

Online Infidelity; Gender, narcissism and extraversion as predictors of behaviour and jealousy responses

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1. Abstract

The present study aimed to look at predictors of sexual infidelity online (SIO) and emotional infidelity online (EIO) and also at predictors of jealousy responses towards such behaviours. Gender, narcissism and extraversion were used to do this. A self selecting sample of 173 participants completed questionnaires online about past cheating behaviours, emotional responses to a partner's infidelity (modified Buss et al., 1999)), narcissism (NPI-16) and extraversion (subset from Big 5). A between and within participants observational group differences design and a correlation design were used. Gender and extraversion were found to be predictors of SIO whereas narcissism was found to be a predictor of EIO. No significant gender differences (GD) were found in jealousy responses to SIO or EIO. Females were found to be significantly more jealous towards SIO than EIO whereas males did not differ significantly. No significant correlation was found between jealousy and narcissism or jealousy and extraversion.

2. Introduction

The internet has opened up a new avenue for people to engage in infidelity. This adds another dimension to an already complex behaviour. Research indicates online intimacy and sexual encounters are on the rise and are just as prevalent among those who are married and in serious relationships as those who are single (Daneback, Cooper, & Mansson, 2005; Schwartz & Southern, 2000). Yet, at present very little is known about which factors contribute to online infidelity (OI).

The present study aimed to look at OI from two perspectives. Firstly it aimed to identify possible predictors of SIO and EIO. More specifically, GD which may be contributing to either type of infidelity were assessed, as were the personality traits of narcissism and extraversion. Secondly, these same variables were again used, to try to identify factors which lead to individuals emotional responses, termed as jealousy, in response to a partner's hypothetical online sexual or emotional infidelity. The aim was then to review these findings in line with previous research and theories in both traditional and OI research.

2.1 What is Online Infidelity?

The internet allows people to engage in a plethora of behaviours which are perceived as infidelity and thus has led to a need to expand the definition. While there is no universal definition of what OI is, the most frequently used in the literature is “ a romantic and/or sexual relationship that is initiated via online contact and maintained predominantly through electronic conversations...” (Young, Griffin-Shelley, Cooper, O'Mara, & Buchanan, 2000).

Whitty (2003) compared individual's perceptions of OI with those of offline behaviours and found these behaviours do not fall into a discrete category of their own. OI, like traditional infidelity (TI), seems to be a multifaceted phenomenon that includes both a sexual and an emotional component (Abdi et al., 2012; Henline, Lamke, & Howard, 2007; Whitty, 2003). This finding seems genuine and robust as similar results have been found in qualitative studies using various methods (Henline et al., 2007; Whitty, 2005).

2.2 Theories of Online Infidelity

2.2.1 *Triple "A" Engine.*

Cooper (1998) suggested the triple "A" engine for understanding OI. It identifies three primary factors which can be seen as appealing to individuals participating in OI: accessibility, affordability and anonymity. Accessibility refers to how commonplace and readily available the internet is now. Affordability refers to there being little or no cost to accessing many social networking sites etc. And lastly anonymity refers to how it allows people to remain completely anonymous.

Ross, Manssonm, Daneback and Tikkanen (2005) have suggested a fourth "A" – approximation. This refers to how the internet allows an individual to experiment and engage in behaviours which they might not normally do and that it is a close enough approximation to the real world to allow them to gain satisfaction from it.

2.2.2 “*Ace Model*”

Others such as Young et al in (2000) proposed the ACE model which refers to anonymity, convenience and escape. Anonymity and convenience are similar to the previous model. Escape here refers to how it can allow the individual an easy escape from issues in their “real” relationships.

However, all of the above are limited, as they do not explain the process of how these relationships develop. Consequently then, they are more so frameworks for understanding OI, rather than models which aim to explain its development.

