviors, and my own attitudes “should” be the way I expected them to be and not as they really are.

EXAMPLES: “I should have been a better mother”. “He should have married Ann instead of Mary”. “I shouldn’t have made so many mistakes.”

My example:

Intensity:	Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
I believed it...		0			
A little (Up to 30%)			0	2	2
Much (31% to 70%)			2	2	5
Very much (More than 70%)			2	5	8

8. What if?: I keep asking myself questions such as “what if something happens?”

EXAMPLES: “What if my car crashes?” “What if I have a heart attack?” “What if my husband leaves me?”

My example:.....

Intensity:	Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
I believed it...		0			
A little (Up to 30%)			0	2	4
Much (31% to 70%)			2	4	6
Very much (More than 70%)			4	6	6

9. Unfair comparisons: I compare myself with others who seem to do better than I do and place myself in a disadvantageous position.

EXAMPLES: “My father always preferred my elder brother because he is much smarter than I am.” “I can’t stand she is more successful than I am.”

My example:

Intensity:	Frequency:	No (It did not occur)	Occasional (1-2 days during the past week)	Much of the time (3-5 days during the past week)	Almost all of the time (6-7 days during the past week)
I believed it...		0			
A little (Up to 30%)			0	4	4
Much (31% to 70%)			4	4	7
Very much (More than 70%)			4	7	7

Scoring Instructions: To estimate the total composite score on the full 15-item CD-Quest, sum the scores from the selected table cells and add 1.

Appendix D

Sexual Harassment and Coercion Index

Adapted from: Kennair, L. E. O., & Bendixen, M. (2012). Sociosexuality as predictor of sexual harassment and coercion in female and male high school students. *Evolution and*

The following questions are very sensitive in nature. If you do not wish to answer them, then you do not have to. However, if you do choose to answer then we would appreciate it if you could do so honestly. As a reminder, all questions and responses collected during this study are 100% anonymous.

In the past year, have you been subjected to any of the following from either the same and/or opposite sex? [Yes/No for each item].

1. Denigrating comments such as "whore", "manwhore", "slut", "manslut", "loose", etc.
2. Denigrating comments such as "gay", "lesbo", "fag", "dyke", etc.
3. Denigrating comments such "cunt", "prick", "asshole", "bitch", etc.
4. Dirty/debasing talk or denigrating comments on body or looks
5. Showed sexually laden pictures or objects
6. Spreading of sexual rumors
7. Having had pictures of you distributed online when undressed*
8. Received sexual content through electronic media (mobile or internet)
9. Sexual requests (asking for or requiring sexual service)

Human Behavior, 33(5), 479-490.

In the past year, have you done any of the following to either the same and/or opposite sex? [Yes/No for each item].

1. Made denigrating comments such as "whore", "manwhore", "slut", "manslut", "loose", etc.
 2. Made denigrating comments such as "gay", "lesbo", "fag", "dyke", etc.
 3. Made denigrating comments such "cunt", "prick", "asshole", "bitch", etc.
 4. Dirty/debasing talk or make denigrating comments on body or looks
-

5. Showed sexually laden pictures or objects
6. Spread sexual rumors
7. Spread undressed pictures of someone you personally know online
8. Sent sexual content through electronic media (mobile or internet)
9. Made sexual requests (asking for or requiring sexual service)

Appendix E

Emotional Abuse Questionnaire

Adapted from: Neil Jacobson, Ph.D. and John Gottman, Ph.D. –both experts in the field of Domestic Violence.

Circle which answer best applies. Score 1 point for every “never”, 2 points for every “rarely”, 4 points for every “occasionally”, and 5 points for every “very often.” Total these points for your score. If your score is between 73-94= you are being emotionally abused. If your score is higher than 95= you are being more severely abused than the average battered woman.

My Partner:

1. Tried to convince other people that I am crazy.

Never Rarely Occasionally Very Often

2. Told other people that there is something wrong with me.

Never Rarely Occasionally Very Often

3. Told me no one else would ever want me.

Never Rarely Occasionally Very Often

4. Questioned whether my love is true.

Never Rarely Occasionally Very Often

5. Compared me unfavorably to other partners.

Never Rarely Occasionally Very Often

6. Questioned my sanity.

Never Rarely Occasionally Very Often

Appendix F

The revised Sociosexual Orientation Inventory (SOI-R) Short Manual

Items 1-3 should be coded as 0 = 1, 1 = 2, 2 = 3, 3 = 4, 4 = 5, 5-6 = 6, 7-9 = 7, 10-19 = 8, 20 or more = 9; they can then be aggregated (i.e., summed or averaged) to form the Behavior facet ($\alpha = .85$). After reverse-coding item 6, items 4-6 can be aggregated to form the Attitude facet ($\alpha = .87$). Aggregating items 7-9 results in the Desire facet ($\alpha = .86$). Finally, all nine items can be aggregated to a total score of global sociosexual orientation ($\alpha = .83$).

When items 1-3 are presented with open response format instead of the rating scales, items 2, 4, and 7 of the original SOI can be added to the SOI-R to allow for calculating the SOI total score in addition to the SOI-R scores. In this case, the open responses should be recoded to the rating scale format (i.e., 0 = 1, 1 = 2, ..., 20 to max. = 9) before the SOI-R scores are determined.

Alternatively, we also developed a version of the SOI-R with 5-point rating scales, which might be more appropriate for samples with less educated or less test-experienced subjects. In this version, the scale alternatives are "0", "1", "2-3", "4-7", and "8 or more" (coded as 1 to 5) for the Behavior items, 1 (strongly disagree) to 5 (strongly agree) for the Attitude items, and "never", "very seldom", "about once a month", "about once a week", and "nearly every day" (coded as 1 to 5) for the Desire item. In a large, heterogeneous online sample ($N = 8,549$), the SOI-R with five response alternatives per item achieved good internal consistencies ($\alpha = .83, .81, .82, \text{ and } .85$ for the total score and the facets Behavior, Attitude, and Desire, respectively).

The SOI-R can be cited as:

Penke, L., & Asendorpf, J. B. (2008). Beyond global sociosexual orientations: A more differentiated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of Personality and Social Psychology, 95*, 1113-1135.

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7. How often do you have fantasies about having sex with someone you are *not* in a committed romantic relationship with?
- 1 – never
 - 2 – very seldom
 - 3 – about once every two or three months
 - 4 – about once a month
 - 5 – about once every two weeks
 - 6 – about once a week
 - 7 – several times per week
 - 8 – nearly every day
 - 9 – at least once a day
8. How often do you experience sexual arousal when you are in contact with someone you are *not* in a committed romantic relationship with?
- 1 – never
 - 2 – very seldom
 - 3 – about once every two or three months
 - 4 – about once a month
 - 5 – about once every two weeks
 - 6 – about once a week
 - 7 – several times per week
 - 8 – nearly every day
 - 9 – at least once a day
9. In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?
- 1 – never
 - 2 – very seldom
 - 3 – about once every two or three months
 - 4 – about once a month
 - 5 – about once every two weeks
 - 6 – about once a week
 - 7 – several times per week
 - 8 – nearly every day
 - 9 – at least once a day

Appendix G

Experiences in Close Relationship Scale-Short Form (ECR-S)

Instruction: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

1. It helps to turn to my romantic partner in times of need.

2. I need a lot of reassurance that I am loved by my partner.

3. I want to get close to my partner, but I keep pulling back.

4. I find that my partner(s) don't want to get as close as I would like.

5. I turn to my partner for many things, including comfort and reassurance.

6. My desire to be very close sometimes scares people away.

7. I try to avoid getting too close to my partner.

8. I do not often worry about being abandoned.

9. I usually discuss my problems and concerns with my partner.

10. I get frustrated if romantic partners are not available when I need them.

11. I am nervous when partners get too close to me.

12. I worry that romantic partners won't care about me as much as I care about them.

Scoring Information:

Anxiety = 2, 4, 6, 8 (reverse), 10, 12

Avoidance = 1 (reverse), 3, 5 (reverse), 7, 9 (reverse), 11

Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The experiences in Close Relationship Scale (ECR)-Short Form: Reliability, validity, and factor structure. *Journal of Personality Assessment*, 88, 187-204.

Appendix H

The Dirty Dozen: A Concise Measure of the Dark Triad

Adapted from: Jonason, P. K., & Webster, G. D. (2010). The Dirty Dozen: A Concise Measure of the Dark Triad. *Psychological Assessment*, 22(2), 420–432.

<https://doi.org/10.1037/a0019265>

Please indicate how much do the following statements characterise you.

Strongly	Disagree (2)	Slightly	Neither	Slightly	Agree	Strongly
disagree (1)		disagree (3)	agree nor	agree (5)	(6)	agree (7)
			disagree (4)			

1. I tend to manipulate others to get my way.
2. I have used deceit or lied to get my way.
3. I have use flattery to get my way.
4. I tend to exploit others towards my own end
5. I tend to lack remorse.
6. I tend to not be too concerned with morality or the morality of my actions.
7. I tend to be callous or insensitive.
8. I tend to be cynical.
9. I tend to want others to admire me.
10. I tend to want others to pay attention to me
11. I tend to seek prestige or status.
12. I tend to expect special favors from others.

Appendix I

Bendixen, M., & Kennair, L. E. O. (2017). When less is more: Psychometric properties of Norwegian short-forms of the Ambivalent Sexism Scales (ASI and AMI) and the Illinois Rape Myth Acceptance (IRMA) Scale. *Scandinavian Journal of Psychology*, 58(6), 541–550. <https://doi.org/10.1111/sjop.1239>

Please indicate how much do you agree or disagree with the following statements.

Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
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Ambivalent Sexism Inventory

- Many women are actually seeking special favors, such as hiring policies that favor them over men, under the guise of asking for "equality"
- Most women interpret innocent remarks or acts as being sexist
- Women seek to gain power by getting control over men
- When women lose to men in a fair competition, they typically complain about being discriminated against
- No matter how accomplished he is, a man is not truly complete as a person unless he has the love of a woman
- Women should be cherished and protected by men
- Every man ought to have a woman whom he adores
- Men should be willing to sacrifice their own well being in order to provide financially for the women in their lives

Ambivalence Toward Men Inventory

- When men act to "help" women, they are often trying to prove they are better than women
- Most men pay lip service to equality for women but can't handle having a woman as an equal
- When it comes down to it, most men are really like children
- Most men sexually harass women, even if only in subtle ways, once they are in a position of power over them
- Even if both members of a couple work, the woman ought to be more attentive to taking care of her man at home
- Every woman needs a male partner who will cherish her
- A woman will never be truly fulfilled in life if she doesn't have a committed, long-term relationship with a man
- Every woman ought to have a man she adores

Appendix J

Rotter's Locus of Control Scale

For each question select the statement that you agree with the most

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
b. By taking an active part in political and social affairs the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as 'luck.'
19. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over the things politicians do in office.
23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.
26. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people, if they like you, they like you.
27. a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
28. a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
29. a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.
-

Score one point for each of the following:

2. a, 3.b, 4.b, 5.b, 6.a, 7.a, 9.a, 10.b, 11.b, 12.b, 13.b, 15.b, 16.a, 17.a, 18.a, 20.a,

21. a, 22.b, 23.a, 25.a, 26.b, 28.b, 29.a.

A high score = External Locus of Control

A low score = Internal Locus of Control

Appendix K

The Social Provisions Scale

Instructions

In answering the next set of questions I am going to ask you, I want you to think about your current relationship with friends, family members, coworkers, community members, and so on. Please tell me to what extent you agree that each statement describes your current relationships with other people. Use the following scale to give me your opinion. (Hand a response card.) So, for example, if you feel a statement is very true of your current relationships, you would tell me "strongly agree". If you feel a statement clearly does not describe your relationships, you would respond "strongly disagree". Do you have any questions?

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. There are people I can depend on to help me if I really need it. _____
2. I feel that I do not have close personal relationships with other people. _____
3. There is no one I can turn to for guidance in times of stress. _____
4. There are people who depend on me for help. _____
5. There are people who enjoy the same social activities I do. _____
6. Other people do not view me as competent. _____
7. I feel personally responsible for the well-being of another person. _____
8. I feel part of a group of people who share my attitudes and beliefs. _____
9. I do not think other people respect my skills and abilities. _____
10. If something went wrong, no one would come to my assistance. _____
11. I have close relationships that provide me with a sense of emotional security
and well-being. _____
12. There is someone I could talk to about important decisions in my life. _____
13. I have relationships where my competence and skills are recognized. _____
14. There is no one who shares my interests and concerns. _____
15. There is no one who really relies on me for their well-being. _____
16. There is a trustworthy person I could turn to for advice if I were having
problems. _____

17. I feel a strong emotional bond with at least one other person. _____
18. There is no one I can depend on for aid if I really need it. _____
19. There is no one I feel comfortable talking about problems with. _____
20. There are people who admire my talents and abilities. _____
21. I lack a feeling of intimacy with another person. _____
22. There is no one who likes to do the things I do. _____
23. There are people I can count on in an emergency. _____
24. No one needs me to care for them. _____

Appendix K

PARTICIPANT INFORMATION SHEET

Personality and thinking styles among different types of relationships and singlehood

(Version 1 – 03/11/2023)

You are being invited to take part in some research. Before you decide whether or not to participate, it is important for you to understand why the research is being conducted and what it will involve. Please read the following information carefully.

What is the purpose of the research?

We are conducting research on unhelpful thinking patterns and errors (also known as cognitive distortions) experienced by people in different relationship categories. The purpose of the study is to investigate whether there is a difference in cognitive distortions' levels or higher prevalence of specific cognitive distortions across different relationship and singlehood types. Historically, relationship status was assessed in broad categories, i.e., in a relationship vs. single. However, we take into consideration that people can identify with either of the categories for a variety of reasons (e.g., single voluntarily/ single because can't attract a partner/single because scared of getting hurt, etc.) and therefore aim to investigate whether any of such are more closely linked with cognitive distortions than the others.

Moreover, unhelpful thinking patterns have been previously associated with certain personal characteristics and experiences. Therefore, we intend to explore their role in relationship outcomes as well. Your participation in this study will take approximately 25 minutes.

Who is carrying out the research?

The data are being collected by Malgozata Ragosko, supervised by Dr Andrew G. Thomas, both from the School of Psychology, Swansea University.

What happens if I agree to take part?

You will be asked to fill out a demographic information form and then complete a series of different personality measures. Questionnaires will ask you to assess your mental health, how often do you experience certain patterns of thinking, whether you have experienced and engaged in sexual harassment, or emotional abuse. You will then be instructed to evaluate your pickiness of a prospective partner.

Are there any risks associated with taking part?

The research has been approved by the School of Psychology's Research Ethics Committee. There are no significant risks associated with participation.

Data Protection and Confidentiality

Your data will be processed in accordance with the Data Protection Act 2018 and the General Data Protection Regulation 2016 (GDPR). All information collected about you will be kept

strictly confidential. Your data will only be viewed by the research team. All electronic data will be stored on a password-protected devices of the research team and on the university network. Your consent information will be kept separately from your responses to minimise risk in the event of a data breach.

Please note that the data we will collect for our study will be made anonymous automatically after the completion of the study. Thus, it will not be possible to identify and remove your data after you have submitted it, should you decide to withdraw from the study. Therefore, if while completing the research you decide to have your data withdrawn, please simply close the browser.

What will happen to the information I provide?

An analysis of the information will form part of our report at the end of the study and may be presented to interested parties and published in scientific journals and related media. Note that all information presented in any reports or publications will be anonymous and unidentifiable.

Is participation voluntary and what if I wish to later withdraw?

Your participation is entirely voluntary – you do not have to participate if you do not want to. If you decide to participate, but later wish to withdraw from the study, then you are free to withdraw at any time, without giving a reason and without penalty.

Data Protection Privacy Notice

The data controller for this project will be Swansea University. The University Data Protection Officer provides oversight of university activities involving the processing of personal data, and can be contacted at the Vice Chancellors Office.

Your personal data will be processed for the purposes outlined in this information sheet.

Standard ethical procedures will involve you providing your consent to participate in this study by completing the consent form that has been provided to you or by ticking the box provided, if consent is collected with an online survey.

The legal basis that we will rely on to process your personal data will be processing is necessary for the performance of a task carried out in the public interest. This public interest justification is approved by the College of Human and Health Sciences Research Ethics Committee, Swansea University.

The legal basis that we will rely on to process special categories of data will be processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes.

How long will your information be held?

Data will be preserved and accessible **for a minimum of 10 years after completion of the research**. Records from studies with major health, clinical, social, environmental or heritage

importance, novel intervention, or studies which are on-going or controversial should be retained for at least 20 years after completion of the study. It may be appropriate to keep such study data permanently within the university, a national collection, or as required by the funder's data policy.

What are your rights?

You have a right to access your personal information, to object to the processing of your personal information, to rectify, to erase, to restrict and to port your personal information. Please visit the University Data Protection webpages for further information in relation to your rights. Any requests or objections should be made in writing to the University Data Protection Officer: University Compliance Officer (FOI/DP), Vice-Chancellor's Office, Swansea University, Singleton Park, Swansea, SA2 8PP; Email: dataprotection@swansea.ac.uk.

How to make a complaint

If you are unhappy with the way in which your personal data has been processed you may in the first instance contact the University Data Protection Officer using the contact details above. If you remain dissatisfied then you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF; www.ico.org.uk.

What if I have other questions?

If you have further questions about this study, please do not hesitate to contact us:

Applicant: Malgozata Ragosko

School of Psychology

Swansea University

Email: 2006237@swansea.ac.uk

Supervisor: Dr Andrew G. Thomas

School of Psychology

Swansea University

Email: a.g.thomas@swansea.ac.uk

Appendix L

Participant Consent Form

Personality and thinking styles among different types of relationships and singlehood

Name & Contact details of the principal researcher: Malgozata Ragosko 2006237@swansea.ac.uk

(supervisor Dr Andrew G. Thomas a.g.thomas@swansea.ac.uk)

	YES/NO
1. I (the participant) confirm that I have read and understand the information sheet for the above study (dated: 03/11/2023 – Version 1) which is attached to this form.	
2. I understand that my participation is voluntary and that I am free to withdraw whilst completing the study by closing the browser window, without giving any reasons. However, should I choose to complete the study, I understand that due to anonymization procedure my data will become impossible to trace back and therefore withdrawn.	
3. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.	
4. I understand that I am free to ask any questions at any time before and during the study by emailing the researcher.	
5. I have been informed that the information I provide will be safeguarded.	
6. I am happy for the information I provide to be used (anonymously) in academic papers and other formal research outputs.	
8. I have been provided with a copy of the Participant Information Sheet.	

9. I agree to the researchers processing my personal data in accordance with the aims of the study described in the Participant Information Sheet.	
10. I declare that I am 18 years or older.	

If you agree with all statements listed above, click **YES**.

If you disagree with any of the statements above, click **NO** and you will be taken to the end of this survey.

This study is being conducted by researchers from the School of Psychology at Swansea University.

Thank you for your participation in this study! Your help is very much appreciated.

Appendix M

DEBRIEF FORM

Personality and thinking styles among different types of relationships and singlehood

Thank you for taking part in our research! Now that your contribution has finished, let me explain the rationale behind this work.

We are interested in the prevalence of unhelpful thinking patterns and errors, also known as cognitive distortions, across different types of relationship categories. We want to assess whether there is a difference in cognitive distortions' levels between people who are in a relationship or remain single and, particularly, between different subcategories of singlehood. We also aim to assess the individual differences, such as mental health, personality, and experience of sexual harassment, and explore their correlation with the range of relationship types.

Previous research has shown that cognitive distortions are a form of malfunctioned adaptive strategies, higher levels of which tend to be associated with certain individual characteristics and experiences. For example, cognitive distortions have an established association with poorer general mental health and mental illnesses such as depression and anxiety. They are also higher in females rather than males and people who have experienced or engaged in sexual harassment. These variables have also been found to significantly contribute to relationship outcomes, i.e., individuals' success in

attracting a prospective partner.

In this research, we are looking at the relationship between thinking errors and unhelpful thinking styles, abovementioned variables associated with them, and different relationship statuses. We take into consideration the variety of personal reasons that lead people to remain single and therefore differentiate singlehood into distinct subcategories, e.g., single by choice/single due to bad past experience/single due to inability to attract a partner. This will allow us to take a closer look at whether unhelpful thinking patterns and previous experiences, such as sexual harassment, are more likely to be associated with any particular categories, for example, involuntary singlehood.

Your information will be used to perform statistical analysis of the data to observe group-level trends, investigate the aims of the research and to write a scientific report.

If you feel affected by issues raised by this research and would like to discuss any concerns, please contact the study Supervisor on the details provided below. If you feel this piece of research may have health implications for you, we advise you to contact your GP (family doctor). Other sources of support may be found at:

Swansea University Student Support Services - <https://www.swansea.ac.uk/student-support-services/>

Mind – Mental health charity - <https://www.mind.org.uk/>

NHS Mental health support - <https://www.nhs.uk/nhs-services/mental-health-services/>

Young minds - <https://www.youngminds.org.uk/>

Relate – <https://relate.org.uk>

More information about the evolutionary perspective on the adaptive function of cognitive perspectives can be found in the study of Gilbert (1998; see below). For an accessible overview of different types of cognitive distortions please refer to NHS's website - <https://www.southwestyorkshire.nhs.uk/wp-content/uploads/2020/09/1765-Cognitive-distortions.pdf>. If you feel affected by the information discussed, you can learn more about how cognitive distortions might be worked with in therapy on this website - <https://www.nhs.uk/mental-health/talking-therapies-medicine-treatments/talking-therapies-and-counselling/cognitive-behavioural-therapy-cbt/how-it-works/>. Should you have any concerns and/or would like to find out about local opportunities to access talking therapy, please contact your GP or physician.

Applicant: Malgozata Ragosko

School of Psychology

Swansea University

Email: 2006237@swansea.ac.uk

Supervisor: Dr Andrew Thomas

School of Psychology

Swansea University

Email: a.g.thomas@swansea.ac.uk

References

Gilbert, P. (1998). The evolved basis and adaptive functions of cognitive distortions. *British Journal of Medical Psychology*, 71(4), 447-463.

Appendix N



Swansea University
Prifysgol Abertawe

Approval Date: 17/11/2023

Research Ethics Approval Number: 1 2023 8164 7173

Thank you for completing a research ethics application for ethical approval and submitting the required documentation via the online platform.

Project Title Personality and thinking styles among different types of relationships and singlehood
 Applicant name MISS MALGOZATA RAGOSKO
 Submitted by MISS MALGOZATA RAGOSKO /
 Full application form link <https://swansea.forms.ethicalreviewmanager.com/Project/Index/10099>

The Psychology ethics committee has approved the ethics application, subject to the conditions outlined below:

Approval conditions

1. The approval is based on the information given within the application and the work will be conducted in line with this. It is the responsibility of the applicant to ensure all relevant external and internal regulations, policies, and legislations are met.
2. This project may be subject to periodic review by the committee. The approval may be suspended or revoked at any time if there has been a breach of conditions.
3. Any substantial amendments to the approved proposal will be submitted to the ethics committee prior to implementing any such changes.

Specific conditions in respect of this application:

The application has been classified as Low Risk to the University.

No additional conditions.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees. It complies with [the guidelines of UKRI](#) and the concordat to support [Research Integrity](#).

Psychology Research and Ethics Chair

Swansea University.

If you have any queries regarding this notification, then please contact your research ethics administrator for the faculty.

- For Science and Engineering contact FSE-Ethics@swansea.ac.uk
- For Medicine, Health and Life Science contact FMHLS-Ethics@swansea.ac.uk
- For Humanities and Social Sciences contact FHSS-Ethics@swansea.ac.uk

Appendix O

PARTICIPANT INFORMATION SHEET

Mental Health and Cognitive Distortions In and Outside the Relationships

(Version 1 – 23/06/2024)

You are being invited to take part in some research. Before you decide whether or not to participate, it is important for you to understand why the research is being conducted and what it will involve. Please read the following information carefully.

What is the purpose of the research?

We are conducting research on mental health and unhelpful thinking patterns and errors (also known as cognitive distortions) experienced by people in relationships and different singlehood categories. This study has 3 purposes. Firstly, we intend to further investigate what are the different singlehood categories and people's reasons for identifying with either. Then, we aim to assess whether those singlehood categories are associated with specific mental health outcomes and experiences. Finally, we will study the impact of factors such as social support, locus of control and sexism, which have previously been found to be associated with mental health. Therefore, we intend to explore the role of these factors in singlehood outcomes as well. Your participation in this study will take approximately 30 minutes.

Who is carrying out the research?

The data are being collected by Malgożata Ragoško, supervised by Dr Andrew G. Thomas, both from the School of Psychology, Swansea University.

What happens if I agree to take part?

You will be asked to fill out a demographic information form and then complete a series of different personality measures. Questionnaires will ask you to assess your mental health, how often do you experience certain patterns of thinking, whether you have experienced and engaged in sexual harassment, or emotional abuse. You will then be instructed to evaluate social support available to you and your perceptions of the same and the opposite sex.

Are there any risks associated with taking part?

The research has been approved by the School of Psychology's Research Ethics Committee. There are no significant risks associated with participation.

Data Protection and Confidentiality

Your data will be processed in accordance with the Data Protection Act 2018 and the General Data Protection Regulation 2016 (GDPR). All information collected about you will be kept strictly confidential. Your data will only be viewed by the research team. All electronic data will be stored on a password-protected devices of the research team and on the university

network. Your consent information will be kept separately from your responses to minimise risk in the event of a data breach.

Please note that the data we will collect for our study will be made anonymous automatically after the completion of the study. Thus, it will not be possible to identify and remove your data after you have submitted it, should you decide to withdraw from the study. Therefore, if while completing the research you decide to have your data withdrawn, please simply close the browser.

What will happen to the information I provide?

An analysis of the information will form part of our report at the end of the study and may be presented to interested parties and published in scientific journals and related media. Note that all information presented in any reports or publications will be anonymous and unidentifiable.

Is participation voluntary and what if I wish to later withdraw?

Your participation is entirely voluntary – you do not have to participate if you do not want to. If you decide to participate, but later wish to withdraw from the study, then you are free to withdraw at any time, without giving a reason and without penalty.