2.3 Gender Differences in Online Sexual and Emotional Infidelity

Research into TI indicates that males are more likely to engage in SIO and females are more likely to engage in EIO (Allen & Baucom, 2004; Blow & Hartnett, 2005; Boekhout, Hendrick, & Hendrick, 2003; Boğda & Şendil, 2012; Glass & Wright, 1992; Lewandowski & Ackerman, 2006)

However, looking at OI research, Wysocki and Childers (2011) found that females aged 30-39 and 40-49 were significantly more likely than males to engage in OI and are turning more and more to the internet to find a sexual partner. Guadagno and Sagarin (2010) also looked at GD in SIO and found that women were marginally more likely than men to engage in cybersex (p.2650).

However, whilst Wysocki and Childers (2011) had over five thousand respondents, they failed to define what they meant by “cheating” or to differentiate between the different components of OI – SIO and EIO. Participants were only asked -“Have you ever cheated online while in a serious relationship with someone in real life?”(p.224). Also Guadagno and Sagarin (2010) only looked at SIO in terms of cybersex. No study thus far has looked specifically at GD in EIO.

2.4 Theories of gender differences in romantic jealousy

Romantic jealousy can be defined as “a fear of losing an important relationship to another person who is viewed as a rival” ((Parrott & Smith, 1993). In TI research robust findings show that males, when compared to females, are more upset by sexual infidelity and females, when compared to males, are more upset by emotional (Buss et al., 1999; Buss, Larsen, Westen, & Semmelroth, 1992; Groothof, Dijkstra, & Barelds, 2009; Harris & Christenfeld, 1996; Henline et al., 2007; Sabini & Green, 2004; Whitty & Quigley, 2008).

2.4.1 *Evolutionary Theory*

Buss, Larsen, Westen and Semmelroth (1992) reported the original GD findings and they proposed it was due to evolved differences. In simple terms, men are assumed to be more jealous of sexual infidelity, due to the increased risk of parental uncertainty and females are assumed to be more jealous of emotional infidelity due to the risk of the partner

withdrawing resources from their offspring. This theory views jealousy as operating as an innate sexually dimorphic module with different triggers for both sexes.

Results consistent with this claim have been found repeatedly and cross culturally (Buss et al., 1999; Sabini & Green, 2004). However, findings supporting this theory has been criticized on many fronts (DeSteno & Salovey, 1996; DeSteno, Bartlett, Salovey, & Braverman, 2002; Harris, 2003; Lishner, Nguyen, Stocks, & Zillmer, 2008; Sabini & Green, 2004). The main criticism has been that GD are a methodological artefact of the forced choice method (FCM) employed in these studies (DeSteno & Salovey, 1996; DeSteno et al. 2002; Harris, 2003). DeSteno et al (2002) found GD when using a FCM but failed to find any using a continuous measure (CM) on the same participants. Additionally, Lishner et al (2008) found that when the FCM was modified to include both forms of infidelity as equally upsetting, GD disappeared.

Other criticisms suggest the measure does not have construct validity as it only looks at how “upset” participants are (DeSteno et al., 2002; Sabini & Green, 2004) and jealousy has been shown to be more complex than this (Parrott & Smith, 1993). Furthermore, in a review of the literature, Sabini and Green (2004) report that only 3 studies which support it have used a non student sample and GD in these have been less significant. Additionally other studies which used a non student sample failed to find any GD (p.1377).

Moreover, studies have mainly focused on relative values (men relative to women) and not absolute values. Harris (2003) in a review of literature found that in over half of the samples emotional infidelity evoked stronger jealousy than sexual in the majority of men

(p.121). Furthermore, other studies have found both genders are more upset by sexual infidelity (DeSteno et al., 2002; Groothof et al., 2009; Sheets & Wolfe, 2001).

2.4.2 Double Shot Theory

DeSteno and Salovey (1996) proposed that GD can be explained by beliefs concerning the covariation of sexual and emotional infidelity. Women, it proposes, select EI as more distressing, as for them to a greater degree than men, it represents both types of infidelity. Whereas men select SI, as for them to a greater degree than women, it represents both types. When reanalyzing Buss et al (1992) data they reported that this variable (which they named DII) explained much of the variance found in the GD.

2.4.3 Social Cognitive Theory

As gender cannot be randomly assigned Harris (2003) argues that others factors such as socialization and learning may be exerting an influence on why GD appear. This theory views jealousy as the result of appraisals that another person poses a threat to one's positive concept of "self" and also threatens what is valuable in the relationship (p.119). People here, regardless of gender, are assumed to make assessments of the threat and these are what give rise to jealousy.

This theory suggests that primary appraisals may be innate (p.120). However, additional appraisals then come into play regarding the impact of the situation on one's own self. This theory then is still consistent with jealousy serving the adaptive function of

protecting a valued relationship but it rejects the narrow context offered by evolutionary theory. Harris (2003) proposes this offers an explanation for within gender and cultural differences in responses (p.120)

2.5 Gender differences in jealousy

Research assessing whether GD found in TI will carry over to OI have been inconclusive. Henline et al (2007) did not find any significant GD in three of the four dilemmas using a modified Buss et al (1999) FCM. However, in further studies, Groothof et al (2009) and Guadagno and Sagarin (2010) did find significant GD in most of the dilemmas presented using a FCM. Also, in looking at within GD, Henline et al (2009) and Guadagno and Sagarin (2010) found the majority of both genders were more upset by EIO than SIO whereas Groothof et al (2009) found the opposite.

As in TI, most of the GD in these studies had been found using a FCM and also when samples consisted of students. As such, similar to research into TI, results may be a methodological artefact of this paradigm and furthermore may not be representative of the general population. Interestingly, Groothof et al (2009) when using a student sample found GD in all four scenarios whereas when using a non student sample significant differences were only found in two of the four scenarios and were less pronounced (p.1125).

Furthermore, Guadagno and Sagarin (2010) used a CM to look at emotions termed as anger, jealous, disgust and hurt. Significant results were only found in one of the four conditions using this measure. However, as alternative words were also used to describe the emotions felt by participants, one cannot differentiate if the lack of GD was due to the measure itself or the use of these alternate emotions. Furthermore, it employed a young student sample who may lack experience of relationships, infidelity and jealousy due to their young age.

2.6 Narcissism and online infidelity Behaviour

Narcissism can be used to define individuals who have “inflated beliefs about their abilities; are self absorbed; have feelings of superiority and grandiosity: who exploit others and have a sense of entitlement”(Campbell & Foster, 2002). As both a clinical and non clinical construct, they share the same qualities, although not necessarily to the same degree.

High levels of narcissism have been associated with a lack of commitment in romantic relationships and narcissists have also been described as “game players” within their relationships. Relationships appeal to the narcissistic nature as they allow for positive attention and sexual satisfaction. However they tend to repel narcissists as usually they demand emotional intimacy (Campbell, 1999; Campbell & Foster, 2002; Campbell, Foster, & Finkel, 2002).

The finding that narcissism is positively associated with TI is robust (Atkins, Baucom, Christensen, & Jean Yi, 2005; Bakhtiyari, 2013; Buss & Shackelford, 1997; Hunyady, Josephs, & Jost, 2008). However, again, research here is lacking in OI. Aviram

and Amichai-Hamburger (2005) found that the manipulation and exhibitionism components of narcissism were positively associated with higher expectations of having an internet relationship. However, the overall score from this variable was not a significant predictor.

Whilst this study certainly contributed to the literature, it did not look at individuals who actually committed OI. It used the “Internet Relationship Expectations Inventory” which comprised of 20 statements describing positive effects of an internet relationship regarding self disclosure, sexual satisfaction and general satisfaction, which participants rated on a likert scale to their agreement. As is well documented in social research, especially on infidelity, there is often a sizable gap between expectations and what people actually do.(Glass & Wright, 1992; Hackathorn, Mattingly, Clark, & Mattingly, 2011; Maykovich, 1976). As the findings in TI are robust, more research into OI is warranted.

2.7 Narcissism and jealousy

Narcissists use romantic relationships in the service of self regulation to preserve feelings of superiority and esteem and as such this may help buffer against such a negative emotion as jealousy (Foster & Campbell, 2005; Rhodewalt & Eddings, 2002). Rhodewalt and Eddings (2002) exposed participants to negative feedback from potential dating partners and found on recall, participants high in narcissism distorted their memories so as to make them more positive.