Data Protection Privacy Notice

The data controller for this project will be Swansea University. The University Data Protection Officer provides oversight of university activities involving the processing of personal data, and can be contacted at the Vice Chancellors Office.

Your personal data will be processed for the purposes outlined in this information sheet.

Standard ethical procedures will involve you providing your consent to participate in this study by completing the consent form that has been provided to you or by ticking the box provided, if consent is collected with an online survey.

The legal basis that we will rely on to process your personal data will be processing is necessary for the performance of a task carried out in the public interest. This public interest justification is approved by the College of Human and Health Sciences Research Ethics Committee, Swansea University.

The legal basis that we will rely on to process special categories of data will be processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes.

How long will your information be held?

Data will be preserved and accessible **for a minimum of 10 years after completion of the research**. Records from studies with major health, clinical, social, environmental or heritage importance, novel intervention, or studies which are on-going or controversial should be

retained for at least 20 years after completion of the study. It may be appropriate to keep such study data permanently within the university, a national collection, or as required by the funder's data policy.

What are your rights?

You have a right to access your personal information, to object to the processing of your personal information, to rectify, to erase, to restrict and to port your personal information. Please visit the University Data Protection webpages for further information in relation to your rights. Any requests or objections should be made in writing to the University Data Protection Officer: University Compliance Officer (FOI/DP), Vice-Chancellor's Office, Swansea University, Singleton Park, Swansea, SA2 8PP; Email: dataprotection@swansea.ac.uk.

How to make a complaint

If you are unhappy with the way in which your personal data has been processed you may in the first instance contact the University Data Protection Officer using the contact details above. If you remain dissatisfied then you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF; www.ico.org.uk.

What if I have other questions?

If you have further questions about this study, please do not hesitate to contact us:

Applicant: Malgožata Ragoško

School of Psychology

Swansea University

Email: 2006237@swansea.ac.uk

Supervisor: Dr Andrew G. Thomas

School of Psychology

Swansea University

Email: a.g.thomas@swansea.ac.uk

Appendix P

Participant Consent Form

Mental Health And Cognitive Distortions In and Outside the Relationships

Name & Contact details of the principal researcher: Malgožata Ragoško 2006237@swansea.ac.uk

(supervisor Dr Andrew G. Thomas a.g.thomas@swansea.ac.uk

	YES/NO
1. I (the participant) confirm that I have read and understand the information sheet for the above study (dated: 23/06/2024 – Version 1) which is attached to this form.	
2. I understand that my participation is voluntary and that I am free to withdraw whilst completing the study by closing the browser window, without giving any reasons. However, should I choose to complete the study, I understand that due to anonymization procedure my data will become impossible to trace back and therefore withdrawn.	
3. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.	
4. I understand that I am free to ask any questions at any time before and during the study by emailing the researcher.	
5. I have been informed that the information I provide will be safeguarded.	
6. I am happy for the information I provide to be used (anonymously) in academic papers and other formal research outputs.	
8. I have been provided with a copy of the Participant Information Sheet.	

9. I agree to the researchers processing my personal data in accordance with the aims of the study described in the Participant Information Sheet.	
10. I declare that I am 18 years or older.	

If you agree with all statements listed above, click **YES**.

If you disagree with any of the statements above, click **NO** and you will be taken to the end of this survey.

This study is being conducted by researchers from the School of Psychology at Swansea University.

Thank you for your participation in this study! Your help is very much appreciated.

Appendix Q

DEBRIEF FORM

Mental Health and Cognitive Distortions In and Outside the Relationships

Thank you for taking part in our research! Now that your contribution has finished, let me explain the rationale behind this work.

We are interested in mental health outcomes of people in relationships and across different types of singlehood categories. Specifically, we want to assess the extent of influence of individual cognitive distortions and different cognitive distortion levels. We also aim to assess individual differences such as attachment styles, experience of emotional abuse and/ or sexual harassment, and explore their association with different singlehood types.

Previous research has shown that cognitive distortions are a form of malfunctioned adaptive strategies, higher levels of which tend to be associated with certain individual characteristics and experiences. For example, cognitive distortions have an established association with poorer general mental health and mental illnesses such as depression and anxiety. They are also higher in females rather than males and people who have experienced or engaged in sexual harassment. These variables have also been found to significantly contribute to relationship outcomes, i.e., individuals' success in attracting a prospective partner.

This is the 2nd study of the ongoing research project and therefore builds on the

findings of the study 1. We have previously observed that singlehood can be differentiated into different sub-categories based on people's personal reasons for remaining single. We aim to further establish the distinctions between singlehood categories and the corresponding mental health profiles of each. We are also interested how social support, locus of control and individual's levels of sexism contribute to the experience of being single across different singlehood types. Finally, we aim to study whether the abovementioned factors differ in the extent of influence between men and women.

Therefore, researching singlehood as a diverse, multitype experience will allow us to take a closer look at what factors are associated with mental struggling and which contribute to thriving whilst being single. This will also help us understand whether unhelpful thinking patterns and previous experiences, such as sexual harassment, are more likely to be associated with any particular categories, for example, involuntary singlehood.

Your information will be used to perform statistical analysis of the data to observe group-level trends, investigate the aims of the research and to write a scientific report.

If you feel affected by issues raised by this research and would like to discuss any concerns, please contact the study Supervisor on the details provided below. If you feel this piece of research may have health implications for you, we advise you to contact your GP (family doctor). Other sources of support may be found at:

Swansea University Student Support Services - <https://www.swansea.ac.uk/student->

support-services/

Mind – Mental health charity - <https://www.mind.org.uk/>

NHS Mental health support - <https://www.nhs.uk/nhs-services/mental-health-services/>

Young minds - Mental health charity for children, young people and their parents

<https://www.youngminds.org.uk/>

Relate – Charity offering relationship, children and young people's counselling

<https://relate.org.uk>

Safeline - Specialist sexual violence and abuse charity - <https://safeline.org.uk/>

More information about the evolutionary perspective on the adaptive function of cognitive perspectives can be found in the study of Gilbert (1998; see below). For an accessible overview of different types of cognitive distortions please refer to NHS's website - <https://www.southwestyorkshire.nhs.uk/wp-content/uploads/2020/09/1765-Cognitive-distortions.pdf>. If you feel affected by the information discussed, you can learn more about how cognitive distortions might be worked with in therapy on this website - <https://www.nhs.uk/mental-health/talking-therapies-medicine-treatments/talking-therapies-and-counselling/cognitive-behavioural-therapy-cbt/how-it-works/>. Should you have any concerns and/or would like to find out about local opportunities to access talking therapy, please contact your GP or physician.

Applicant: Malgożata Ragoško

School of Psychology

Swansea University

Email: 2006237@swansea.ac.uk

Supervisor: Dr Andrew Thomas

School of Psychology

Swansea University

Email: a.g.thomas@swansea.ac.uk

|

References

Gilbert, P. (1998). The evolved basis and adaptive functions of cognitive distortions. *British Journal of Medical Psychology*, 71(4), 447-463.

Appendix R



Swansea University
Prifysgol Abertawe

Approval Date: 11/07/2024

Research Ethics Approval Number: 1 2024 10467 9260

Thank you for completing a research ethics application for ethical approval and submitting the required documentation via the online platform.

Project Title Mental Health And Cognitive Distortions In and Outside the Relationships
Applicant name MISS MALGOZATA RAGOSKO
Submitted by MISS MALGOZATA RAGOSKO /
Full application form link <https://swansea.forms.ethicalreviewmanager.com/Project/Index/12569>

The Psychology ethics committee has approved the ethics application, subject to the conditions outlined below:

Approval conditions

1. The approval is based on the information given within the application and the work will be conducted in line with this. It is the responsibility of the applicant to ensure all relevant external and internal regulations, policies, and legislations are met.
2. This project may be subject to periodic review by the committee. The approval may be suspended or revoked at any time if there has been a breach of conditions.
3. Any substantial amendments to the approved proposal will be submitted to the ethics committee prior to implementing any such changes.

Specific conditions in respect of this application:

The application has been classified as Low Risk to the University.

No additional conditions.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees. It complies with [the guidelines of UKRI](#) and the concordat to support [Research Integrity](#).

Psychology Research and Ethics Chair

Swansea University.

If you have any queries regarding this notification, then please contact your research ethics administrator for the faculty.

- For Science and Engineering contact FSE-Ethics@swansea.ac.uk
- For Medicine, Health and Life Science contact FMHLS-Ethics@swansea.ac.uk
- For Humanities and Social Sciences contact FHSS-Ethics@swansea.ac.uk

Appendix S

Table 1

Assumption of Homogeneity of Variances of Single vs. Participants in Committed Relationships on Measures of Depression, Anxiety, Cognitive Distortions, Experience and Perpetration of Sexual Harassment, Emotional Abuse, Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment, Dark Triad Traits

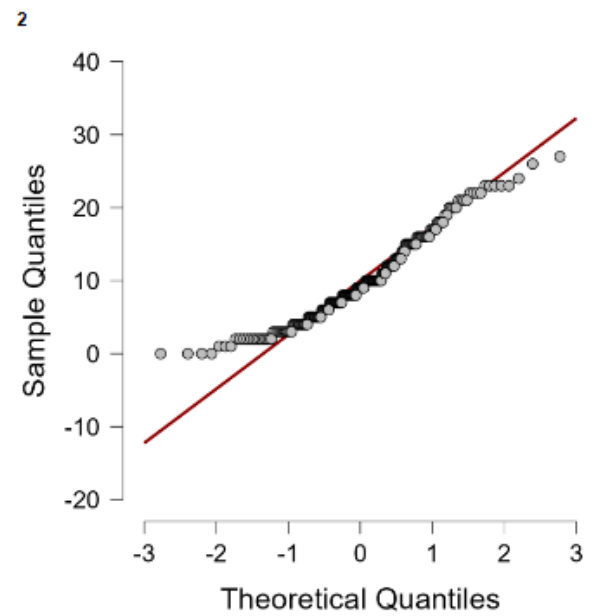
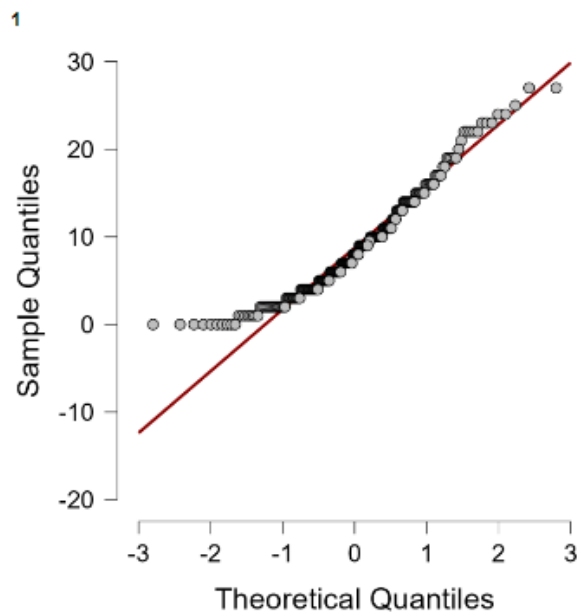
Measure	<i>F</i>	<i>df</i> ₁	<i>df</i> ₂	<i>p</i>
Depression	.02	1	373	.886
Anxiety	1.07	1	373	.302
Cognitive Distortions	<.001	1	373	.302
Experience of Sexual Harassment	.49	1	373	.484
Perpetration of Sexual Harassment	.16	1	373	.691
Emotional Abuse	10.45	1	272	.001
Mating Performance	.05	1	373	.822
Sociosexuality	6.42	1	373	.01
Avoidant Attachment	2.28	1	373	.132
Anxious Attachment	1.51	1	373	.22
Dark Triad Traits	.03	1	373	.302

Figure 1

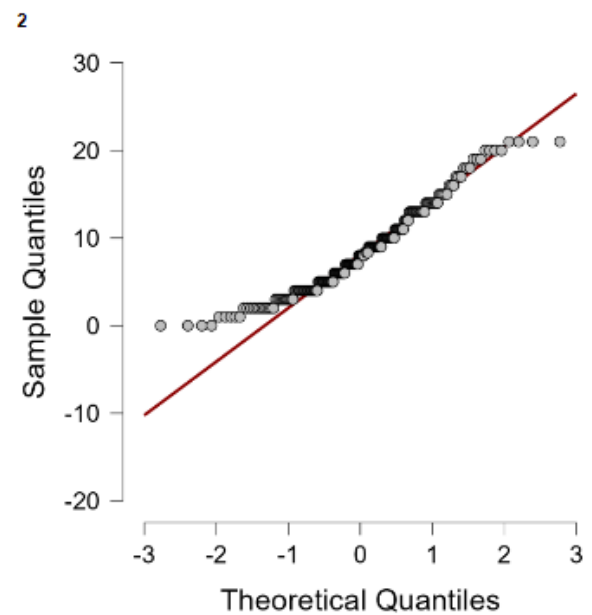
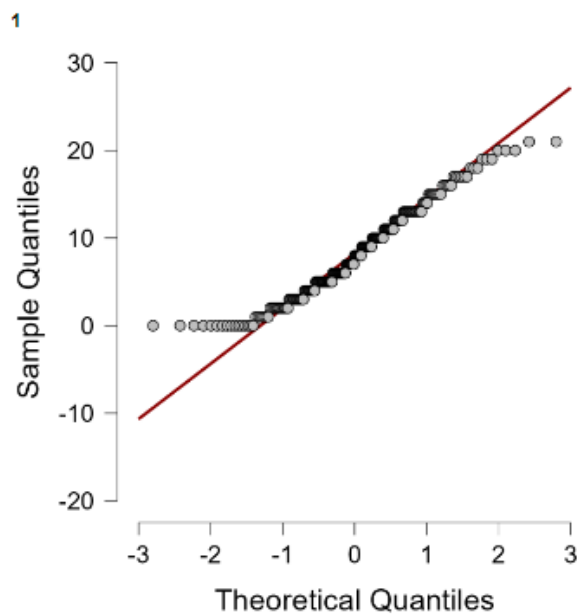
Q-Q plots of Single and Committed Participants on Measures of Depression, Anxiety, Cognitive Distortions, Experience and Perpetration of Sexual Harassment, Emotional Abuse,

Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment, Dark Triad Traits

PHQtotal ▼

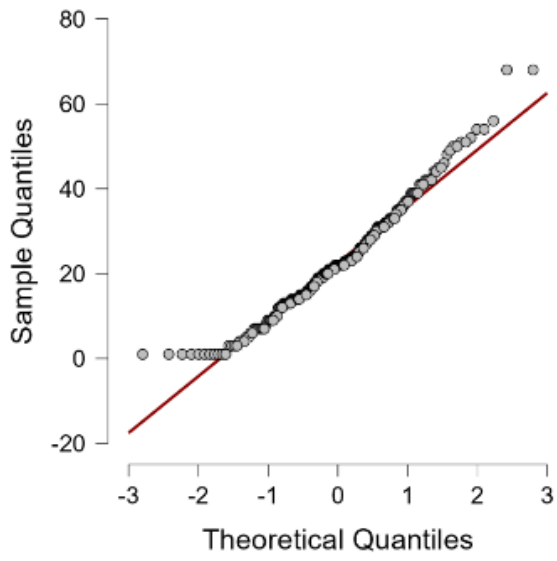


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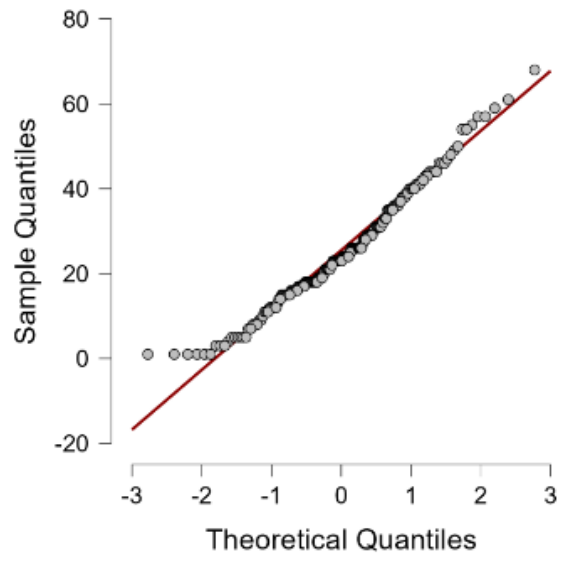


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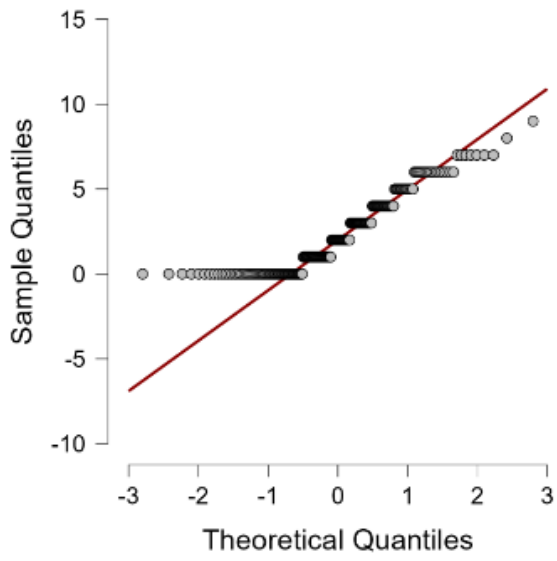


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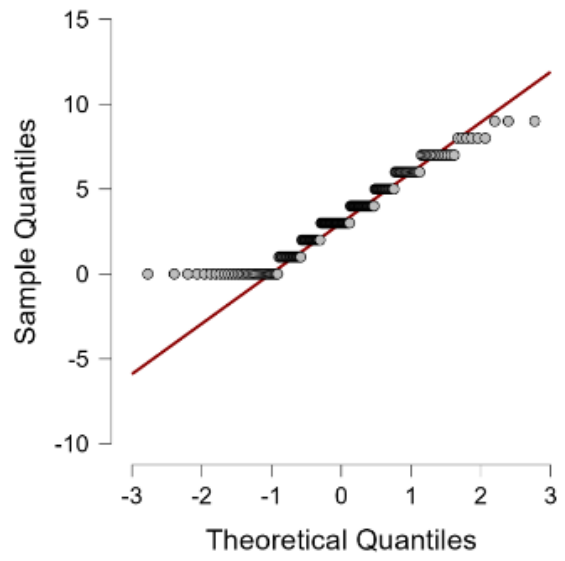


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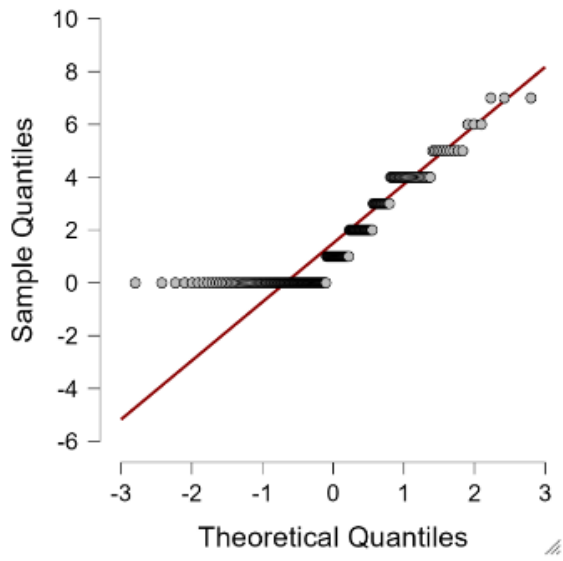


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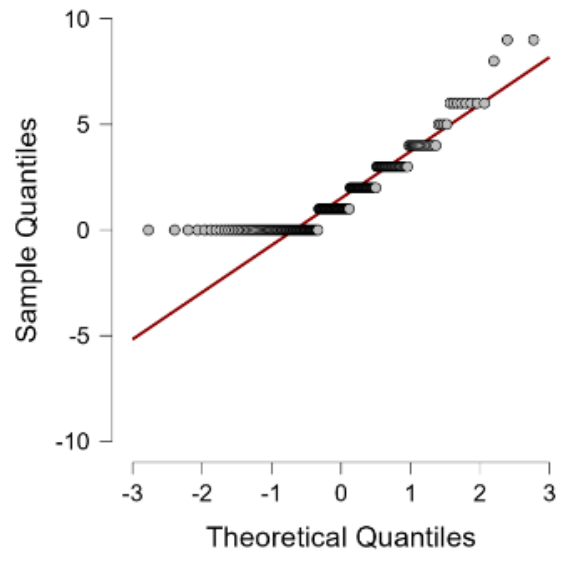


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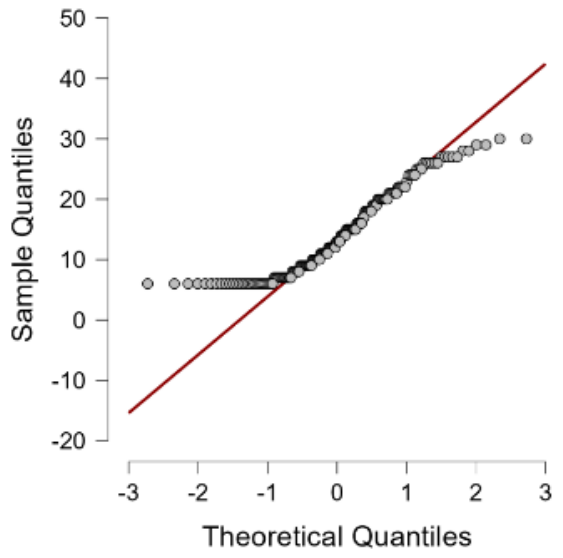


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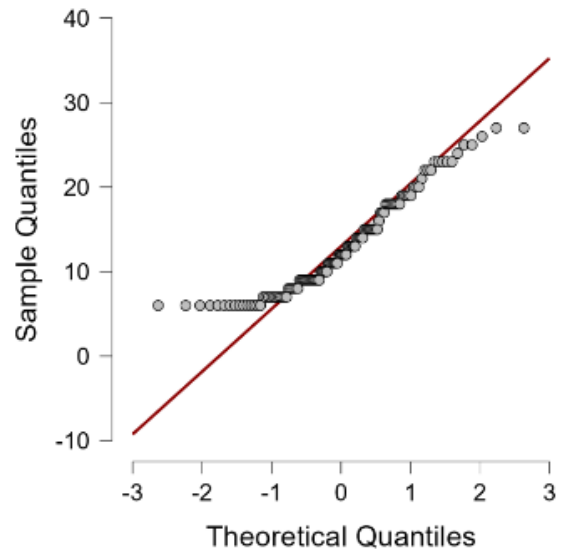


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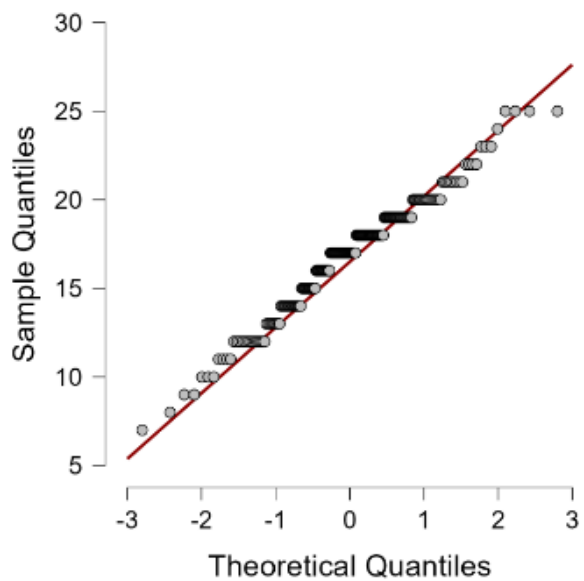


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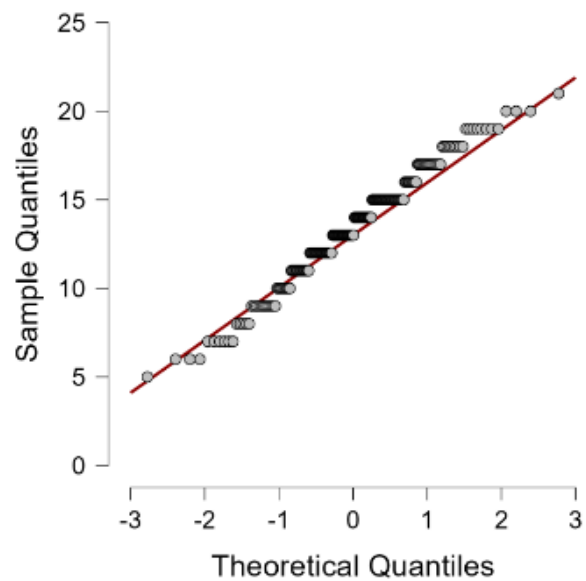


MPStotal

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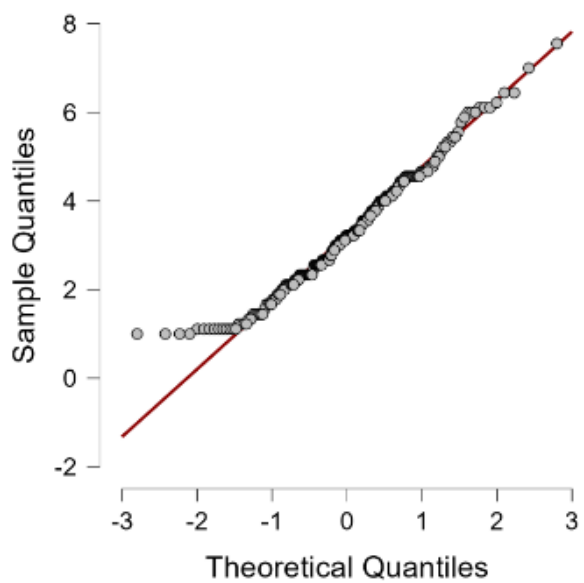