Moreover, even if those high in narcissism do acknowledge a partner’s infidelity, their diminished caring for partners and lack of commitment to the relationship could infer that they are likely to be less jealous than their less narcissistic counterparts. Powell (2012) did

find this was the case when he conducted an experiment where participants were lead to believe that their partner had engaged in a flirtatious conversation with a stranger. Results indicated that participants low in narcissism reported more feelings of rival jealousy than those high in narcissism.

Overall, there is very limited research to support the association between narcissism and jealousy in reaction to OI. However, Powell (2012) did use the experimental method which allowed for random assignment and thus helps with making causal inferences. However, again this study did not look specifically at jealousy in OI.

2.8 Extraversion and online infidelity behaviour

Individuals with high levels of extraversion can be characterized as “sociable, friendly, impulsive, talkative and person –orientated. Whereas people low on this trait(introverted side of this dimension) are characterized as being “reserved, socially anxious, quiet and unexuberant” (Cervone & Pervin, 2009, p. 248,261)

Schmitt and Shackelford (2008) found in 46 nations across 10 major regions of the world, that extraversion was positively correlated with a lack of relationship exclusivity, an interest in short term mating and having succumbed to short term mate poaching. Moreover, Orzeck and Lung (2005) found that cheaters rated themselves as more extraverted than non cheaters in self ratings on this factor. (p.280).

However, these studies have looked at the association between extraversion and TI and not OI. Furthermore, it seems this trait is most strongly related to engagement in extradyadic sex, which could imply that those higher in extraversion may not be attracted to OI (Schmitt, 2004; Schmitt & Shackelford, 2008). No study so far has looked at whether these findings in TI will carry over to OI.

However, research has looked at extraversion and the formation of online friendships. The majority of studies looking at this have found that those scoring higher on extraversion use the internet more for social interaction. (Gosling, Augustine, Vazire, Holtzman, & Gaddis, 2011; Moody, 2001; Peter, Valkenburg, & Schouten, 2005; Valkenburg & Peter, 2007; Wästlund, Norlander, & Archer, 2001; K. Wilson, Fornasier, & White, 2010). However, building on these findings, Valkenburg and Peter (2007) found that although those less extraverted use the internet less, they use it more for self disclosure than those higher in extraversion. Specifically they found that 36% of less sociable adolescents compared to 23% of more sociable adolescents believed that the internet is more effective than face to face communication to communicate about intimate topics (p.275)

Furthermore, Bargh, McKenna and Fitzsimons (2002) found that individuals who could not express their “true self” in the immediate social environment will use the internet to do so. They created an indicator called the “real me” which refers to the ability to express fully the real self in social situations. Through extensive work they suggested that building close and intimate relationships on the internet is mediated by the location of the “real me” here rather than in the real world. (Bargh et al., 2002; McKenna, Green, & Gleason, 2002). Further research by Amichai-Hamburger, Wainapel, and Fox (2002) found that participants

low in extroversion locate their “real me” on the internet while those higher in this trait locate it in traditional forms of social interaction.

Thus it seems likely that this personality trait may play a different role in TI and OI. However, to date no research has specifically addressed this so this hypothesis remains unanswered. More research is warranted for theoretical and practical reasons.

2.9 Extraversion and jealousy

As already indicated, most studies in relation to jealousy and individual differences have focused on GD. However, with such inconsistent findings, it raises the question as to whether it might be beneficial to consider individual differences which go beyond that of gender. Other studies have looked at how personality traits such as extraversion, may condition the manner in which individuals respond to situations which evoke jealousy (Stanislaw, 2004; Wade and Walsh, 2008).

Wade and Walsh (2008) investigated this by examining how reactions to emotional and sexual infidelity relate to the Big-5 dimensions of personality, including extraversion. They had participants complete the interpersonal adjective scale revised: Big Five Version (IASR-B5) (Trapnell & Wiggins, 1990) and also respond to two hypothetical infidelity scenarios (Wiederman & Kendall, 1999). Using correlations and multiple regression they found that none of these dimensions correlated or predicted the level of upset for either infidelity. However, research by Stanislaw (2004) found that jealousy is conditioned by personality features and specifically that extraverts react towards it with low intensity (p.42).