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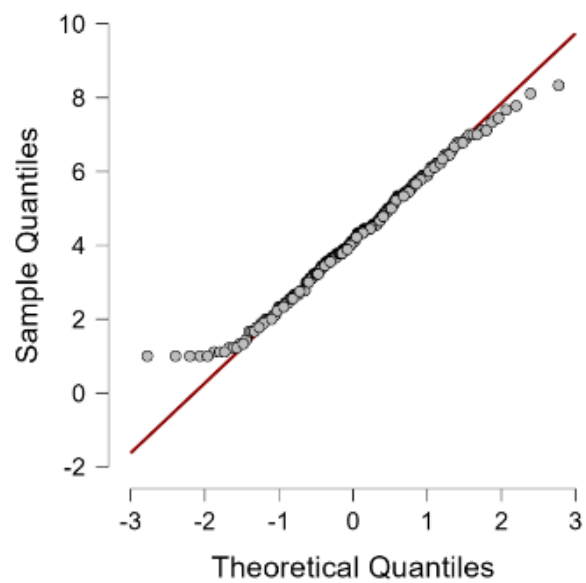


AVER_SOIR

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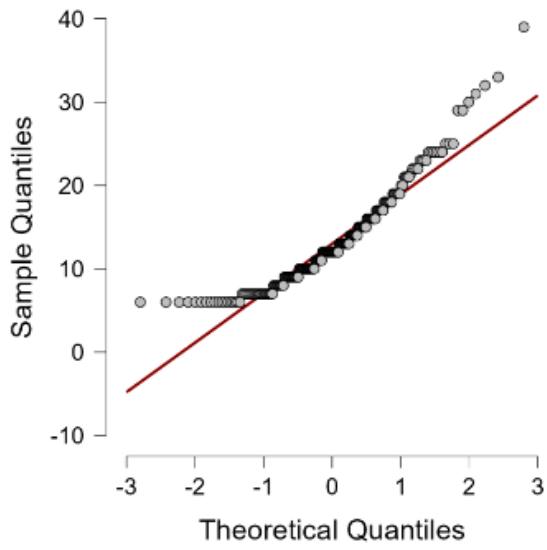


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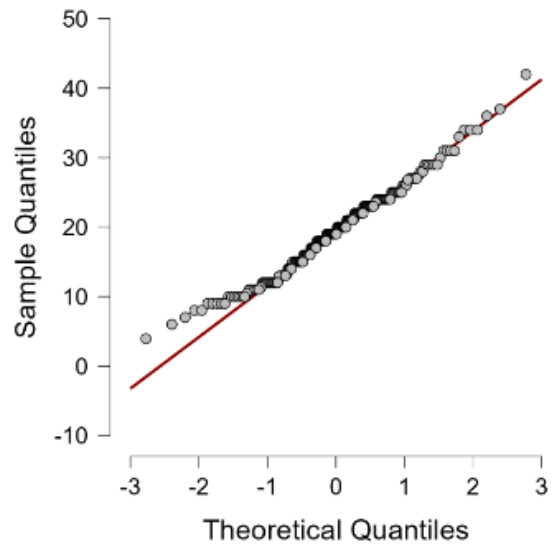


ECRS_anxiety

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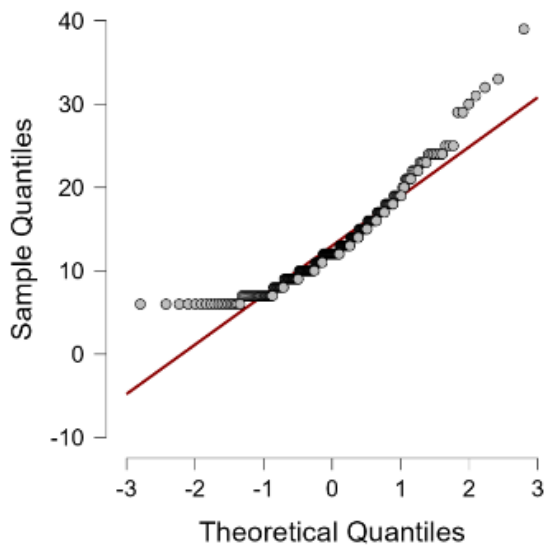


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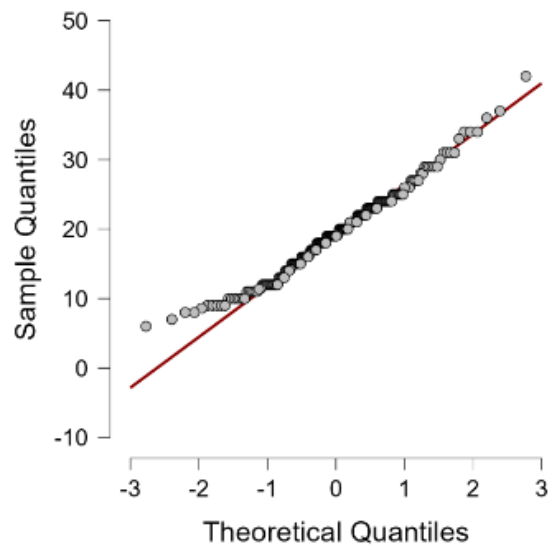


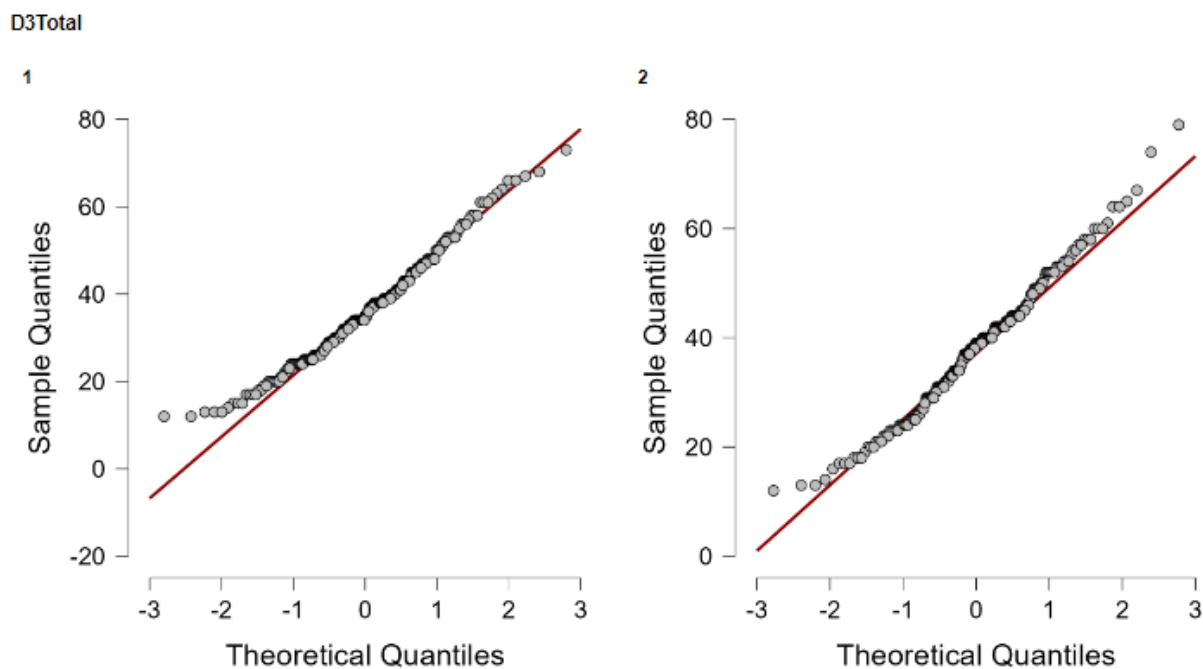
ECRS_avoidance

1



2





Note. 1 In a relationship, 2 Single

Table 2

Assumption of Homogeneity of Variances of Single due to interpersonal problems, Single by choice and Participants in Committed Relationships on Measures of Depression, Anxiety, Cognitive Distortions, Experience and Perpetration of Sexual Harassment, Emotional Abuse, Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment, Dark Triad Traits

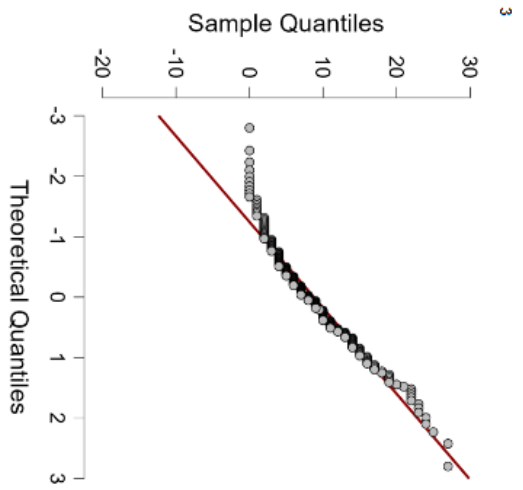
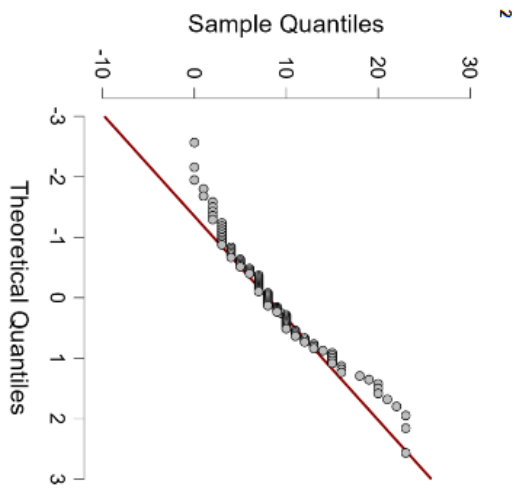
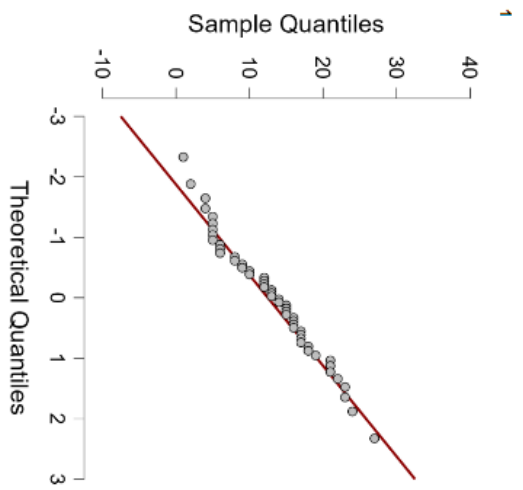
Measure	F	$df1$	$df2$	p
Depression	1.54	2	339	.217
Anxiety	5.25	2	339	.006

Measure	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Cognitive Distortions	.17	2	339	.845
Experience of Sexual Harassment	.26	2	339	.77
Perpetration of Sexual Harassment	.69	2	339	.5
Emotional Abuse	8.21	2	253	<.001
Mating Performance	.09	2	339	.915
Sociosexuality	5.72	2	339	.004
Avoidant Attachment	1.06	2	339	.348
Anxious Attachment	1.65	2	339	.194
Dark Triad Traits	.22	2	339	.806

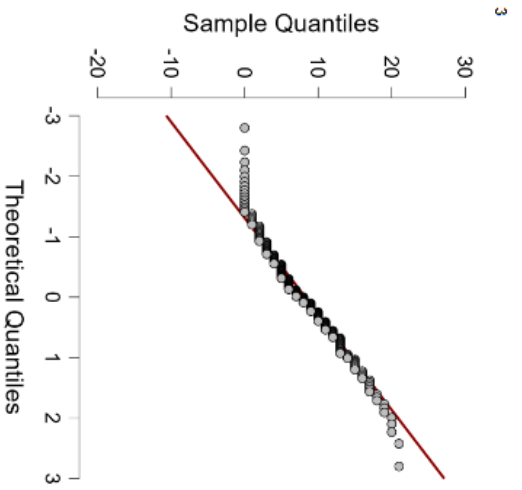
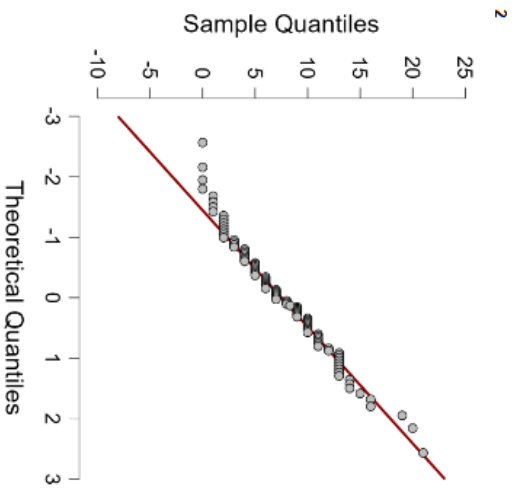
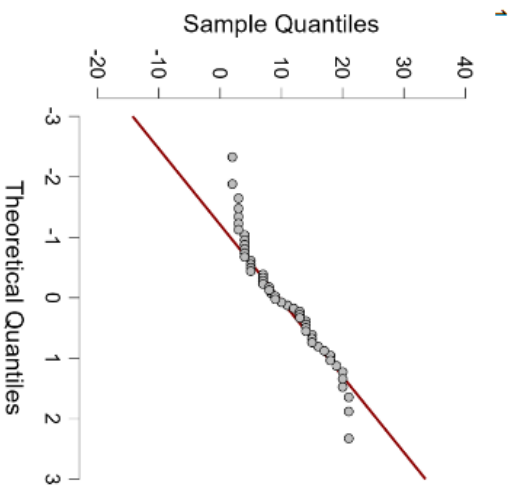
Figure 2

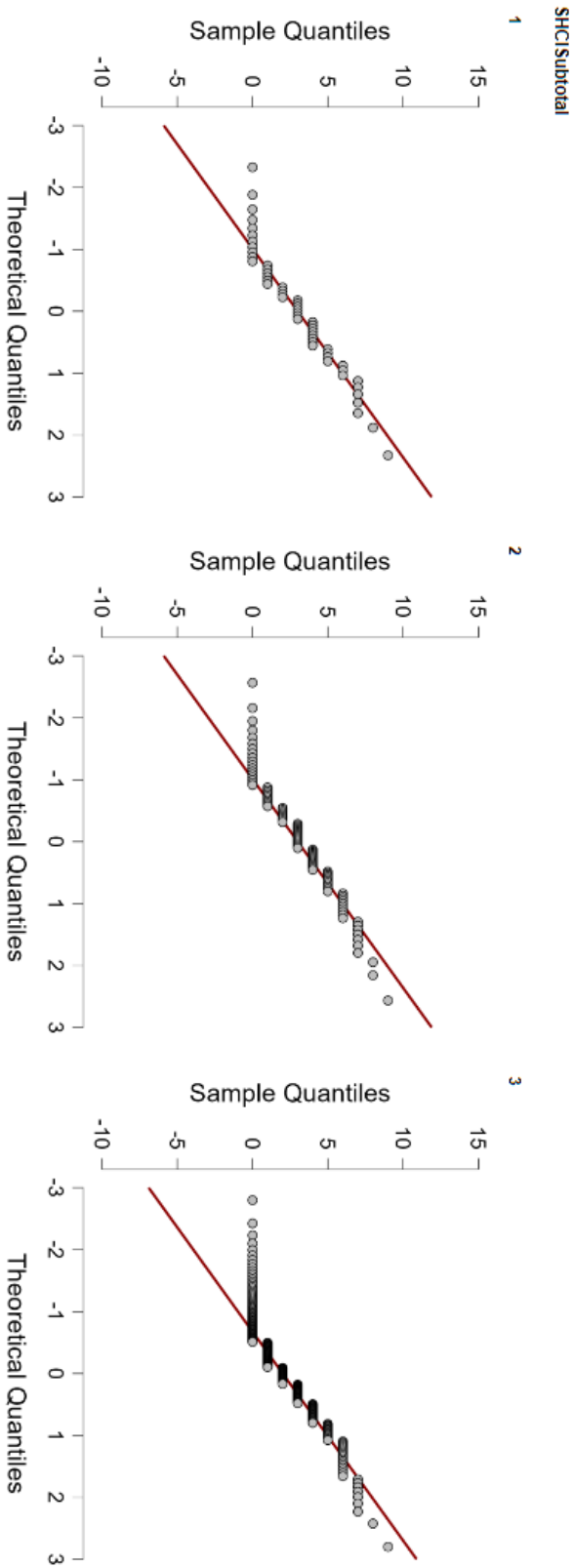
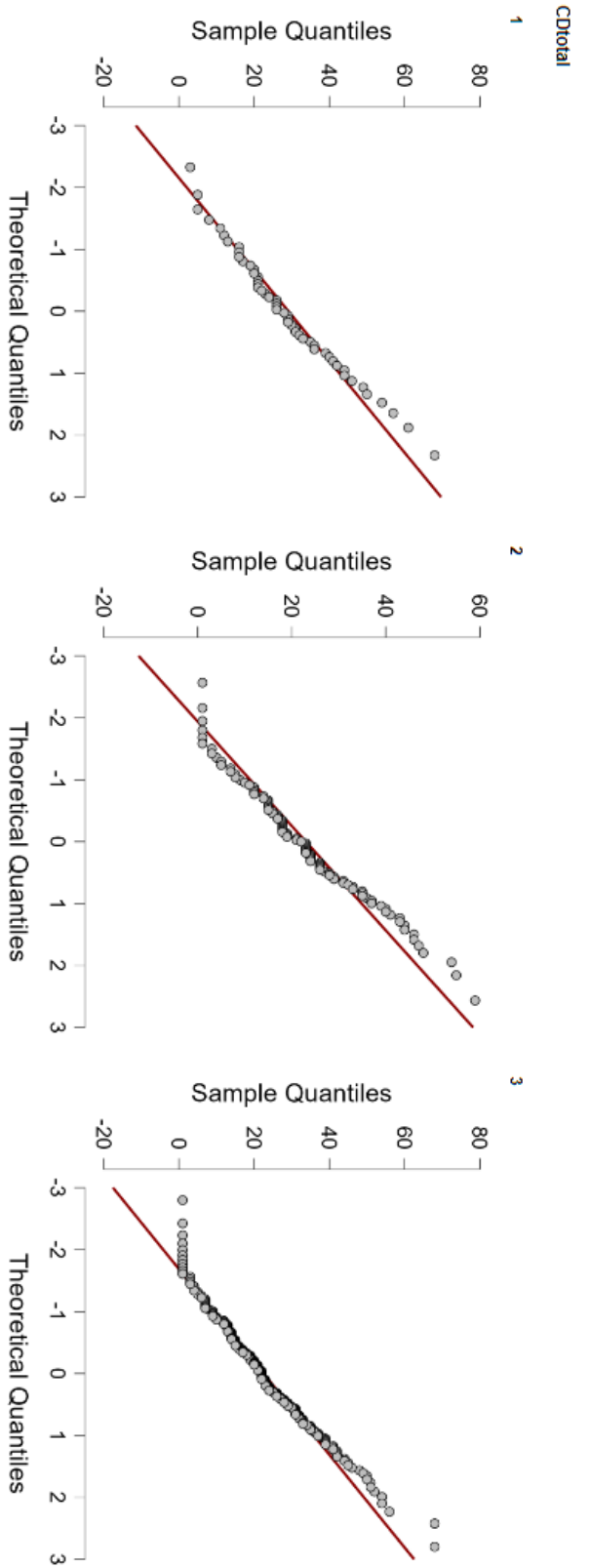
Q-Q plots of Participants Single due to Interpersonal Problems, Single by Choice and Committed Participants on Measures of Depression, Anxiety, Cognitive Distortions, Experience and Perpetration of Sexual Harassment, Emotional Abuse, Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment, Dark Triad Traits

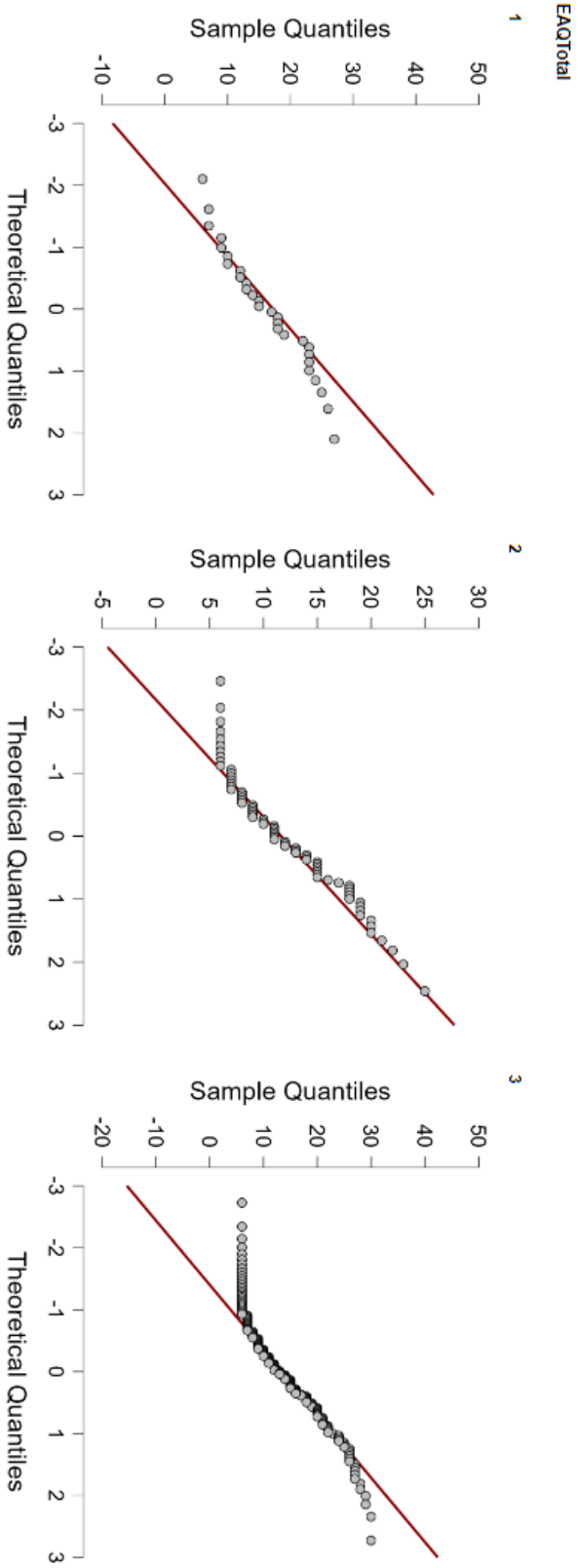
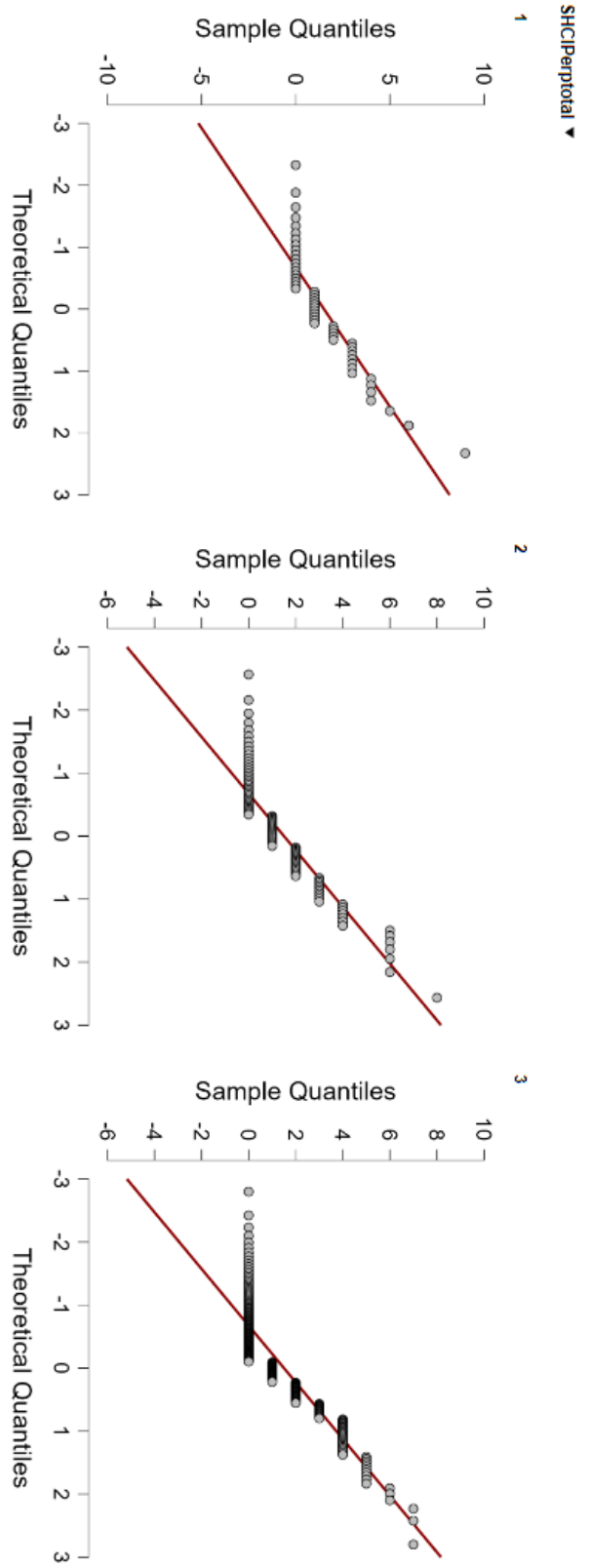
Q-Q Plots
PHQtotal



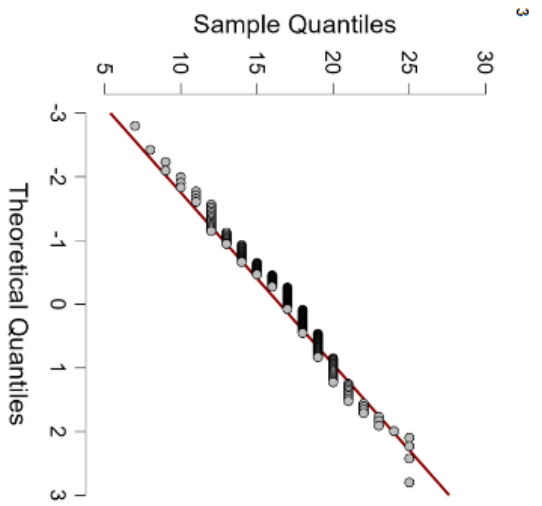
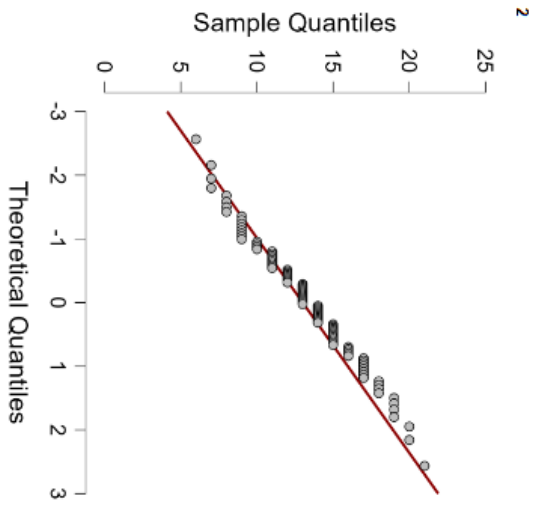
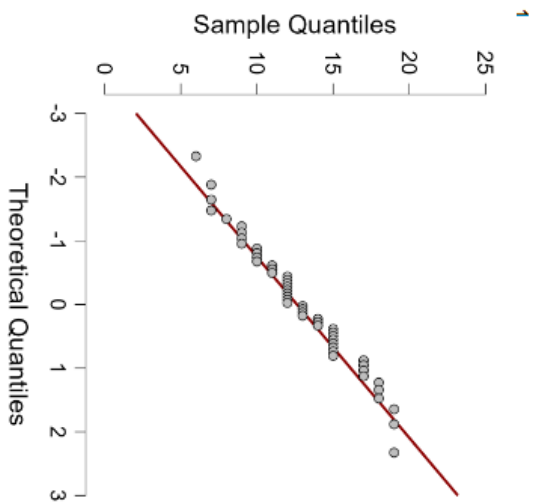
GADtotal



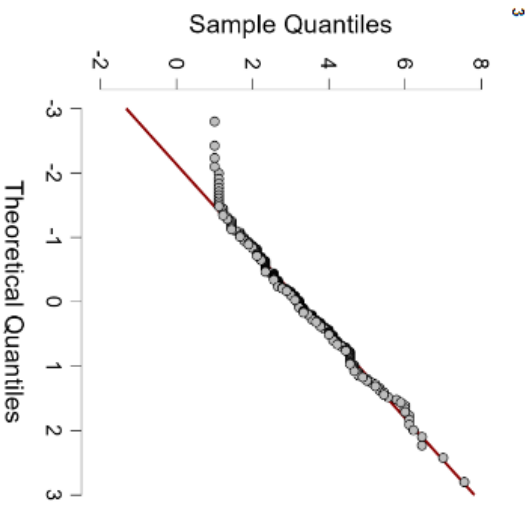
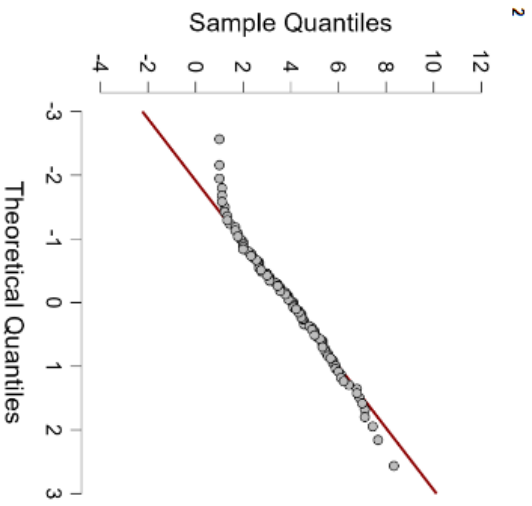
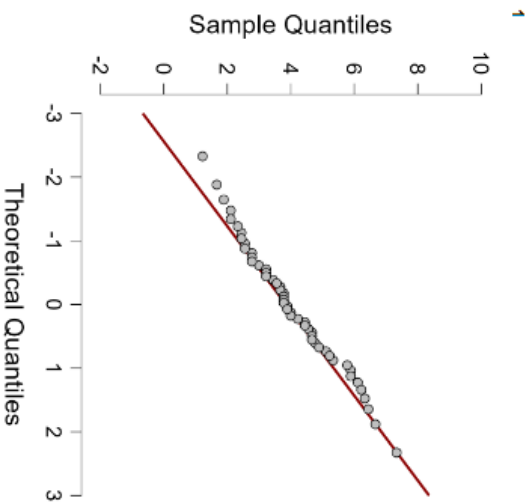




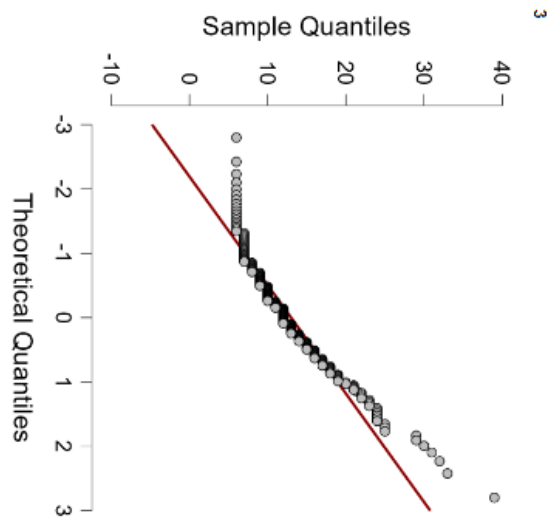
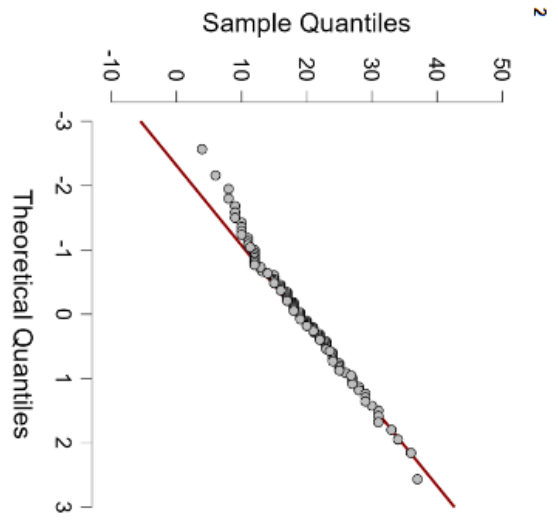
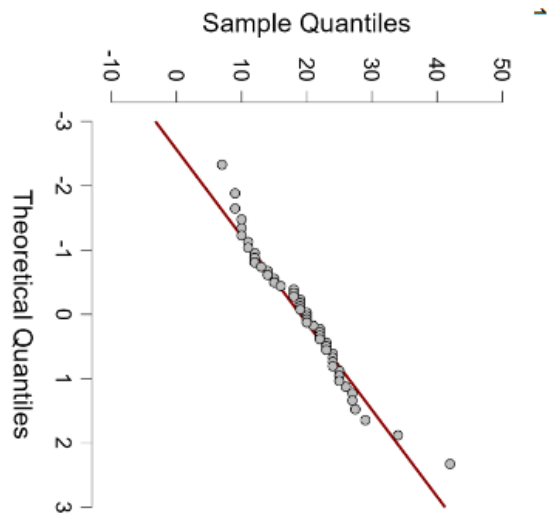
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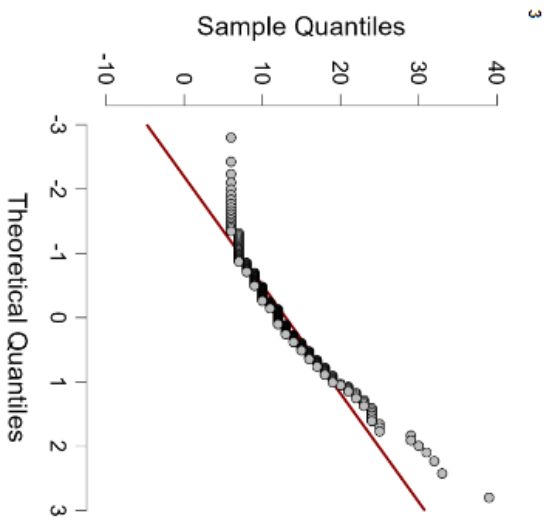
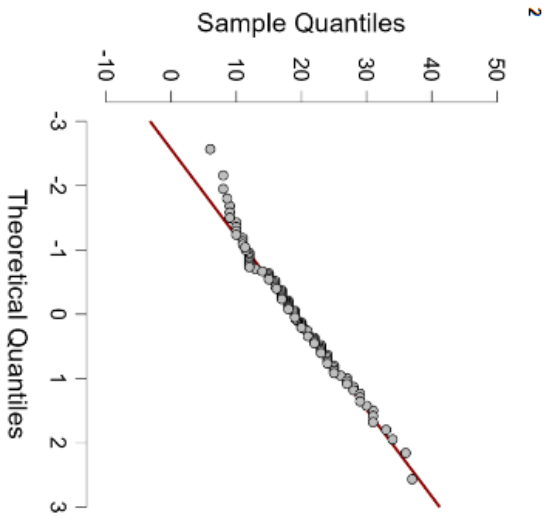
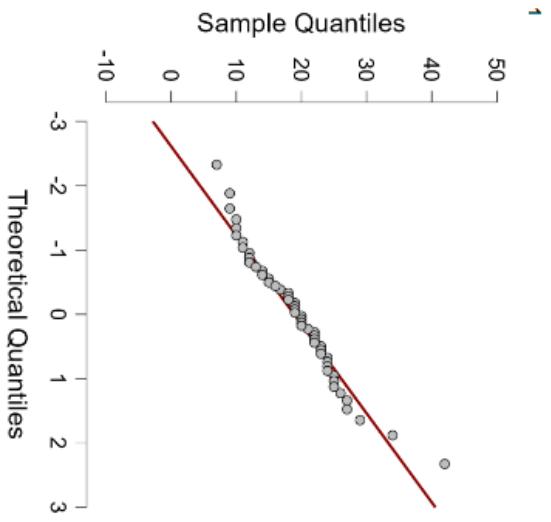
AVER_SOIR



ECRS_anxiety



ECRS_avoidance



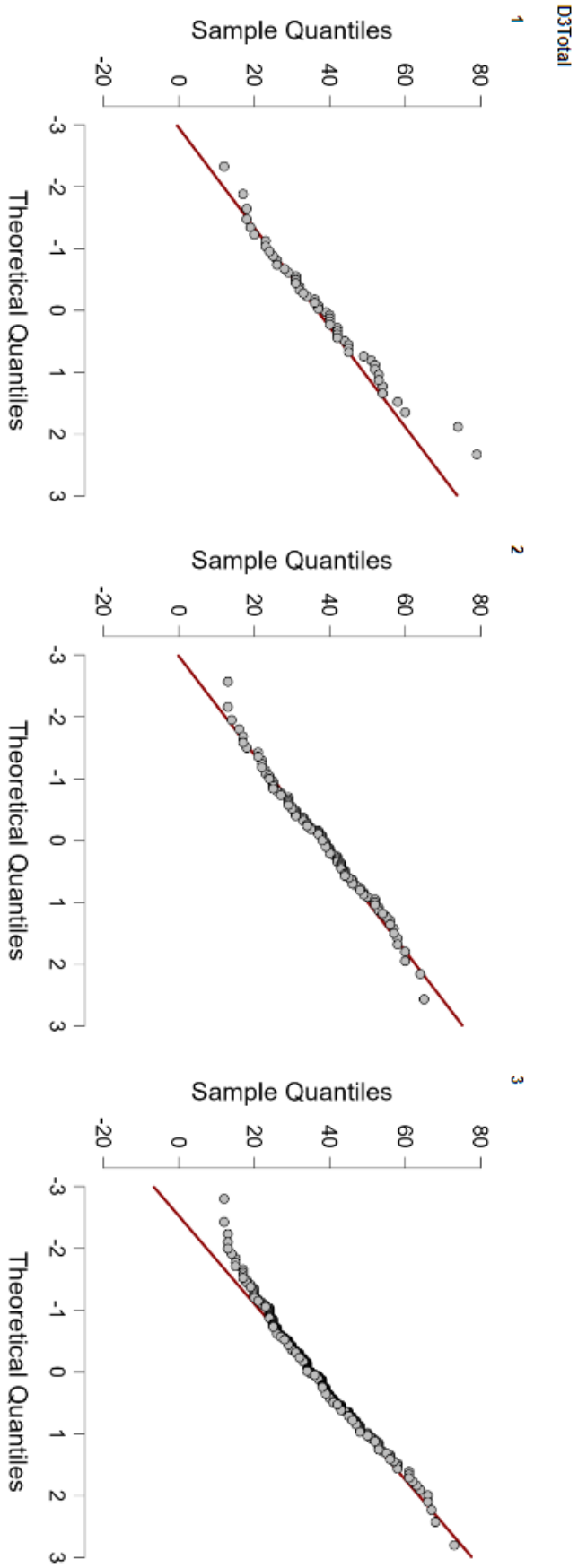


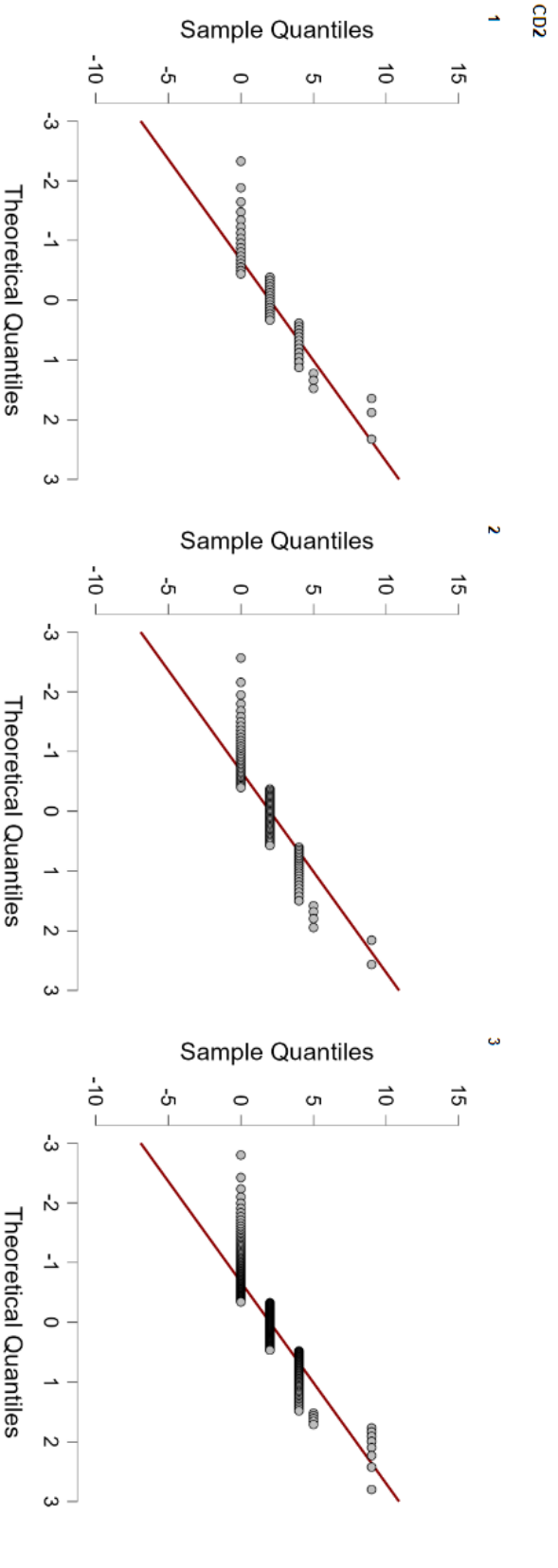
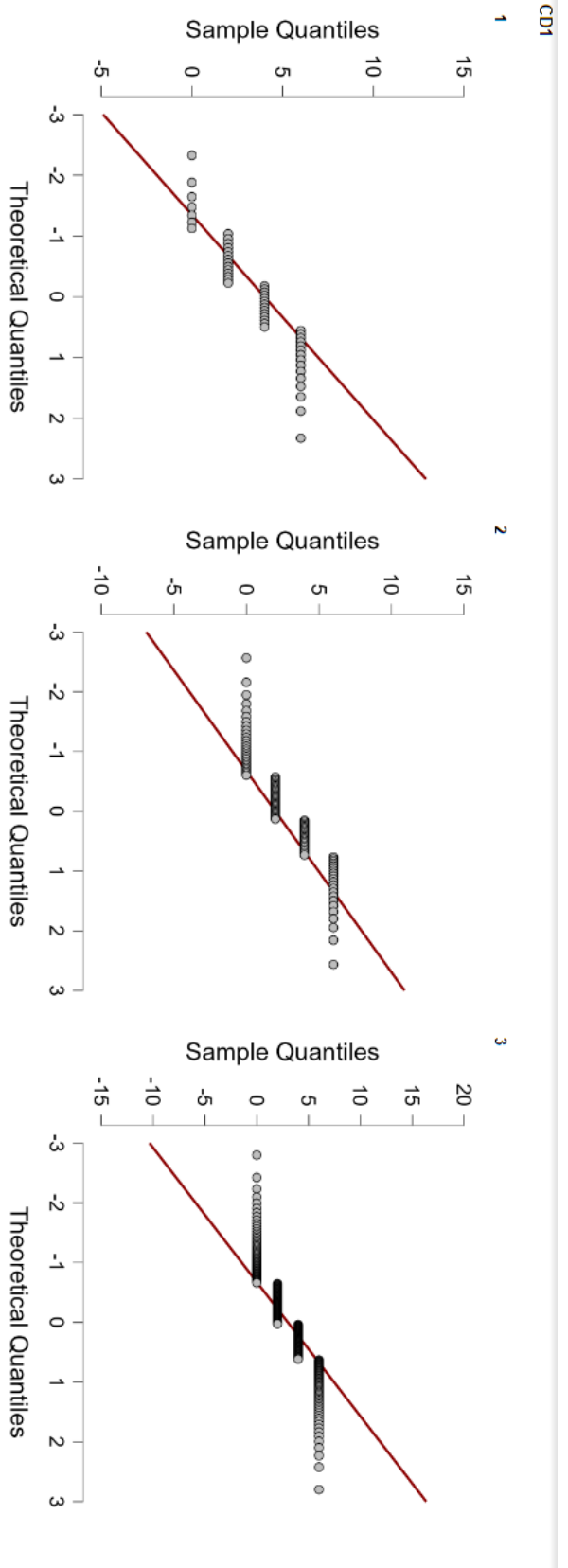
Table 3

Assumption of Homogeneity of Variances of Participants Single due to Interpersonal Problems, Single by Choice and Committed Participants on individual items of Cognitive Distortions Measure

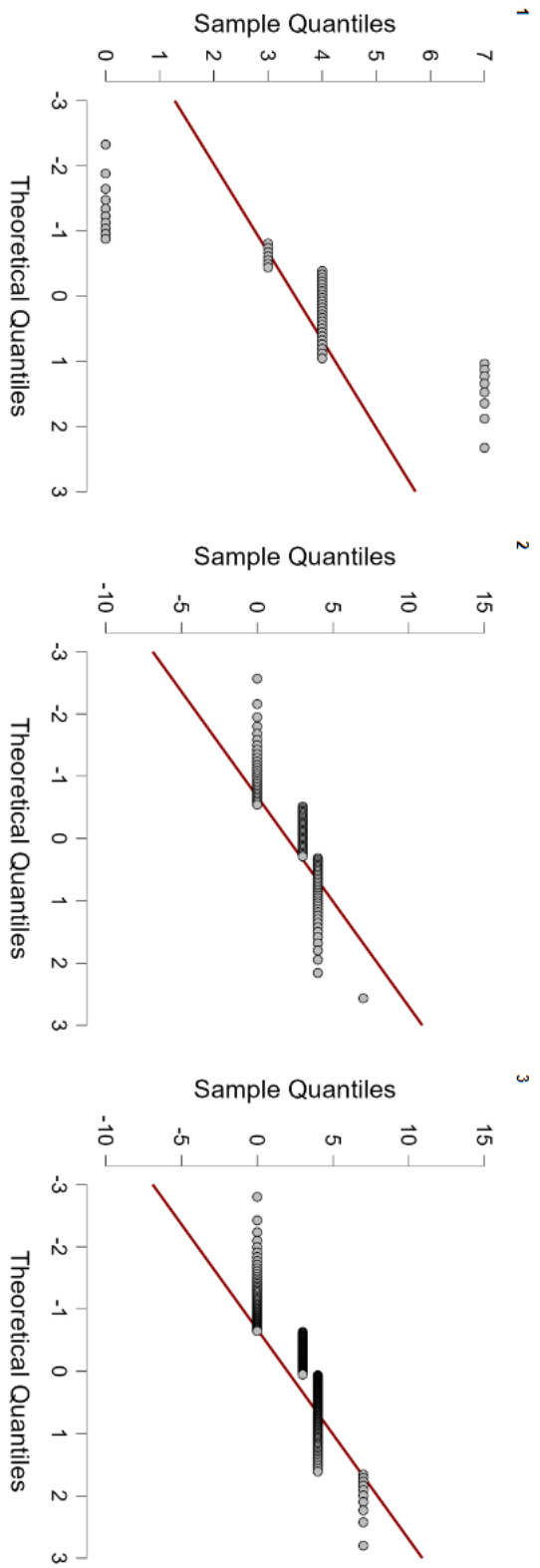
Measure	<i>F</i>	<i>df</i> ₁	<i>df</i> ₂	<i>p</i>
<i>Discounting the Positive</i>	1.15	2	339	.319
<i>Emotional Reasoning</i>	2.06	2	339	.129
<i>Labeling</i>	.09	2	339	.914
<i>Selective Abstraction</i>	3.12	2	339	.045
<i>Mind Reading</i>	1.61	2	339	.202
<i>Overgeneralisation</i>	2.98	2	339	.052
<i>Should Statements</i>	1.46	2	339	.235
<i>What if?</i>	.36	2	339	.7
<i>Unfair Comparisons</i>	1.75	2	339	.175

Figure 3

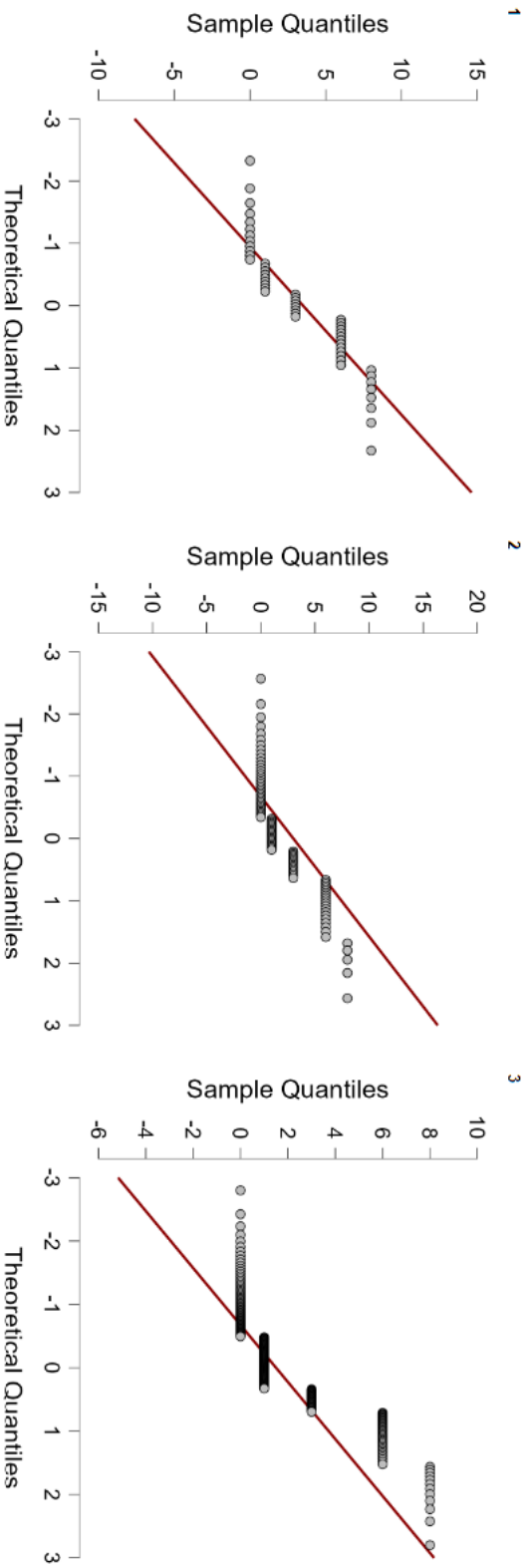
Q-Q plots of Participants Single due to Interpersonal Problems, Single by Choice and Committed Participants on individual items of Cognitive Distortions Measure