However, Wade and Walsh's sample only consisted of 76 participants. Edlund and Sagarin (2009) found using such small numbers can lead to a misinterpretation of results. They highlight "the dangers of falling prey to the belief in the law of small numbers" (p.67). Also participants in both studies were students, thus the results may not be representative of the general population. Furthermore, Stanislaw (2004) did not look specifically at romantic jealousy and Wade and Walsh (2008) did not look specifically at OI.

2.10 Rational

Online social interaction is increasing rapidly and as a consequence there is an increased likelihood of OI occurring (Clayton, Nagurney, & Smith, 2013). Many predict OI is likely to escalate in the coming years (Cooper, McLoughlin, & Campbell, 2000; Gwinnell, 2001; Merkle & Richardson, 2000; Schwartz & Southern, 2000; Underwood & Findlay, 2003), with some predicting it will eventually top the list of the most common forms of infidelity (Keen, 2003)

Smith and Duggan(n.d.) found in 2013 that an average of 890 million people actively use Facebook daily. Also chat rooms and dating services such as marriedandflirtingchat.com are now geared specifically at people in relationships. In 2010, Ashley Madison, a site for married people seeking affairs, had over six million members (Wysocki & Childers, 2011, p. 223). Additionally, research indicates that people in committed relationships are just as likely as single participants to engage in cybersex (Daneback et al., 2005; Schwartz & Southern, 2000).

Moreover, a mounting body of evidence suggests that OI is perceived as a real act of betrayal and a real threat to relationships (Abdi et al., 2012; Hertlein & Piercy, 2006; Kuriansky, 1998; Mao & Raguram, 2009; Merkle & Richardson, 2000; Whitty, 2005; Whitty, 2003). These claims have been validated by reports that OI accounts for a growing trend in reasons given for divorce (Atwood, 2005; Clayton et al., 2013; Mileham, 2004). Furthermore, it is a real threat as in many cases individuals will continue these relationships offline (Hardie & Buzwell, 2006; McCown et al., 2001; Underwood & Findlay, 2003; Whitty & Gavin, 2001; Wysocki & Childers, 2011).

In addition, the discovery of infidelity can trigger a broad range of adverse consequences including depression, divorce and suicide (Cooper et al., 2000; Hertlein & Piercy, 2006; Mao & Raguram, 2009; Whitty, 2003). Furthermore, jealousy experienced in response to a partner's infidelity has been linked to spousal abuse and homicide, particularly among men. (Wilson & Daly, 1998). Due to its prospective wide reaching negative effects, identifying any potential factors contributing to it would be beneficial, not only to the individual and their families, but also to society as a whole. However at present research is still in its infancy and more research is warranted to try to understand the underlying processes involved (Merkle & Richardson, 2000; Whitty, 2003; Whitty, 2005; Whitty & Quigley, 2008)

2.11 Aims and Hypothesis

Firstly this study aimed to examine if GD existed in SIO and EIO behaviour and in jealousy responses towards SIO and EIO. It used a more robust measure of OI behaviour than previous research which differentiated between SIO and EIO. The behaviours chosen for this measure were found to be the most frequently encountered behaviours in the literature using projective stories (Whitty, 2005) and open ended questions (Henline et al., 2007). Additionally this study aimed to expand on previous research in OI by using a CM of jealousy and a non student sample. It also aimed to try to identify a possible salient emotion expressed by participants which may be more valid measure of jealousy by asking a qualitative question addressing this.

The following hypotheses were proposed:

- H1-** Females will engage in sexual online infidelity significantly more than males
- H2-** There will be a significant relationship between gender and emotional infidelity online.(due to lack of research, the direction of this relationship is not specified).
- H3-** There will be no significant difference between males and females in their jealousy reactions towards a partner's hypothetical sexual infidelity online
- H4-** There will be no significant difference between males and females in their jealousy reactions towards a partner's hypothetical emotional infidelity online

H5 – Both males and females will be significantly more jealousy towards a partner's hypothetical emotional infidelity online compared to their sexual infidelity online

The second aim was to assess the relationship between narcissism and jealousy and also the difference between those who had cheated online and those who have not on levels of narcissism. No study presently had directly looked at whether narcissism was a predictor of SIO or EIO. The present study aimed to address this gap. Similarly, no study had directly addressed if there was a relationship between narcissism and jealousy in OI. The present study aimed to fill this gap and assessed if findings in TI would carry over to OI.