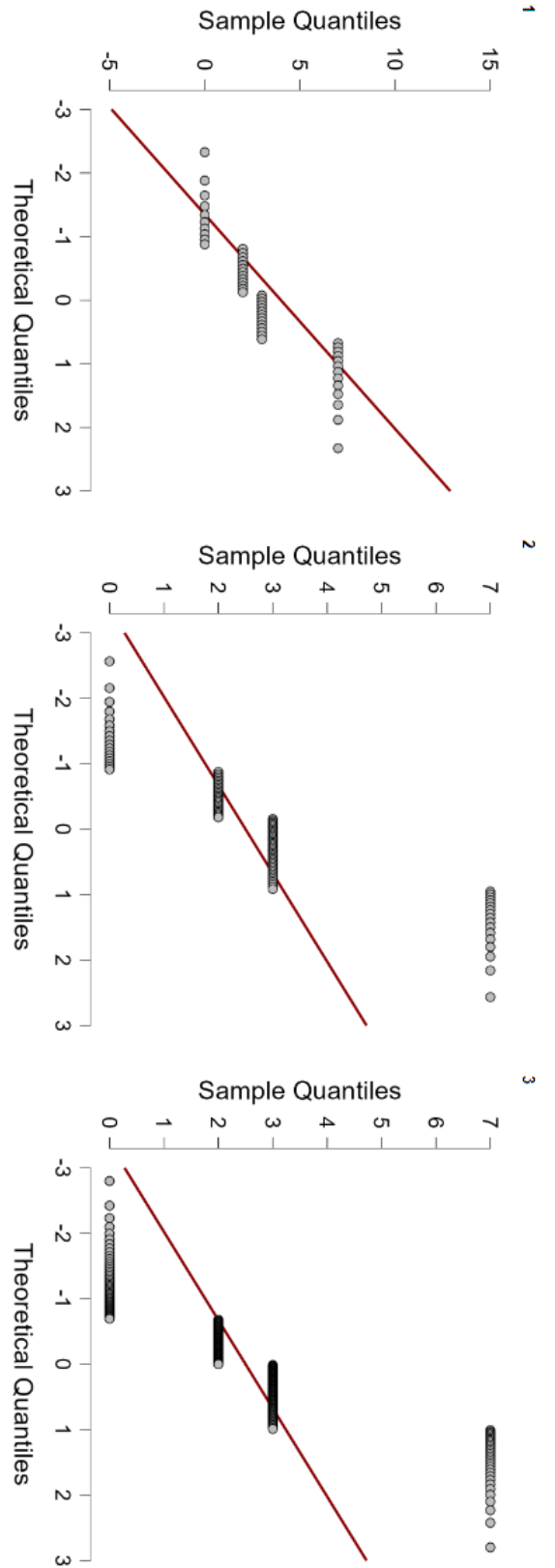
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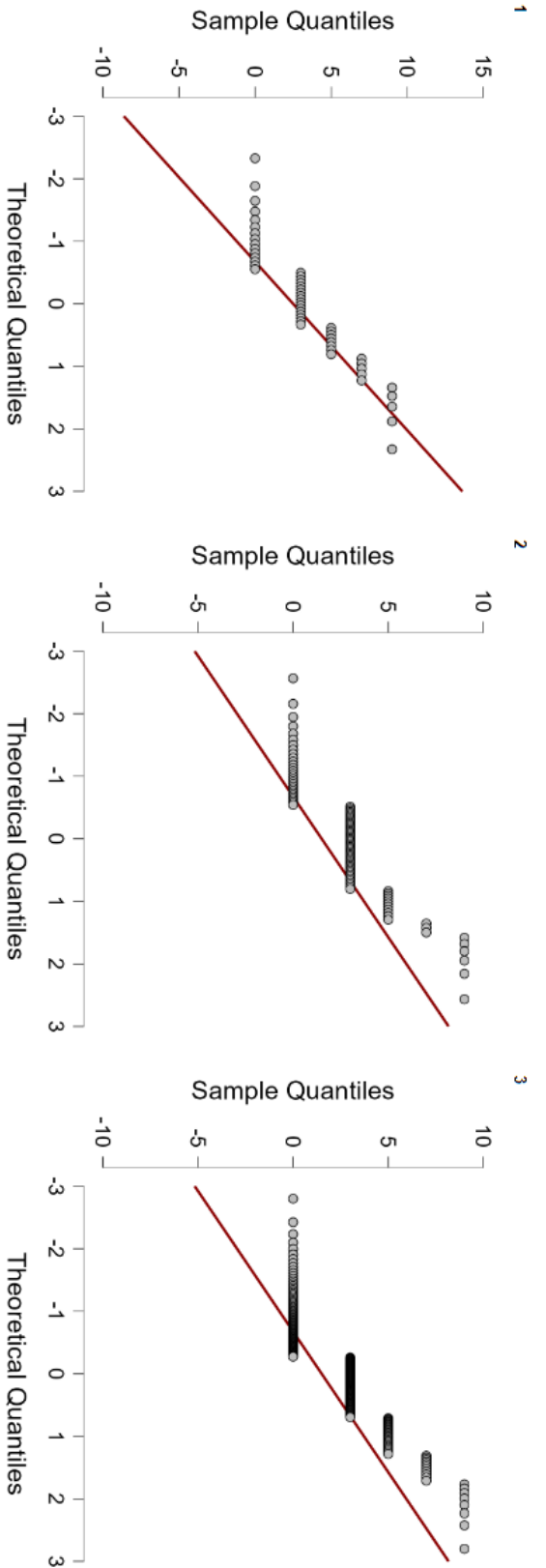
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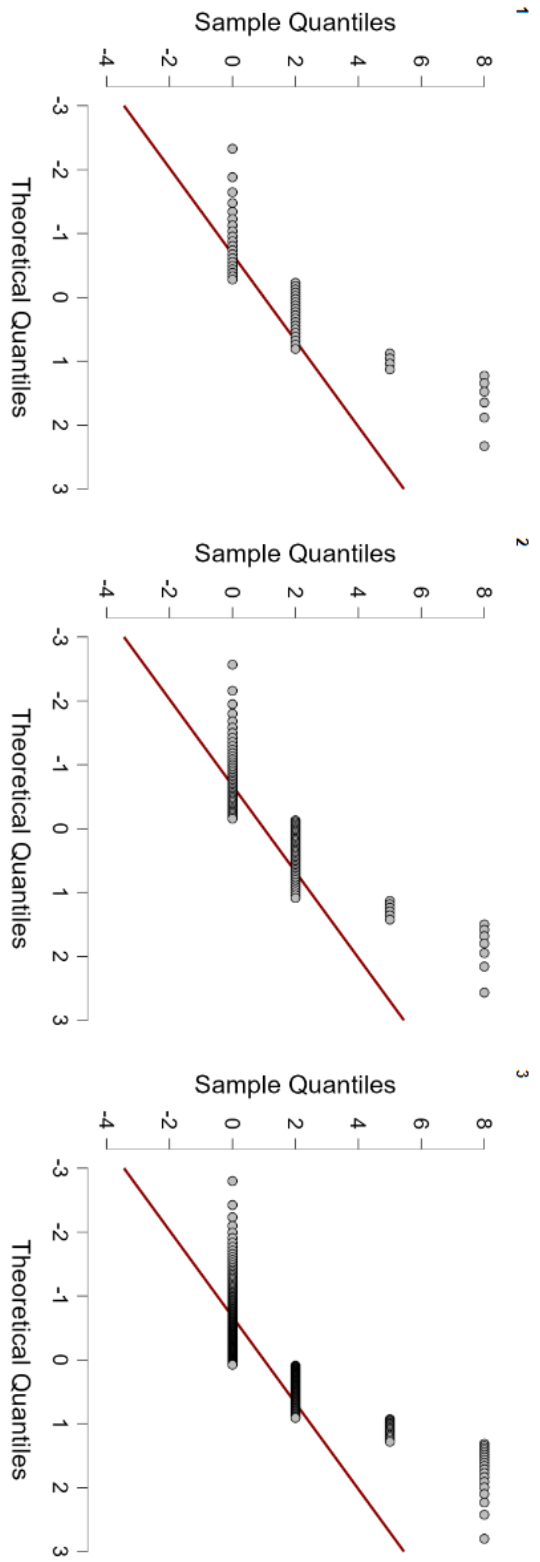
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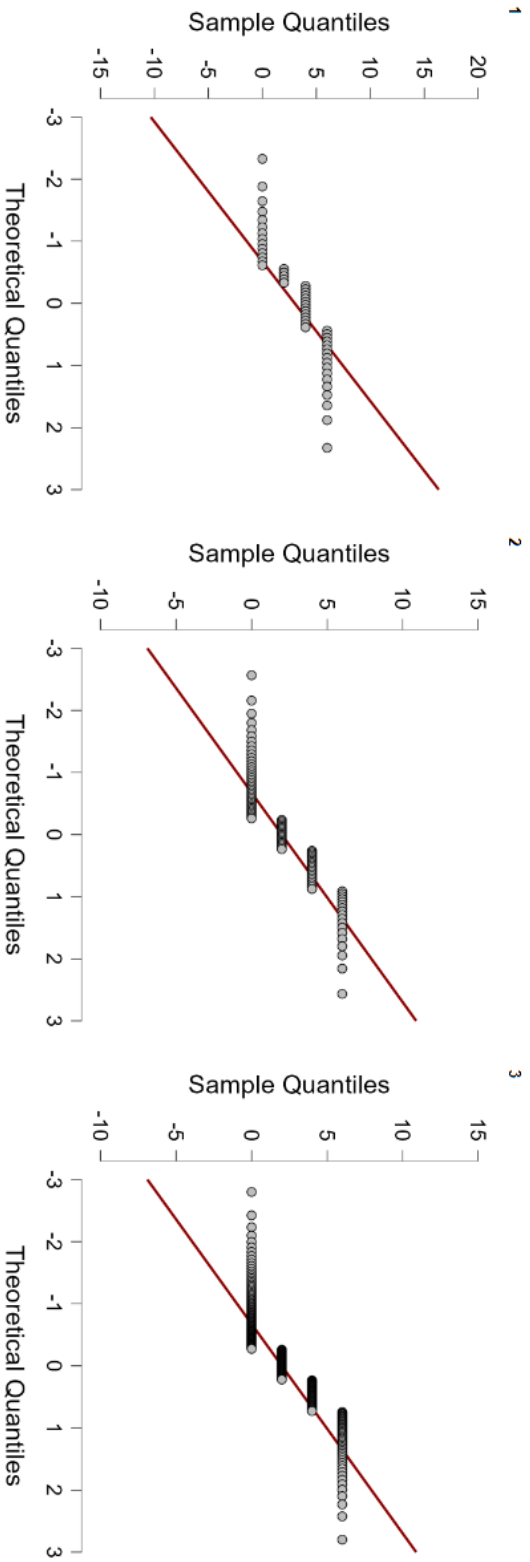
CD6



CD7



CD8



CD9

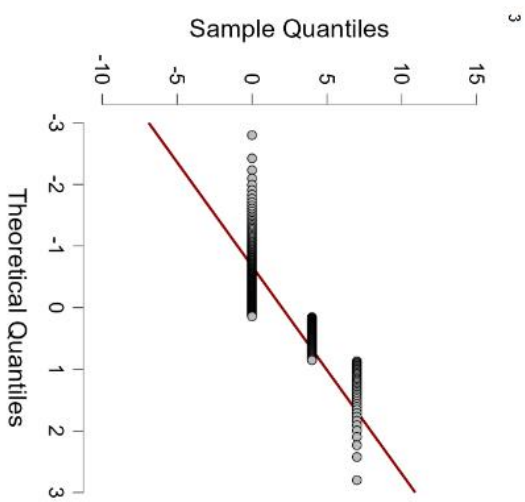
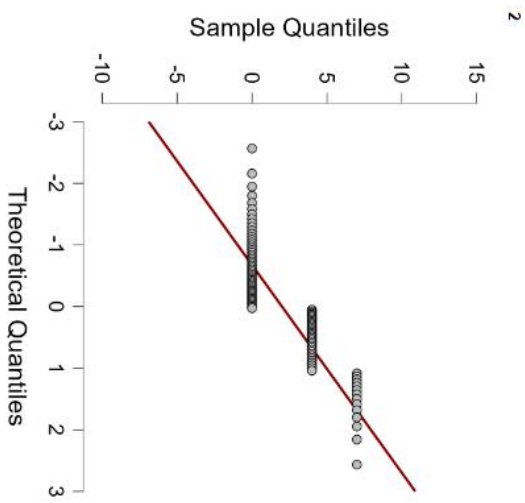
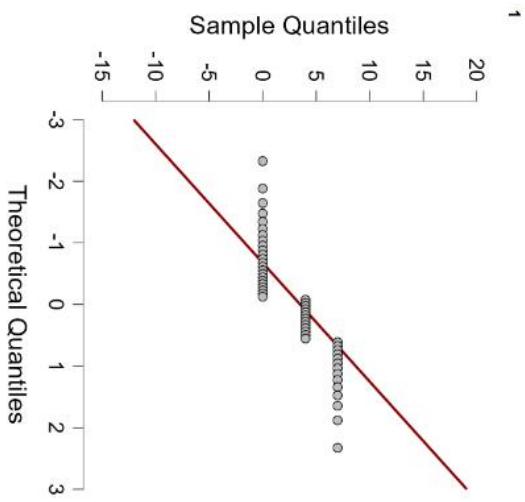


Table 4*Variance Inflation Factors for regression model for Depression*

Predictor Variable	Tolerance	VIF
Step 1		
Single due to interpersonal problems	.95	1.05
Single by choice	.95	1.05
Step 2		
Single due to interpersonal problems	.94	1.07
Single by choice	.95	1.05
Cognitive Distortions	.98	1.02

Table 5*Variance Inflation Factors for Regression Model for Anxiety*

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
<i>Step 1</i>		
<i>Single due to interpersonal problems</i>	.95	1.05
<i>Single by choice</i>	.95	1.05
<i>Step 2</i>		

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
<i>Single due to interpersonal problems</i>	.94	1.07
<i>Single by choice</i>	.95	1.05
<i>Cognitive Distortions</i>	.98	1.02

Appendix T

Table 1

Assumption of Homogeneity of Variances of Single vs. Participants in Committed Relationships on Measures of Depression, Anxiety, Cognitive Distortions, Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment

Measure	<i>F</i>	<i>df</i> ₁	<i>df</i> ₂	<i>p</i>
Depression	.001	1	264	.975
Anxiety	.16	1	264	.693
Cognitive Distortions	.96	1	264	.328
Mating Performance	.17	1	264	.681
Sociosexuality	1.21	1	264	.272
Avoidant Attachment	.14	1	264	.708
Anxious Attachment	.04	1	264	.84

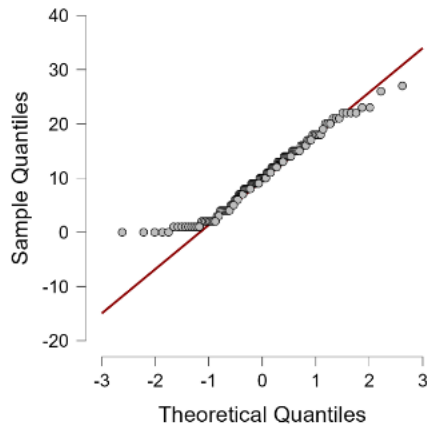
Figure 1

Q-Q plots of Single and Committed Participants on Measures of Depression, Anxiety, Cognitive Distortions, Mating Performance, Sociosexuality, Avoidant Attachment, Anxious Attachment

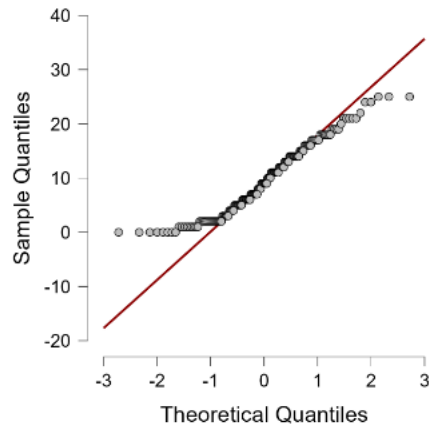
Q-Q Plots

PHQtotal

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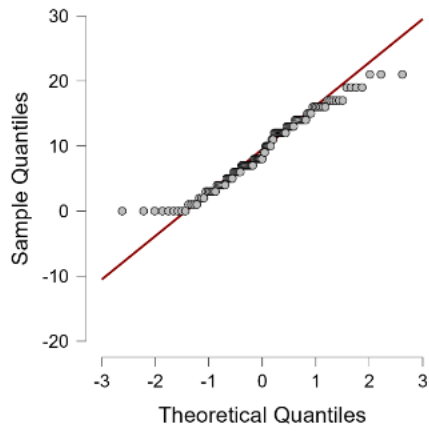


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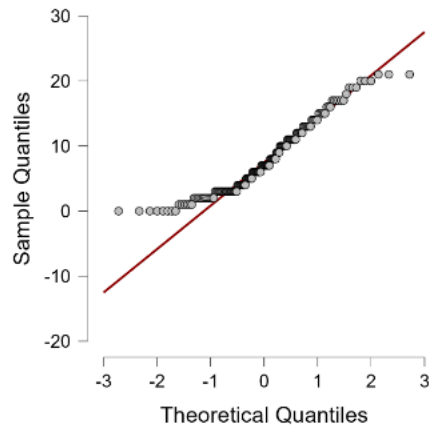


GADtotal

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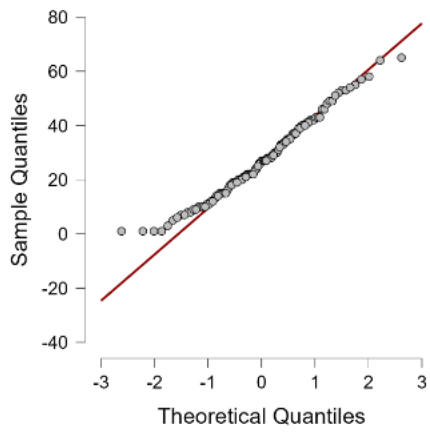


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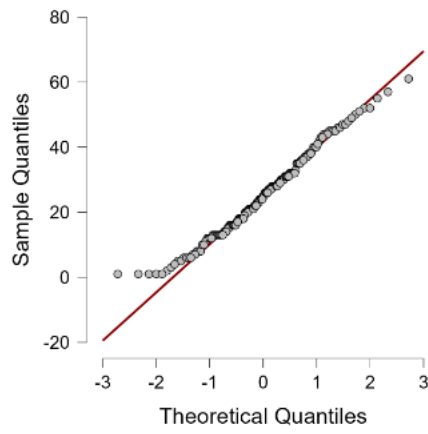


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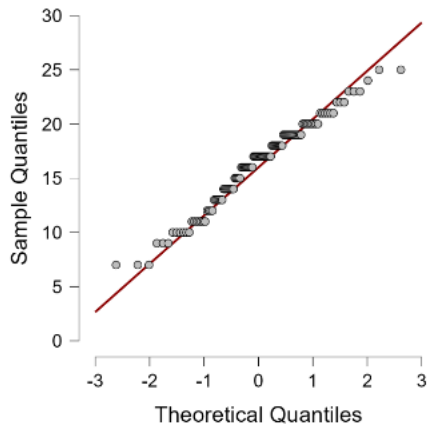


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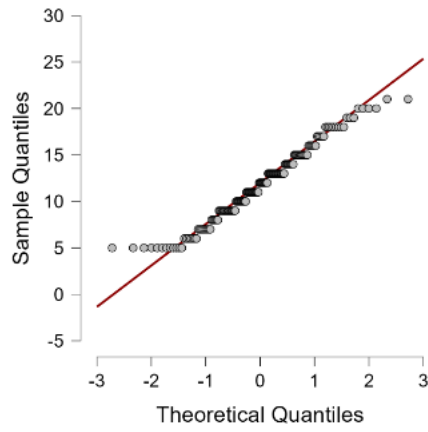


MP Stotal

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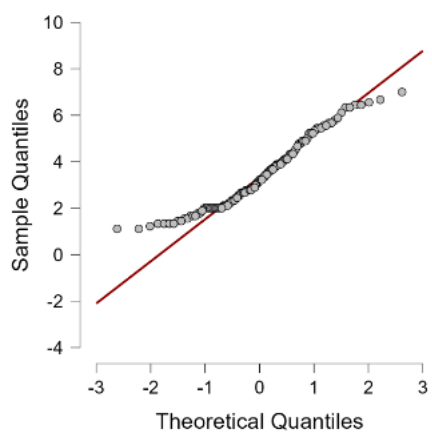


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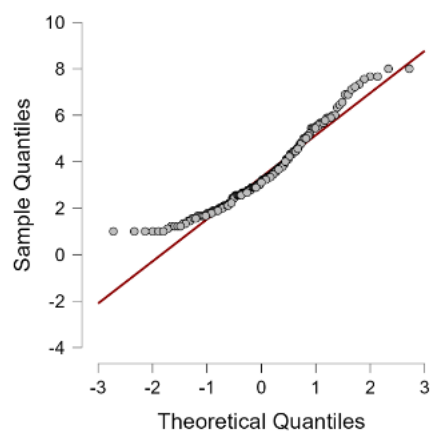


AVER_SOIR

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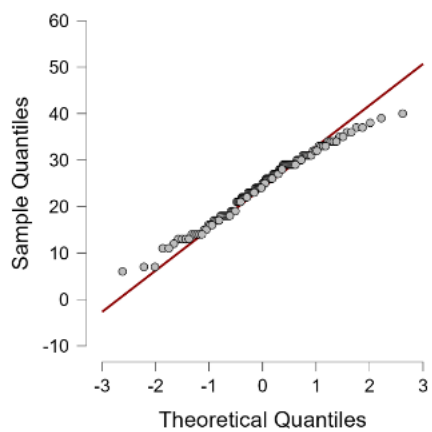


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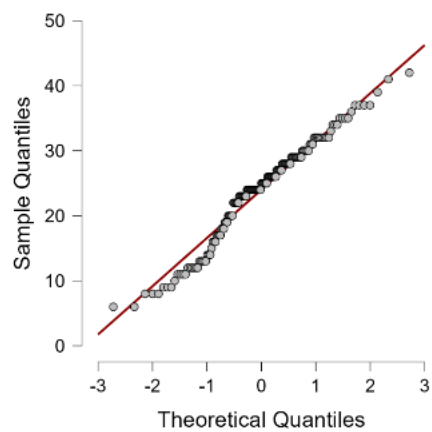


ECSR_anxiety

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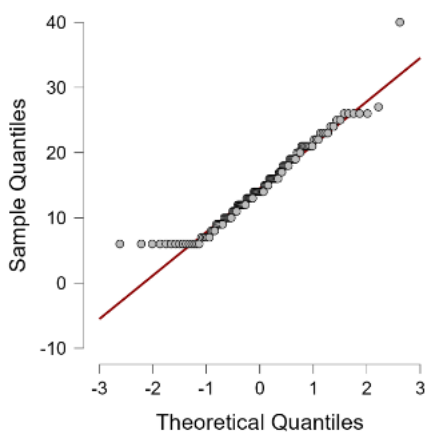


2



ECSR_avoidance

1



2

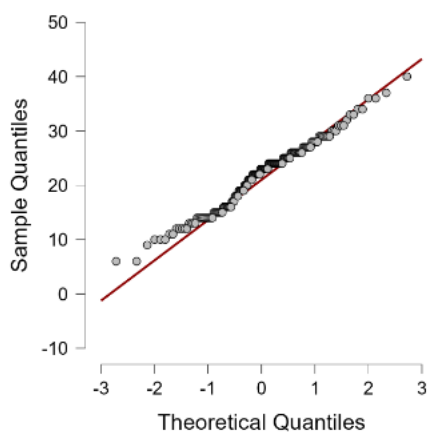
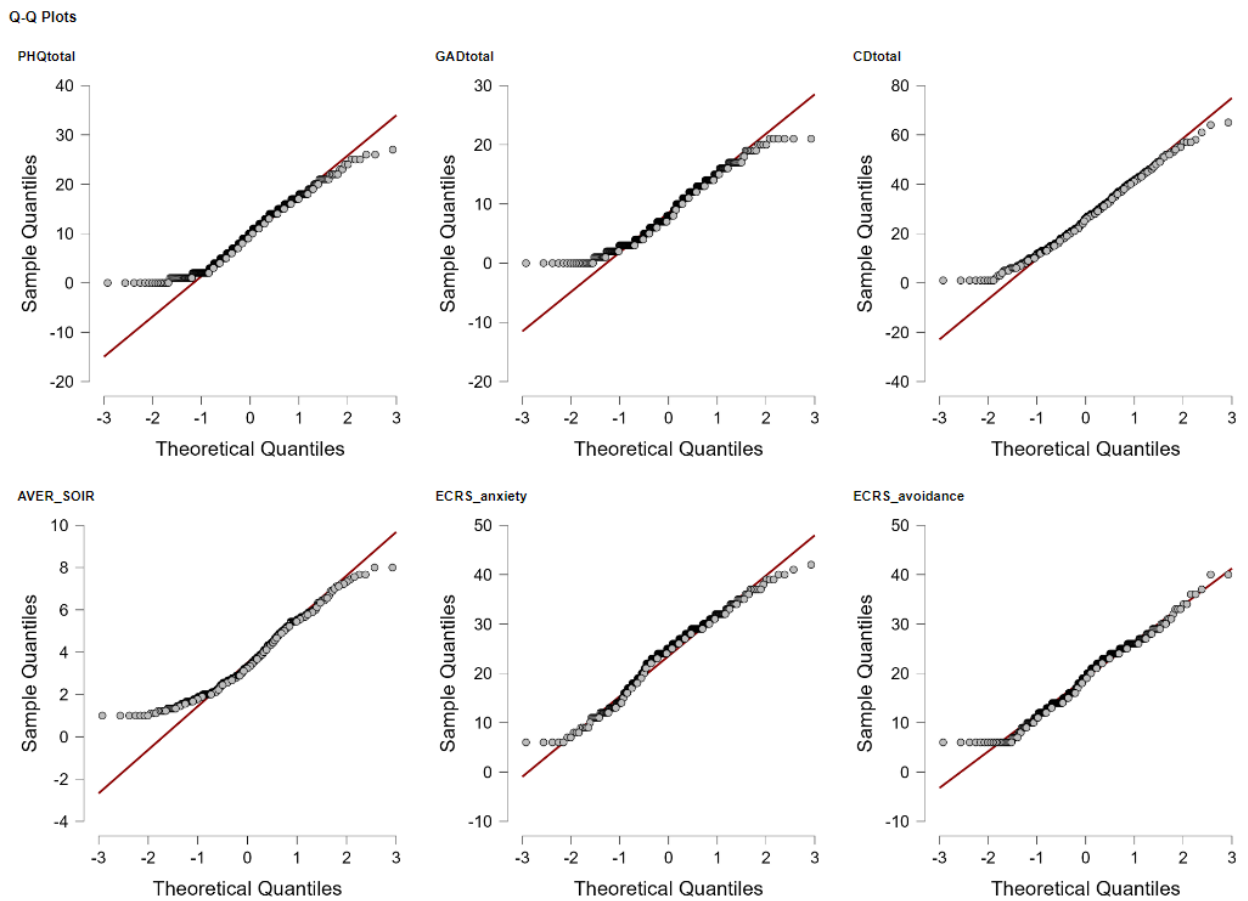


Figure 2

Q-Q plots of participants Single due to insecurities, Single by Choice, Single for Freedom, Single due to interdependency difficulties and Committed Participants on Measures of Depression, Anxiety, total Cognitive Distortions, Selective Abstraction, What if?, Labeling, Emotional Abuse, Sociosexuality, Avoidant Attachment, Anxious Attachment, Social Support, Locus of Control, Sexism



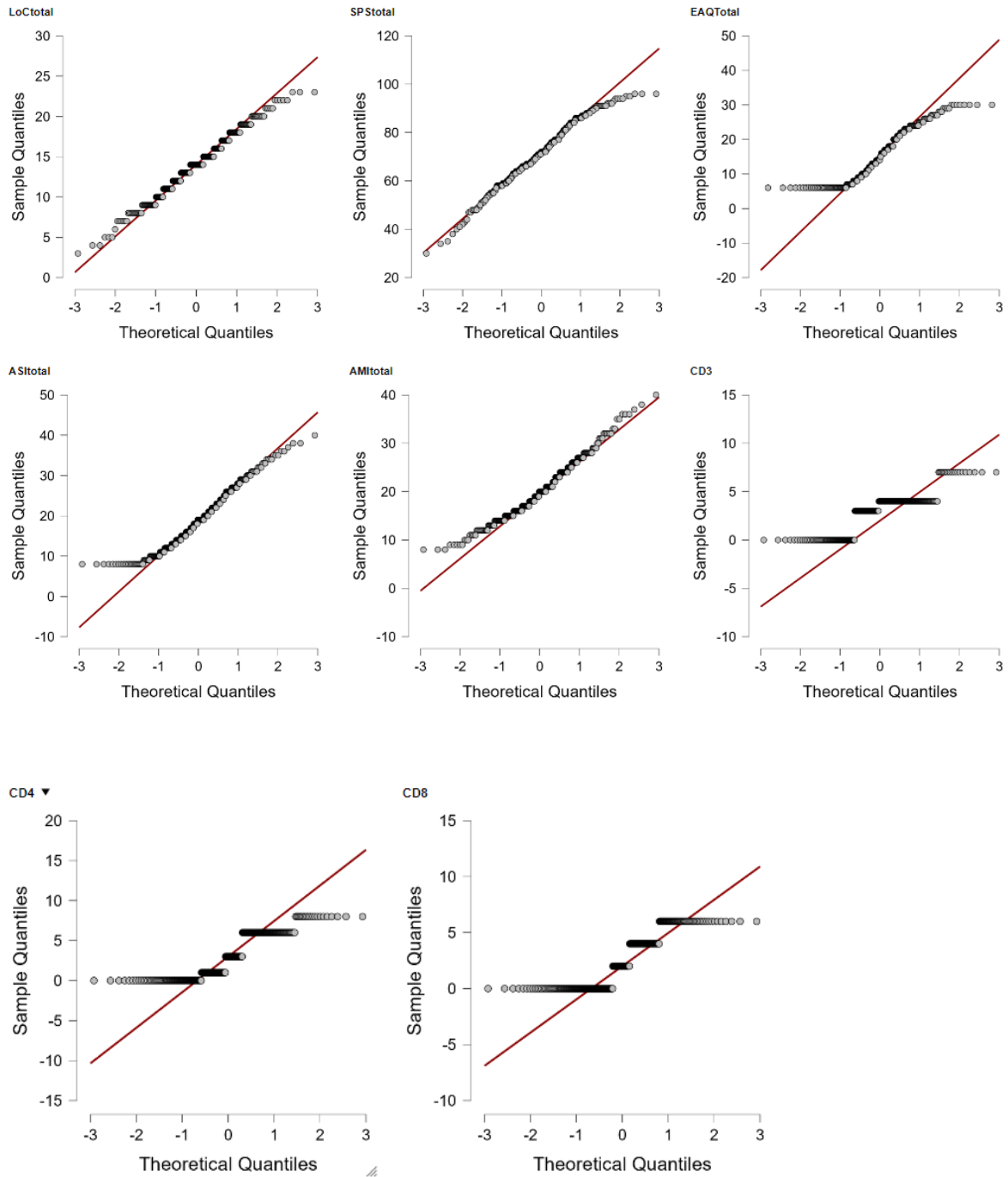
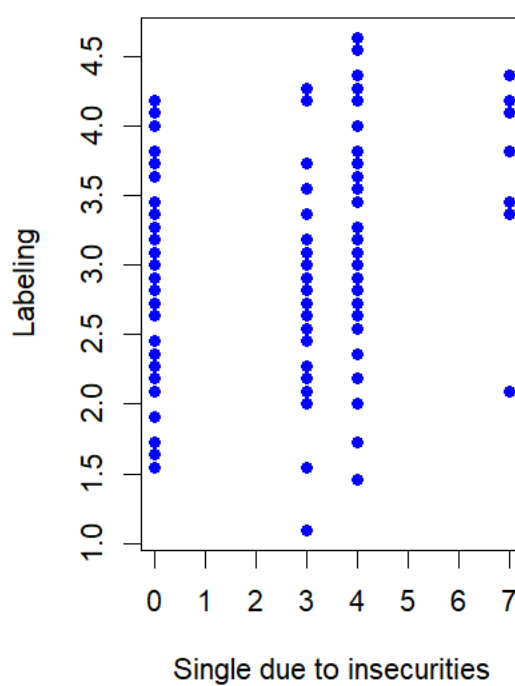
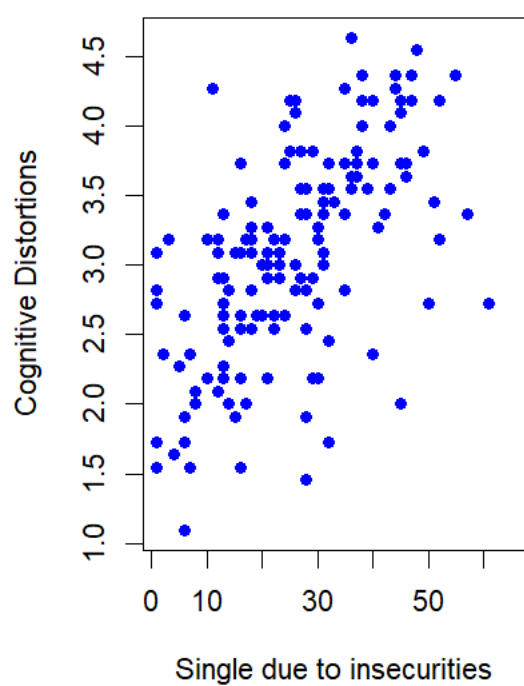
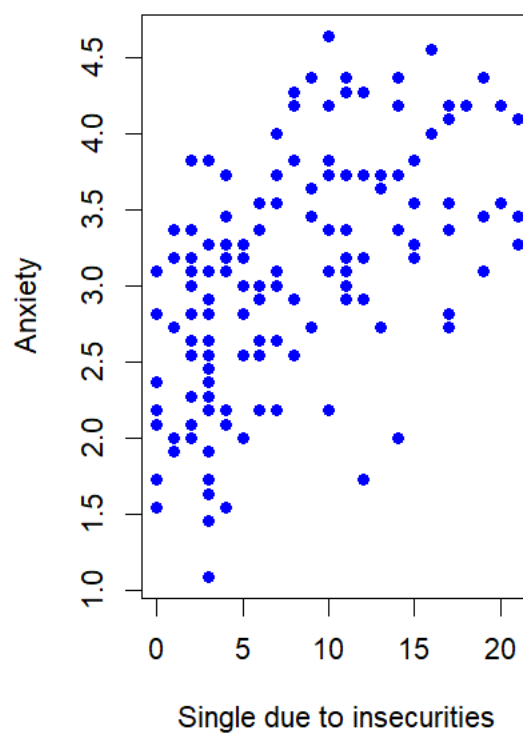
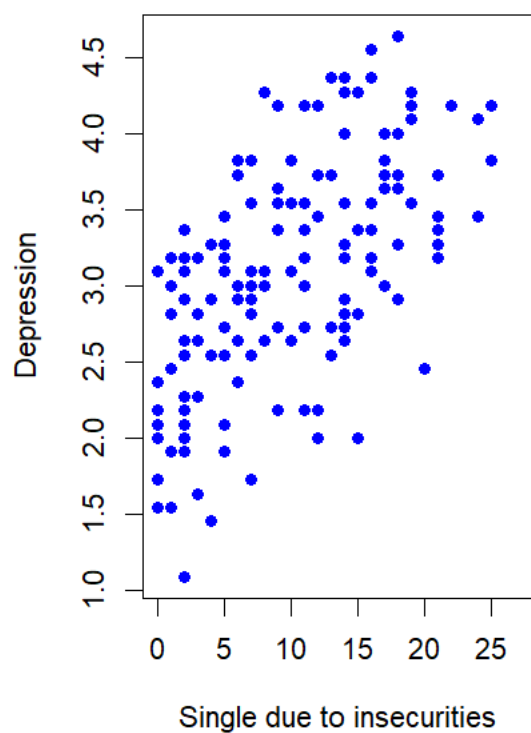
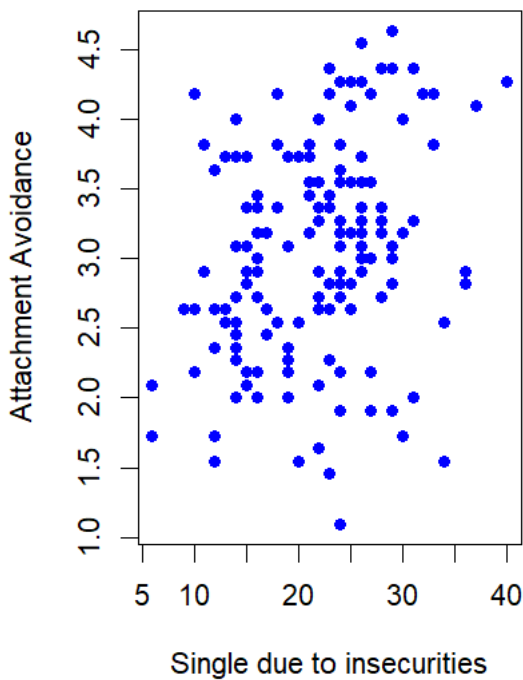
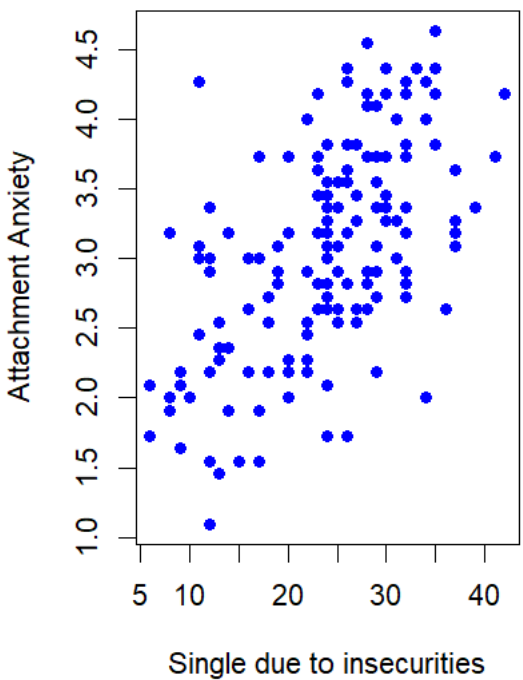
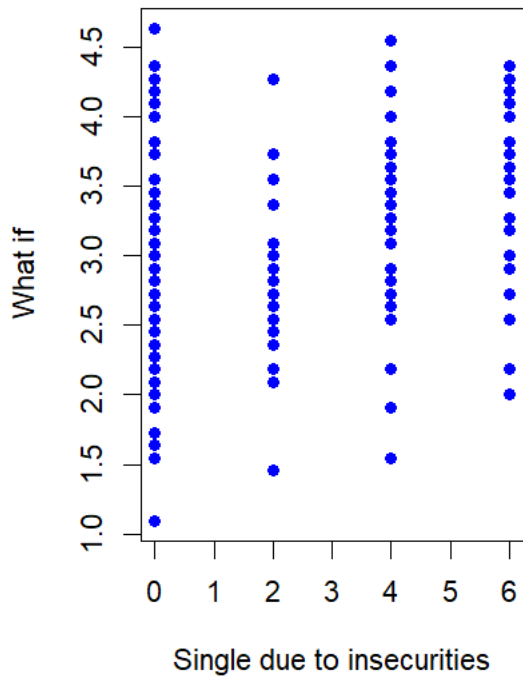
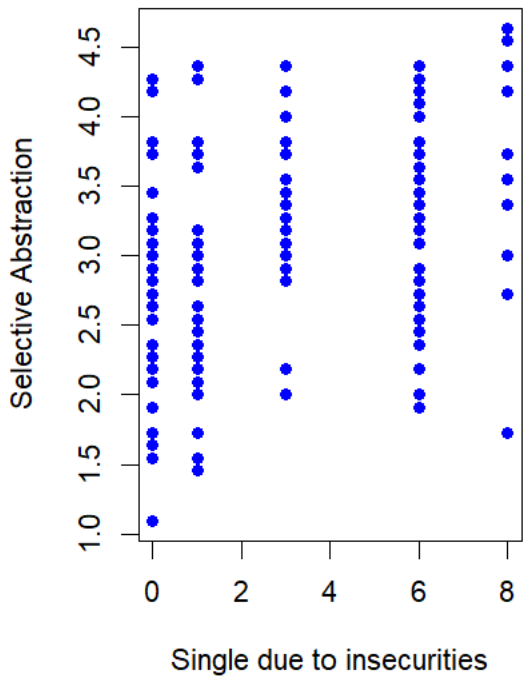


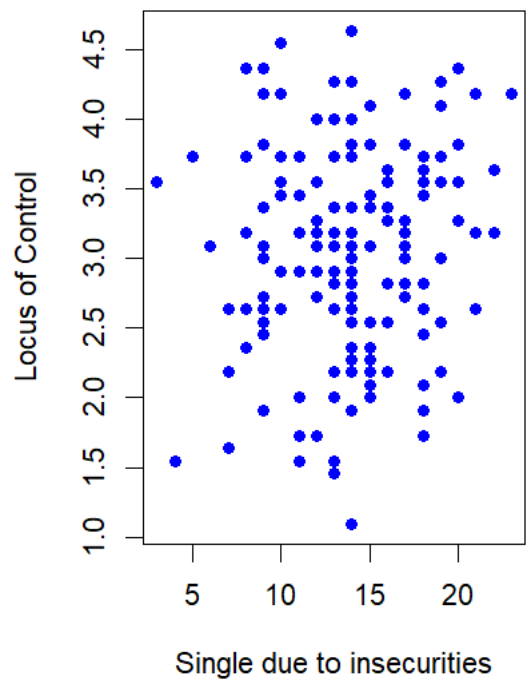
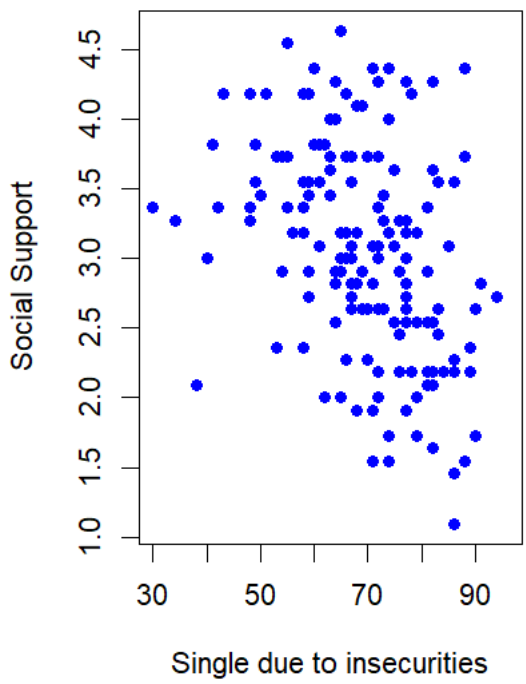
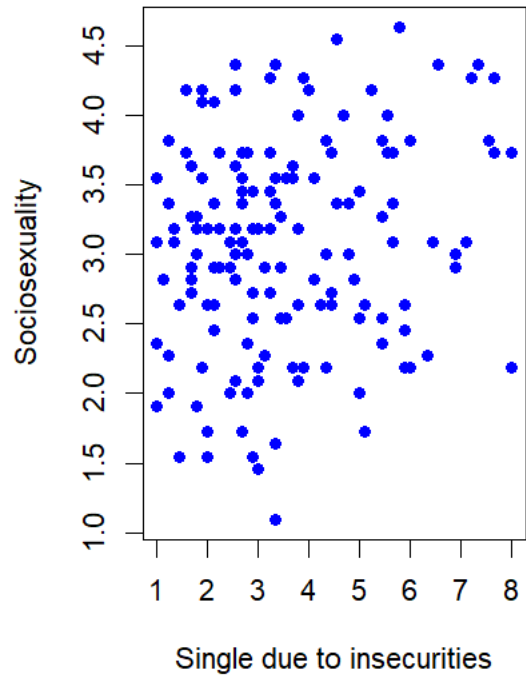
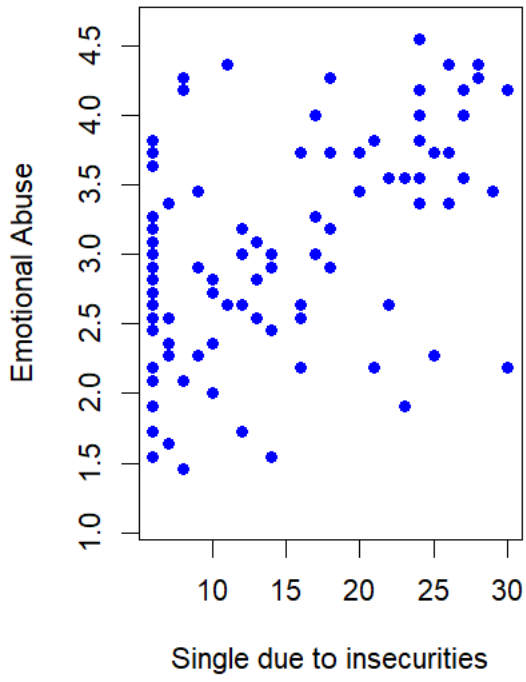
Figure 3

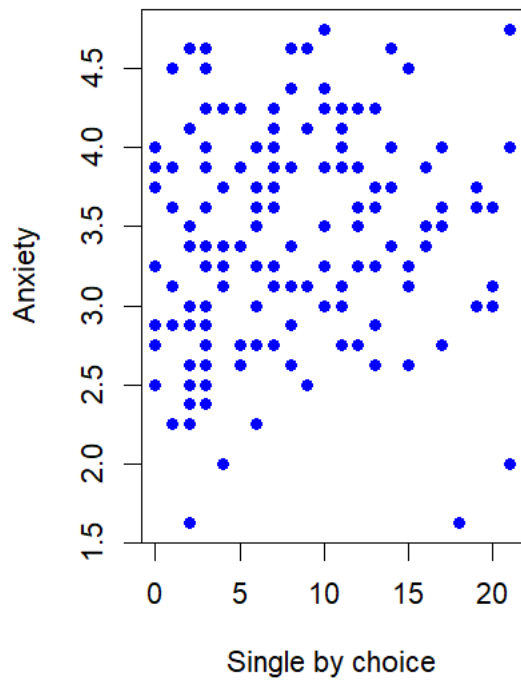
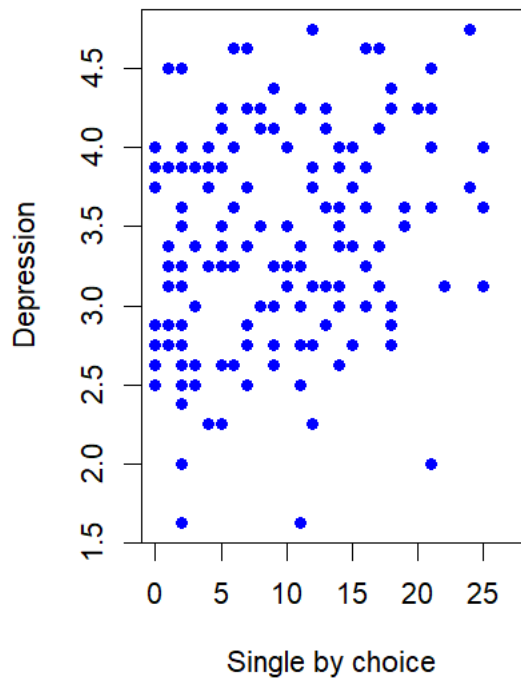
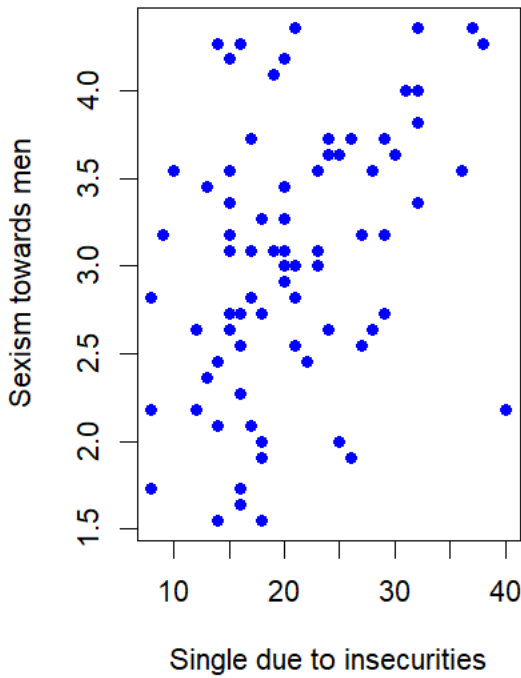
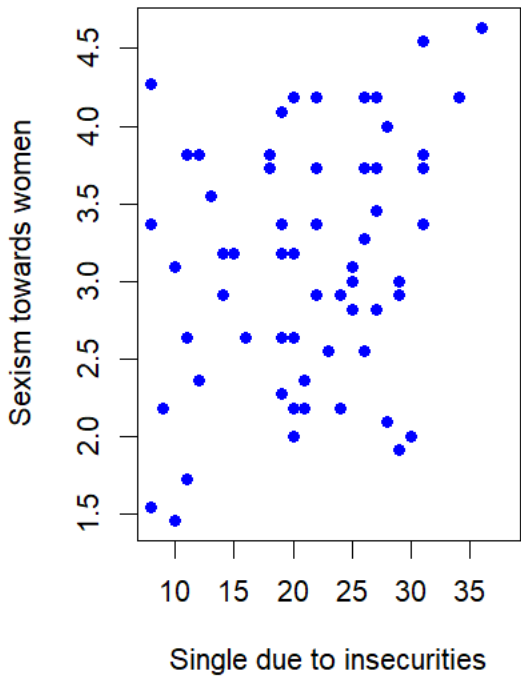
Scatterplots of participants Single due to insecurities, Single by Choice, Single for Freedom, Single due to interdependency difficulties and Committed Participants on Measures of Depression, Anxiety, total Cognitive Distortions, Selective Abstraction, What if?, Labeling,

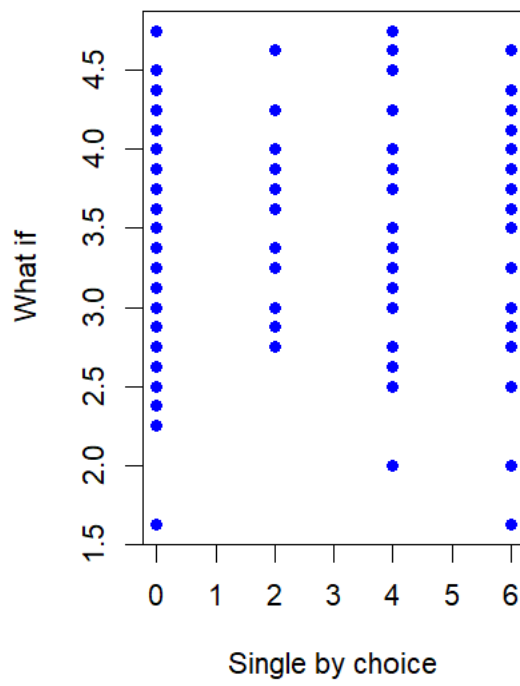
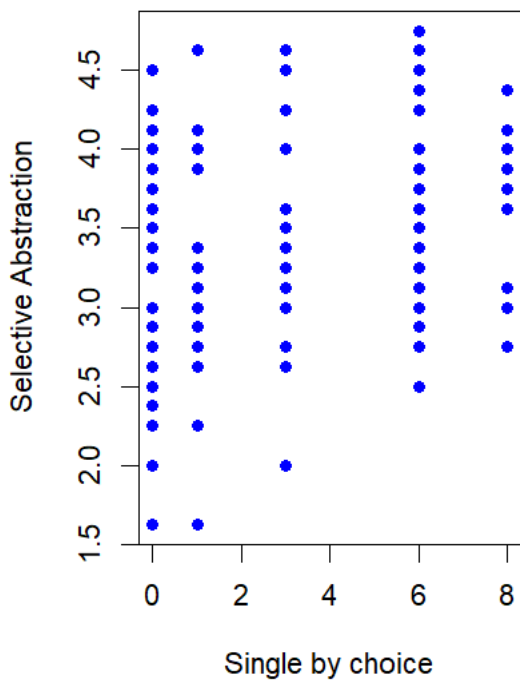
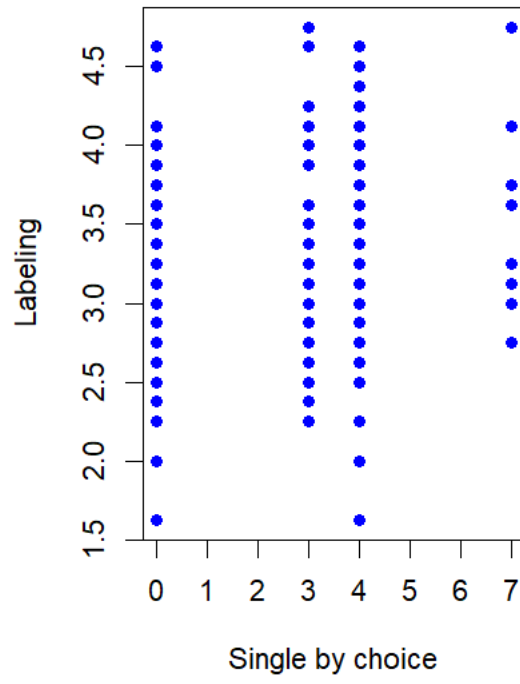
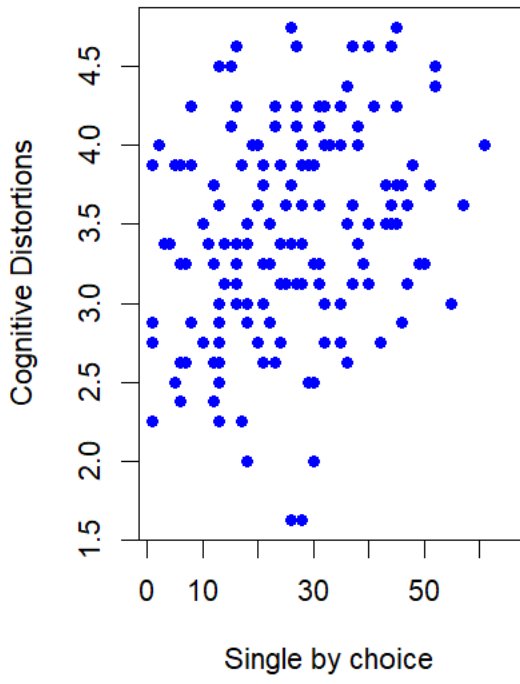
Emotional Abuse, Sociosexuality, Avoidant Attachment, Anxious Attachment, Social Support, Locus of Control, Sexism

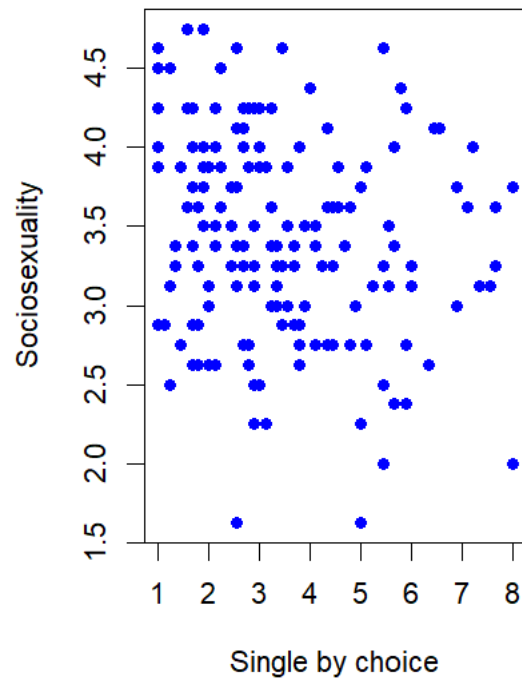
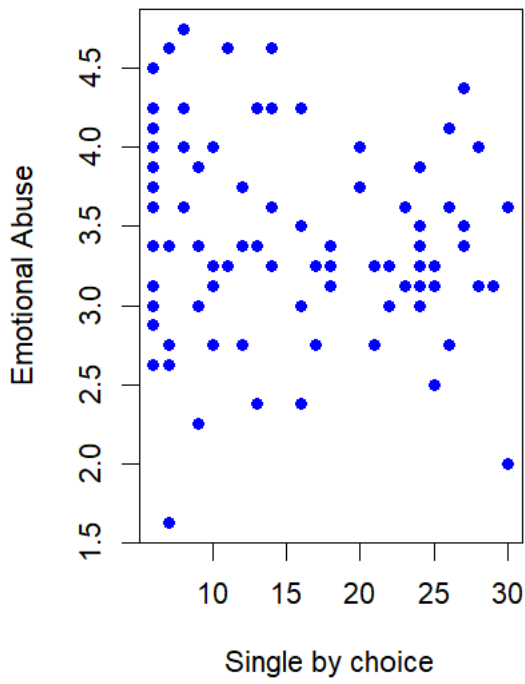
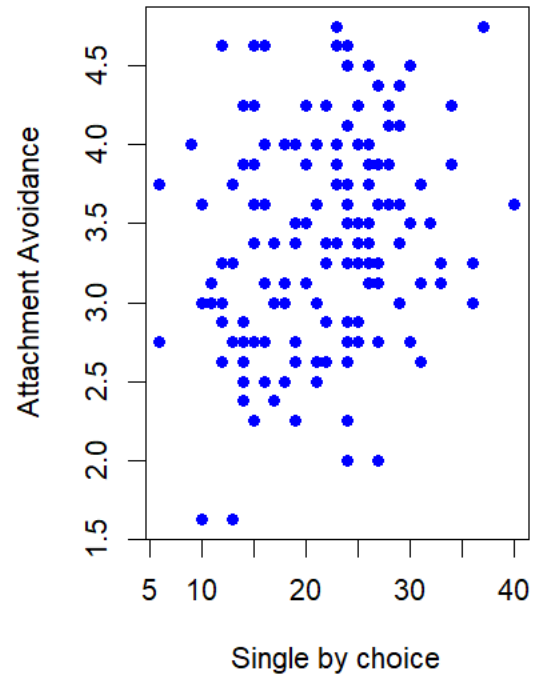
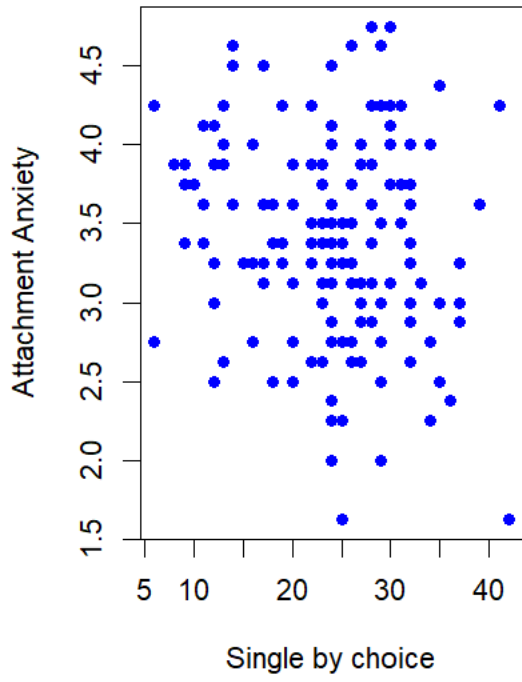


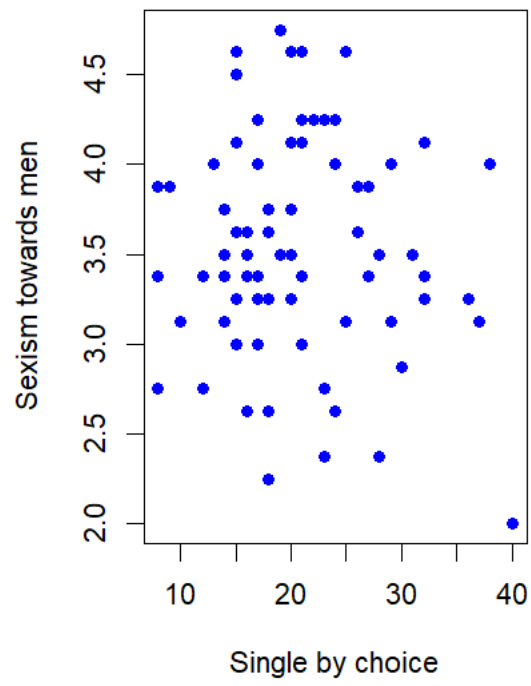
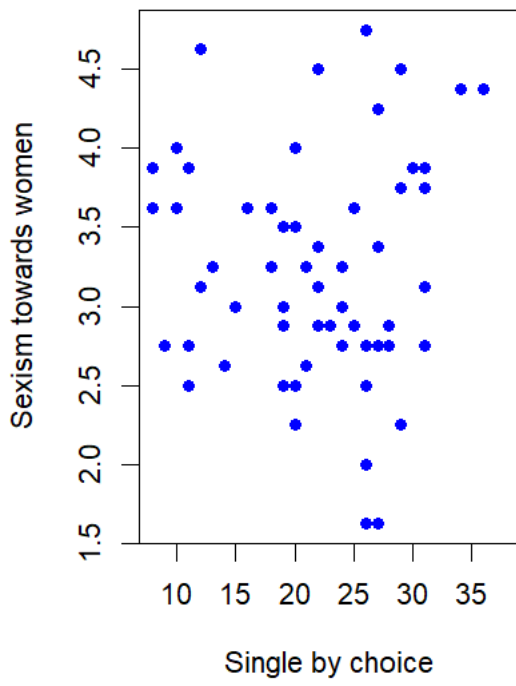
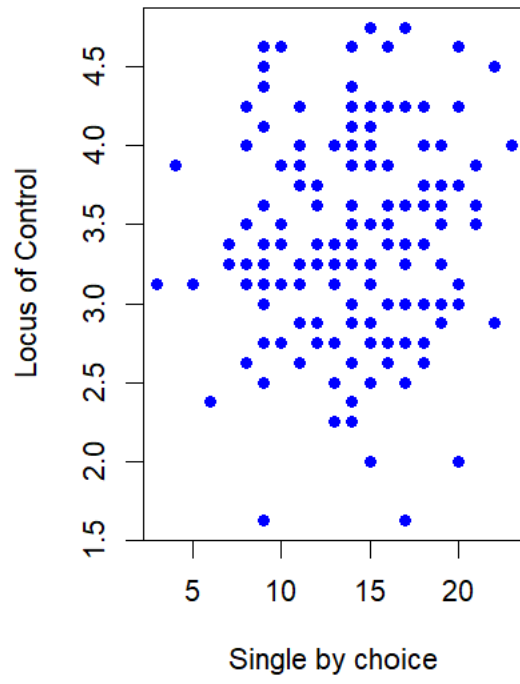
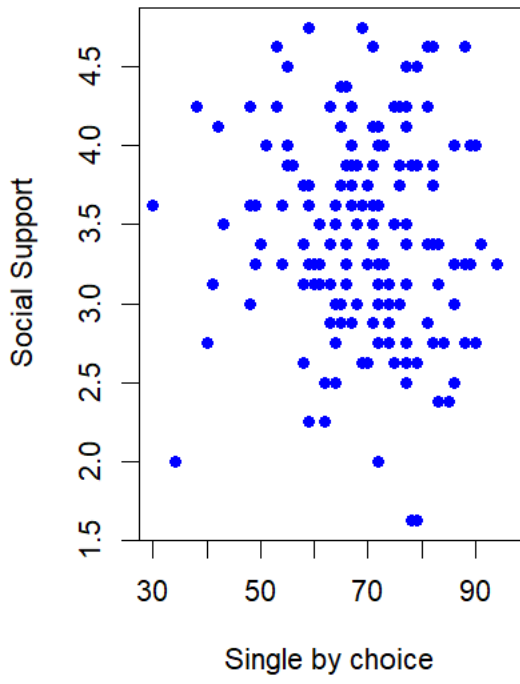


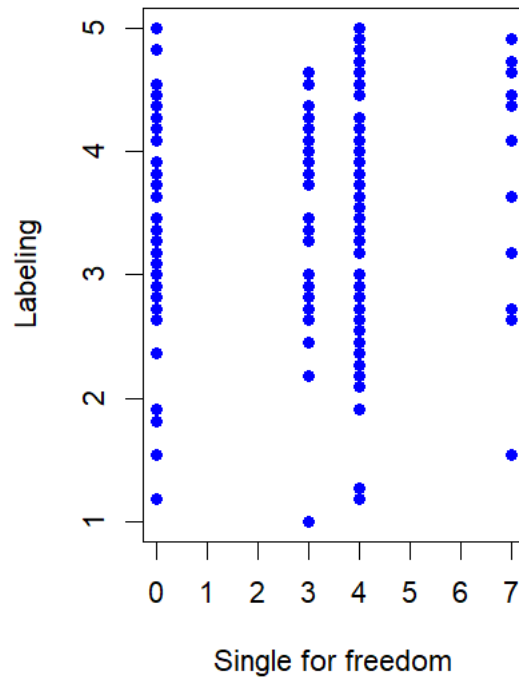
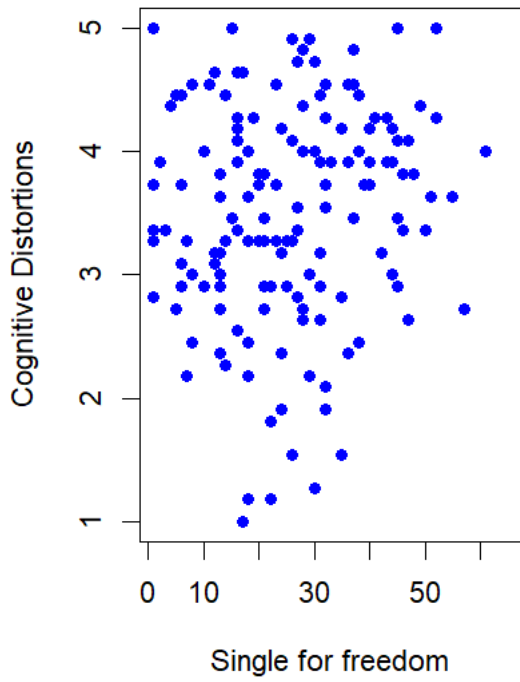
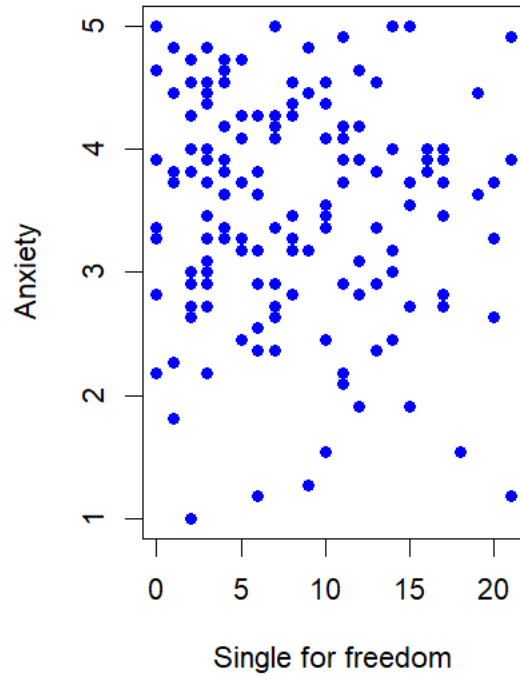
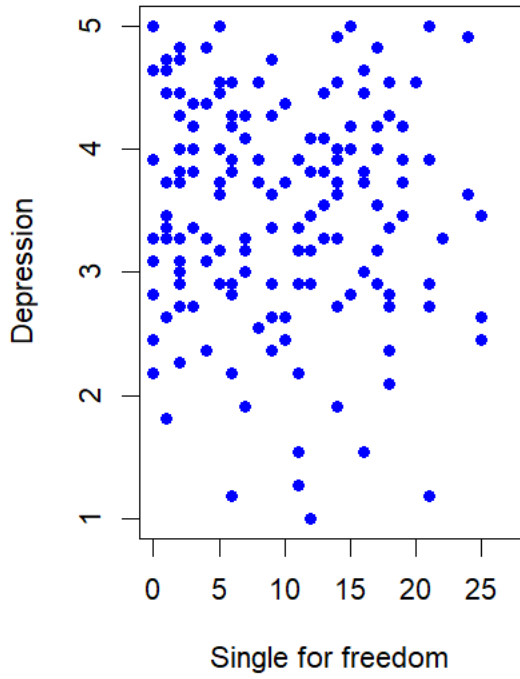


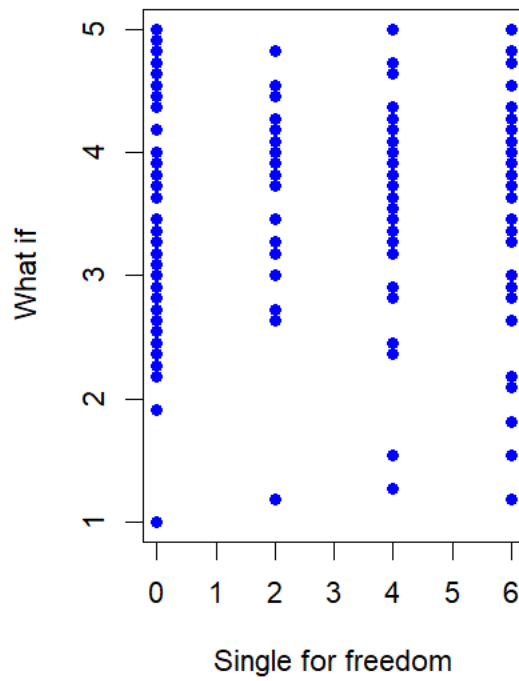
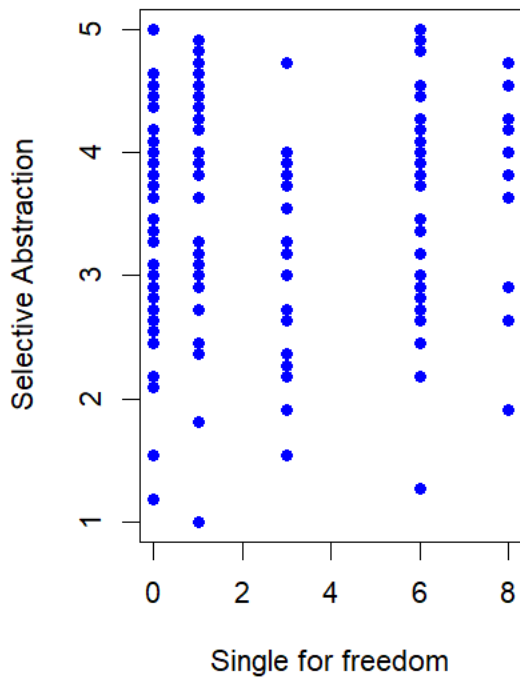
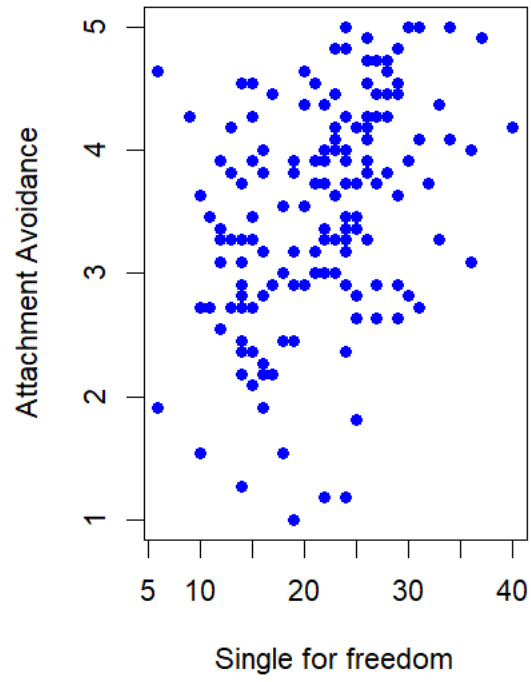
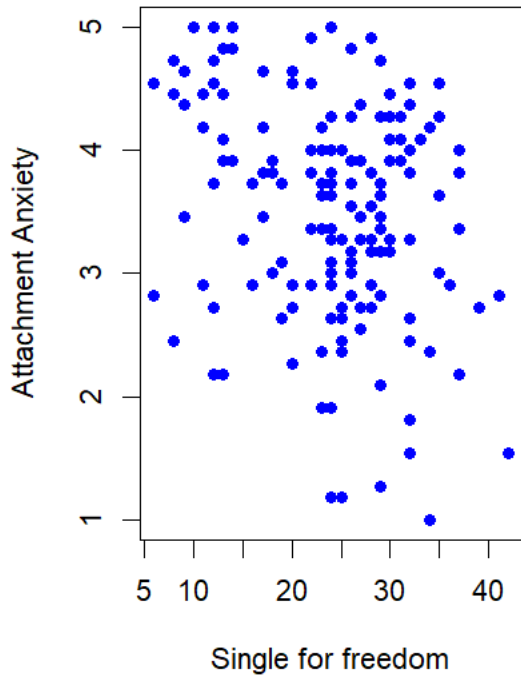


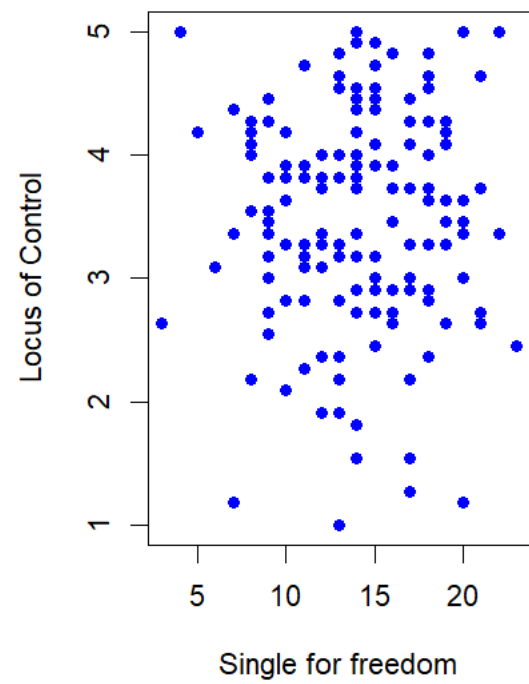
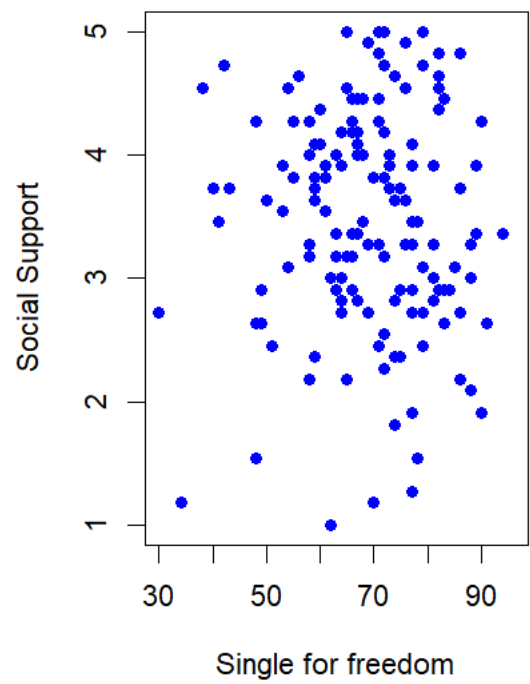
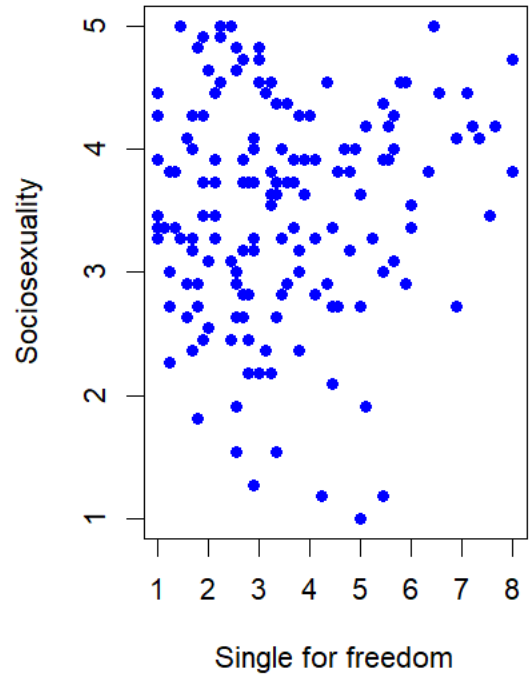
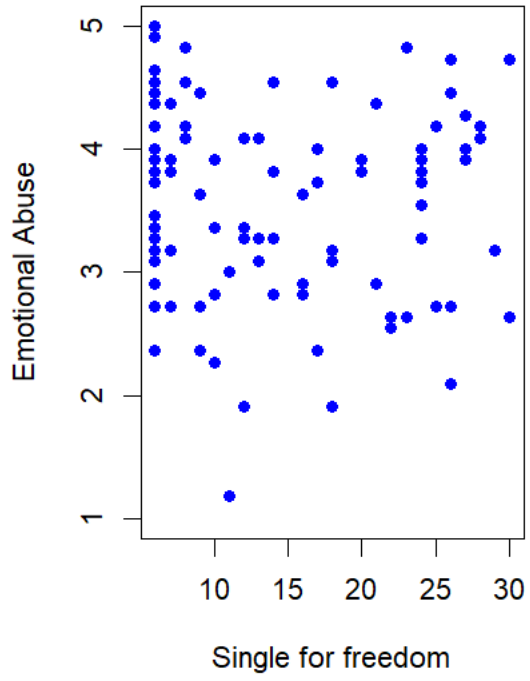


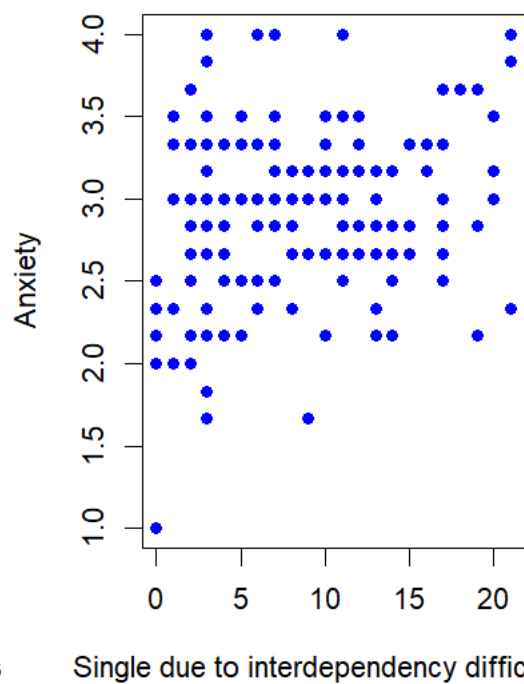
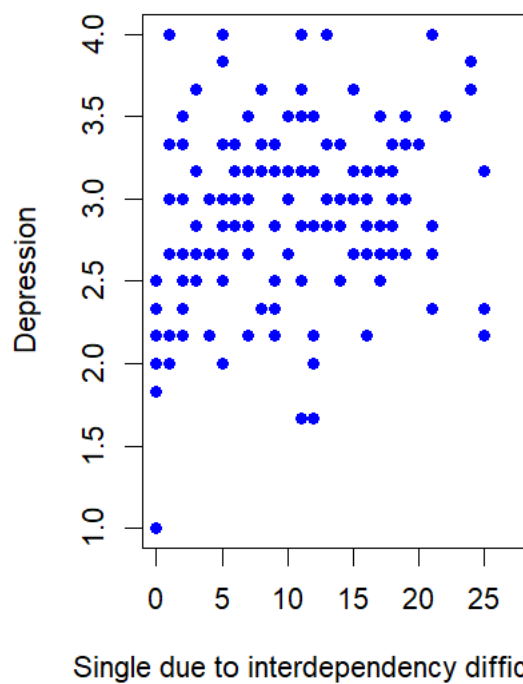
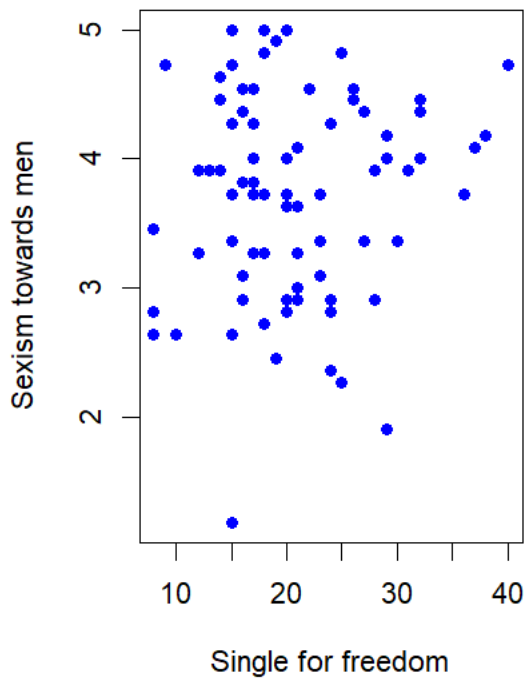
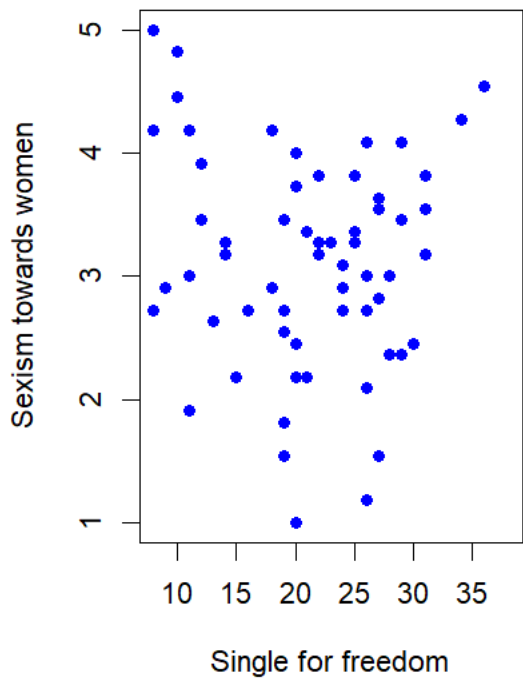


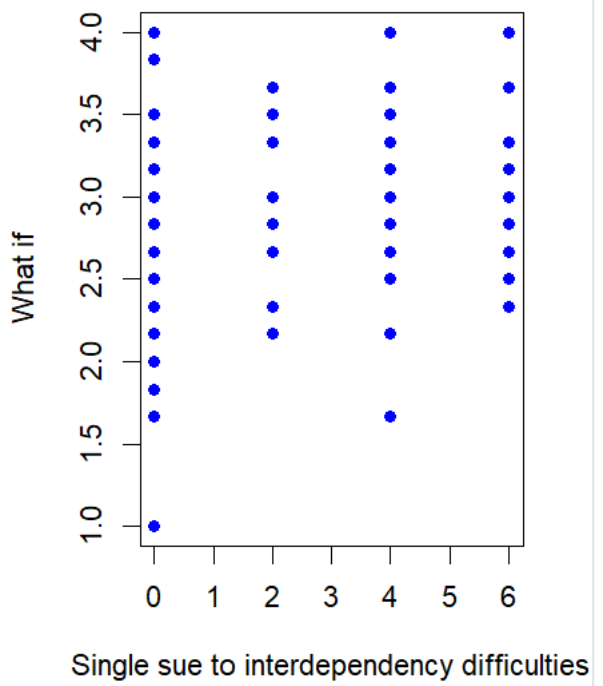
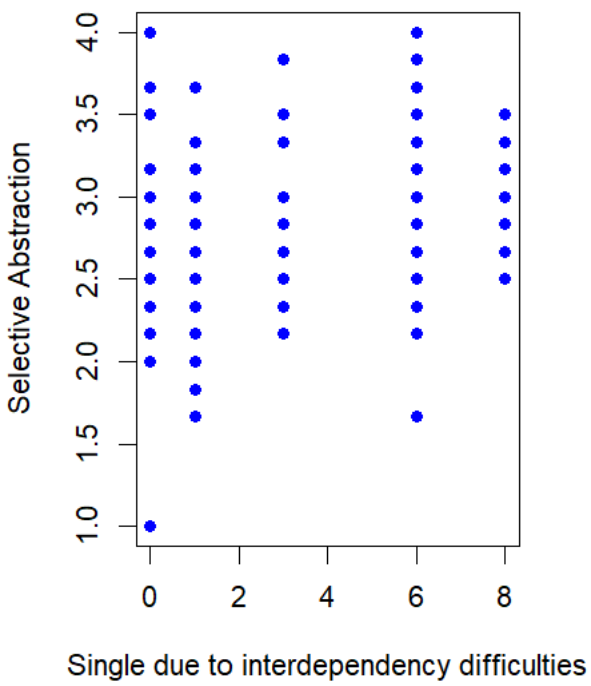
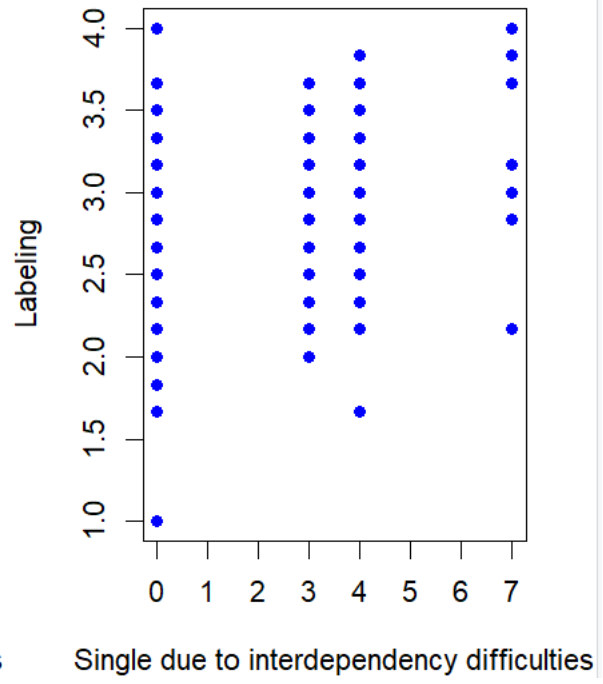
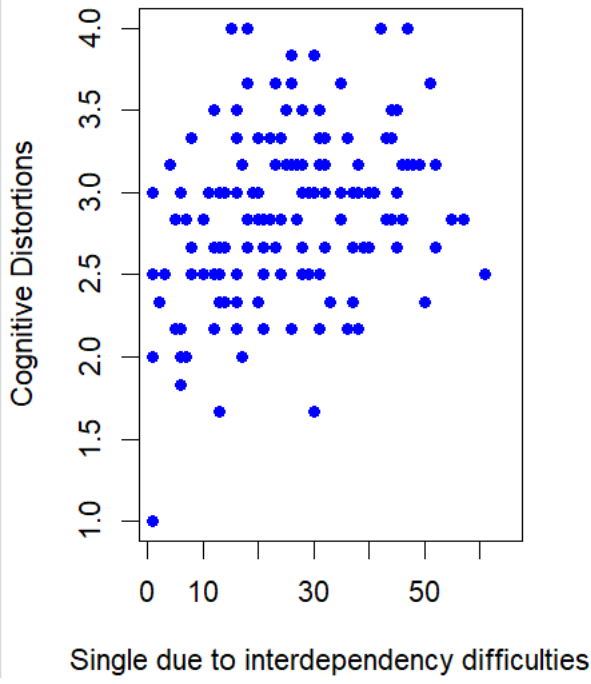


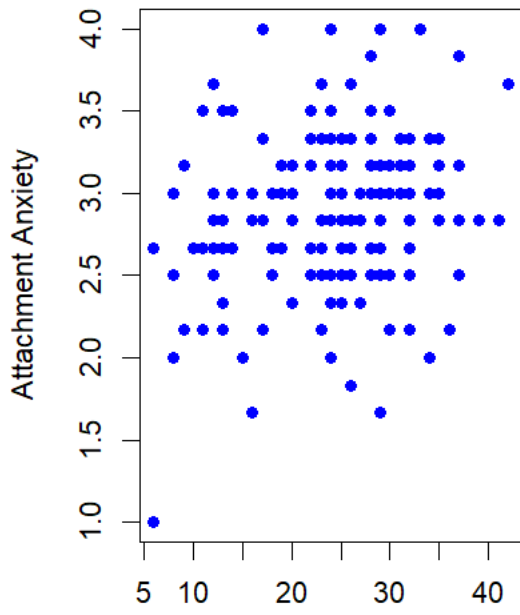




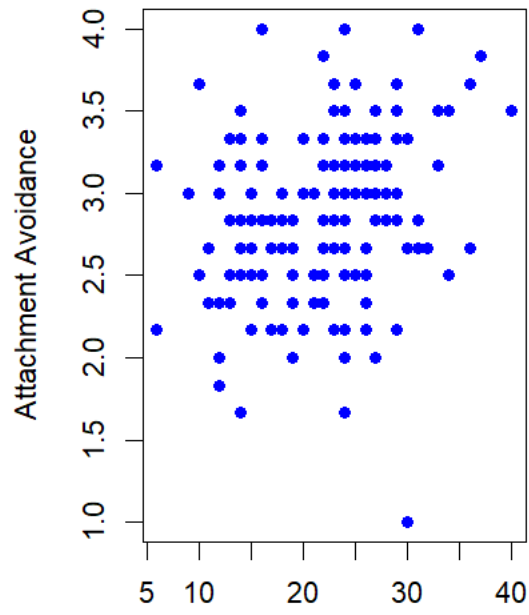




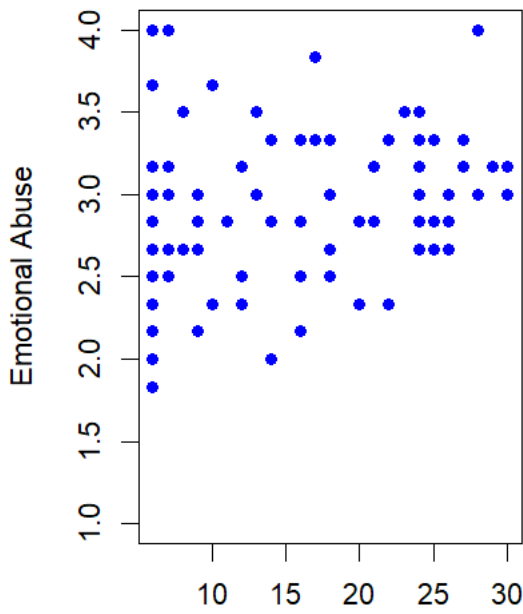




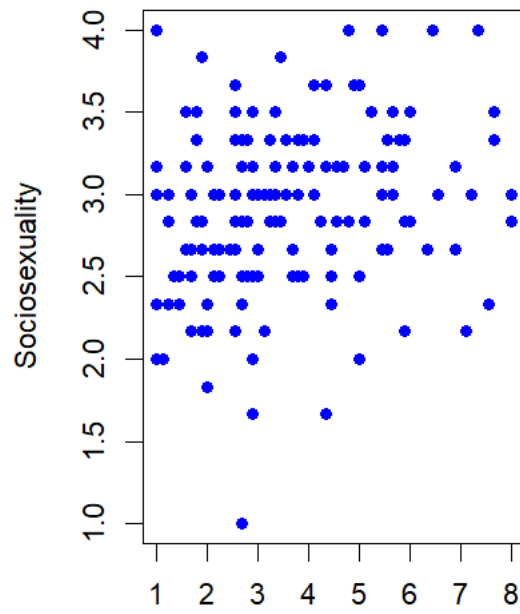
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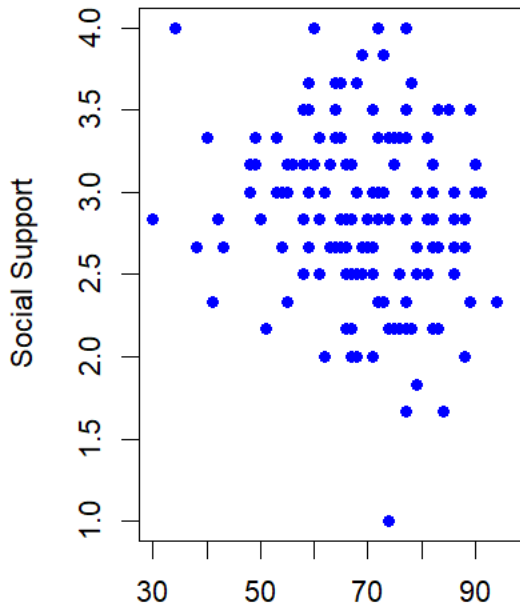
Single due to interdependency difficulties



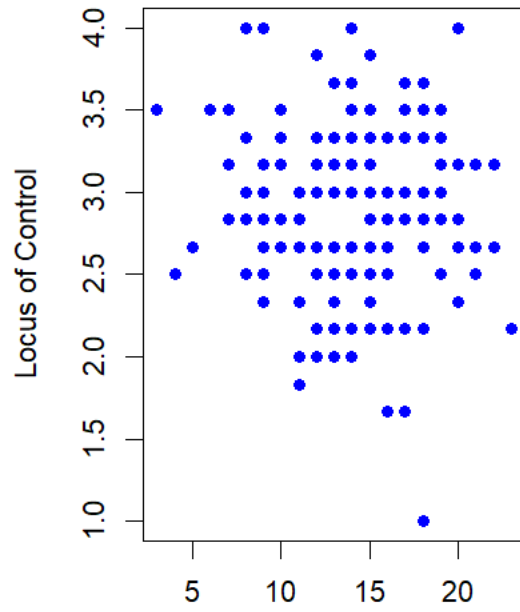
Single due to interdependency difficulties



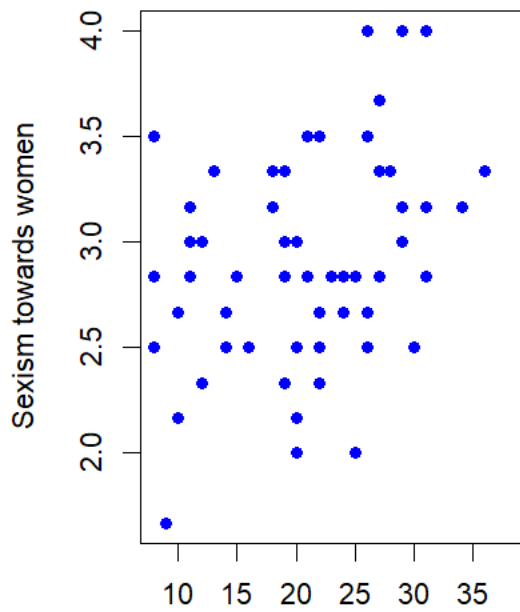
Single due to interdependency difficulties



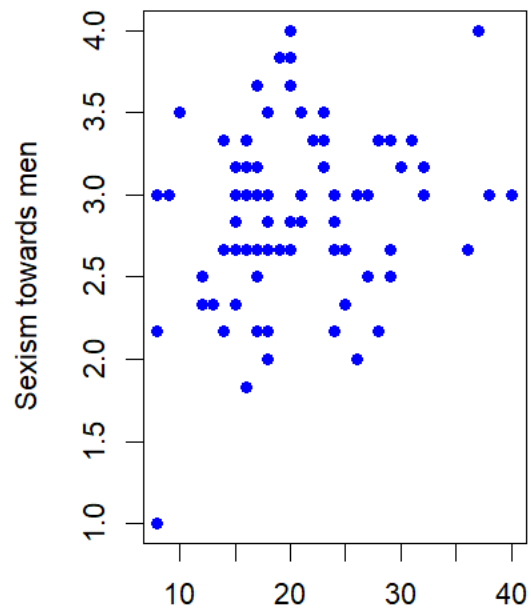
Single due to interdependency difficulties



Single due to interdependency difficulties



Single due to interdependency difficulties



Single due to interdependency difficulties

Table 5

Variance Inflation Factors for Regression Model for Depression including Cognitive Distortions

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.84	1.19
Single by choice	.67	1.49
Single for Freedom	.69	1.46
Single due to interdependency difficulties	.86	1.16
Step 2		
Single due to insecurities	.85	1.68
Single by choice	.65	1.54
Single for freedom	.85	1.46
Single due to interdependency difficulties	.69	1.17
Cognitive Distortions	.6	1.66

Table 6

Variance Inflation Factors for Regression Model for Anxiety including Cognitive Distortions

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.84	1.19
Single by choice	.67	1.49
Single for Freedom	.69	1.46

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Single due to interdependency difficulties	.86	1.16
Step 2		
Single due to insecurities	.6	1.68
Single by choice	.65	1.54
Single for freedom	.69	1.46
Single due to interdependency difficulties	.85	1.17
Cognitive Distortions	.6	1.66

Table 7

Variance Inflation Factors for Regression Model for Depression × Social Support

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.75	1.34
Single by choice	.67	1.49
Single for Freedom	.68	1.46
Single due to interdependency difficulties	.86	1.16
Social Support	.86	1.16
Step 2		
Single due to insecurities	.74	1.35

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Single by choice	.65	1.53
Single for freedom	.65	1.53
Single due to interdependency difficulties	.84	1.18
Social Support	.81	1.24
Social Support x Single due to insecurities	.92	1.09
Social Support x Single by Choice	.51	1.96
Social Support x Single for freedom	.49	2.03
Social Support x Single due to interdependency difficulties	.84	1.19

Table 8

Variance Inflation Factors for Regression Model for Anxiety × Social Support

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.75	1.34
Single by choice	.67	1.49
Single for Freedom	.69	1.46

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Single due to interdependency difficulties	.86	1.16
Social Support	.86	1.16
<hr/> Step 2		
Single due to insecurities	.74	1.35
Single by choice	.65	1.53
Single for freedom	.65	1.53
Single due to interdependency difficulties	.84	1.18
Social Support	.81	1.24
Social Support x Single due to insecurities	.92	1.09
Social Support x Single by Choice	.51	1.96
Social Support x Single for freedom	.49	2.03
Social Support x Single due to interdependency difficulties	.84	1.19

Table 9

Variance Inflation Factors for Regression Model for Depression × Locus of Control

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.83	1.21
Single by choice	.67	1.5
Single for Freedom	.69	1.46
Single due to interdependency difficulties	.85	1.18
Locus of Control	.99	1.03
Step 2		
Single due to insecurities	.8	1.5
Single by choice	.65	1.25
Single for freedom	.67	1.53
Single due to interdependency difficulties	.84	1.19
Locus of Control	.93	1.07
Locus of Control x Single due to insecurities	.83	1.21
Locus of Control x Single by Choice	.7	1.42
Locus of Control x Single due to interdependency difficulties	.69	1.46
Locus of Control	.9	1.11

Table 10*Variance Inflation Factors for Regression Model for Anxiety × Locus of Support*

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.83	1.21
Single by choice	.67	1.5
Single for Freedom	.69	1.46
Single due to interdependency difficulties	.85	1.18
Locus of Control	.97	1.03
Step 2		
Single due to insecurities	.8	1.25
Single by choice	.65	1.53
Single for freedom	.67	1.5
Single due to interdependency difficulties	.84	1.2
Locus of Control	.93	1.07
Locus of Control x Single due to insecurities	.83	1.21
Locus of Control x Single by Choice	.7	1.42
Locus of Control x Single due to interdependency difficulties	.69	1.46

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Locus of Control	.9	1.11

Table 11

Variance Inflation Factors for Regression Model for Depression × Social Support in men

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.7	2
Single by choice	.49	1.43
Single for Freedom	.5	2.03
Single due to interdependency difficulties	.91	1.1
Social Support	.71	1.41
Step 2		
Single due to insecurities	.58	1.73
Single by choice	.39	2.59
Single for freedom	.43	2.3
Single due to interdependency difficulties	.78	1.29
Social Support	.32	3.09
Social Support x Single due to insecurities	.9	1.11
Social Support x Single by Choice	.33	3

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Social Support x Single for freedom	.2	4.97
Social Support x Single due to interdependency difficulties	.69	1.44

Table 12

Variance Inflation Factors for Regression Model for Anxiety × Social Support in men

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.7	1.43
Single by choice	.49	2.04
Single for Freedom	.5	2
Single due to interdependency difficulties	.91	1.1
Social Support	.71	1.41
Step 2		
Single due to insecurities	.58	1.73
Single by choice	.39	2.59
Single for freedom	.43	2.3
Single due to interdependency difficulties	.78	1.29
Social Support	.32	3.09

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Social Support x Single due to insecurities	.9	1.11
Social Support x Single by Choice	.33	3
Social Support x Single for freedom	.2	4.97
Social Support x Single due to interdependency difficulties	.69	1.44

Table 13

Variance Inflation Factors for Regression Model for Depression × Social Support in women

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.73	1.38
Single by choice	.85	1.18
Single for Freedom	.83	1.2
Single due to interdependency difficulties	.77	1.3
Social Support	.89	1.12
Step 2		
Single due to insecurities	.72	1.39

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Single by choice	.82	1.22
Single for freedom	.82	1.23
Single due to interdependency difficulties	.73	1.37
Social Support	.66	1.51
Social Support x Single due to insecurities	.75	1.33
Social Support x Single by Choice	.68	1.48
Social Support x Single for freedom	.58	1.71
Social Support x Single due to interdependency difficulties	.73	1.37

Table 14

Variance Inflation Factors for Regression Model for Anxiety × Social Support in women

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.73	1.38
Single by choice	.85	1.18
Single for Freedom	.83	1.2

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Single due to interdependency difficulties	.77	1.3
Social Support	.89	1.12
Step 2		
Single due to insecurities	.72	1.39
Single by choice	.82	1.22
Single for freedom	.82	1.23
Single due to interdependency difficulties	.73	1.37
Social Support	.66	1.51
Social Support x Single due to insecurities	.75	1.33
Social Support x Single by Choice	.68	1.4
Social Support x Single for freedom	.58	1.71
Social Support x Single due to interdependency difficulties	.73	1.37

Table 15

Variance Inflation Factors for Regression Model for Depression × Sexism in men

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.86	.86
Single by choice	.53	.53
Single for Freedom	.54	1.87
Single due to interdependency difficulties	.85	1.17
Sexism	.85	1.17
Step 2		
Single due to insecurities	.78	1.28
Single by choice	.39	2.58
Single for freedom	.5	1.99
Single due to interdependency difficulties	.69	1.45
Sexism	.82	1.22
Sexism x Single due to insecurities	.71	1.41
Sexism x Single by Choice	.31	3.22
Sexism x Single for freedom	.4	2.5
Sexism x Single due to interdependency difficulties	.67	1.5

Table 16

Variance Inflation Factors for Regression Model for Anxiety × Sexism in men

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.86	1.16
Single by choice	.53	1.89
Single for Freedom	.54	1.89
Single due to interdependency difficulties	.85	1.17
Sexism	.85	1.17
Step 2		
Single due to insecurities	.78	1.29
Single by choice	.39	2.58
Single for freedom	.5	1.99
Single due to interdependency difficulties	.69	1.45
Sexism	.82	1.22
Sexism x Single due to insecurities	.71	1.4
Sexism x Single by Choice	.31	3.22
Sexism x Single for freedom	.4	2.5
Sexism x Single due to interdependency difficulties	.67	1.5

Table 17*Variance Inflation Factors for Regression Model for Depression × Sexism in women*

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.68	1.46
Single by choice	.81	1.23
Single for Freedom	.83	1.2
Single due to interdependency difficulties	.76	1.31
Sexism	.8	1.25
Step 2		
Single due to insecurities	.67	1.49
Single by choice	.75	1.34
Single for freedom	.79	1.26
Single due to interdependency difficulties	.72	1.39
Sexism	.59	1.68
Sexism x Single due to insecurities	.4	2.48
Sexism x Single by Choice	.62	1.61
Sexism x Single for freedom	.74	1.36
Sexism x Single due to interdependency difficulties	.49	2.05

Table 18*Variance Inflation Factors for Regression Model for Anxiety × Sexism in women*

<i>Predictor Variable</i>	<i>Tolerance</i>	<i>VIF</i>
Step 1		
Single due to insecurities	.68	1.46
Single by choice	.81	1.23
Single for Freedom	.83	1.2
Single due to interdependency difficulties	.76	1.31
Sexism	.8	1.25
Step 2		
Single due to insecurities	.67	1.49
Single by choice	.75	1.34
Single for freedom	.79	1.26
Single due to interdependency difficulties	.72	1.39
Sexism	.59	1.68
Sexism x Single due to insecurities	.4	2.48
Sexism x Single by Choice	.62	1.61
Sexism x Single for freedom	.74	1.36
Sexism x Single due to interdependency difficulties	.49	2.05