Hypotheses:

H6- There will be a significant relationship between narcissism and jealousy responses to online infidelity (due to lack of research, the direction of this relationship is not specified and the hypothesis is 2-tailed)

H7- There will be a significant difference between those who have engaged in sexual online infidelity and those who have not on their levels of narcissism.

H8- There will be a significant difference between those who have engaged in emotional online infidelity and those who have not on their levels of narcissism

The third aim of this research was to assess if there was a relationship between extraversion and jealousy towards a partner's OI and also to assess if there was a difference between those who have cheated online and those who have not on their levels of extraversion.

No research to date had looked at whether extraversion could predict OI behaviour. Research looking at general relationships online and extraversion suggest it may play a differing role in OI than TI. The present study aimed to assess this. Regarding the relationship between extraversion and jealousy in OI, this study was the first to address this and assess if findings in TI will carry over to OI.

2.12 Research Hypothesis

- H9-** There will be a significant difference between those who have engaged in sexual online infidelity and those who have not on their levels of extraversion.
- H10-** There will be a significant difference between those who have engaged in emotionally online infidelity and those who have not on their levels of extraversion.
- H11-** There will be a significant relationship between extraversion and jealousy responses towards online infidelity. (The nature of the relationship is not specified due to conflicting findings in the research)

3. Methodology

3.1 Participants

A total of 173 participants (116 females and 57 males) took part. It was calculated that the minimum amount of participants needed if the effect size was estimated at .50 and $\alpha = 0.05$ and power is at 0.85 was 146 (g*power). The overall mean age was 35.69 ($SD= 8.36$) and the age range was 18-64. The mean age for females was 35.39 ($SD=8.14$) and for males was 36.30 ($SD=8.84$). The participants were a non probability self selecting sample. The survey was posted on Facebook and Twitter. The majority of participants who took part in this study were European (90.75%).

3.2 Design

This research was a mixed survey design. It was mainly quantitative but also asked two qualitative questions.

It used a between participants observational group differences design to look at GD in OI behaviour and jealousy responses. This design was also used to look at group differences between those who have cheated sexually online, emotionally online and those who have not on their levels of narcissism and extraversion (Howitt and Crammer,2011, p.12; Coolican,2009, p.111-112). Due to the term “observational” being used as a technique for assessing the dependant variables in true experiments and its use in recording freely produced behaviour in a natural setting, these type of observational studies can also be referred to as “post facto” studies(Sprinthall,2003). This useful distinction simply means “after the fact”

and refers to observing something after it has occurred. Furthermore, a within participants post facto group differences design was used to look at within gender differences in jealousy responses to sexual and emotional infidelity and online cheating behaviour. It used a correlational design to look at the relationship between narcissism and jealousy and extraversion and jealousy.

Below is a specification of the individual predictor (PV) and criterion (CV) variables used.

<u>Hypothesis 1</u>	PV Gender	CV Sexual Online Infidelity
<u>Hypothesis 2</u>	PV Gender	CV Emotional Online Infidelity
<u>Hypothesis 3</u>	PV Gender	CV Sexual Jealousy
<u>Hypothesis 4</u>	PV Gender	CV Emotional Jealousy
<u>Hypothesis 5</u>	PV Gender	CV Emotional/Sexual Infidelity
<u>Hypothesis 6</u>	PV Narcissism	CV Jealousy
<u>Hypotheses 7</u>	PV Narcissism	CV Sexual infidelity online
<u>Hypothesis 8</u>	PV Narcissism	CV Emotional Infidelity Online
<u>Hypothesis 9</u>	PV Extraversion	CV Sexual Infidelity Online
<u>Hypothesis 10</u>	PV Extraversion	CV Emotional Infidelity Online
<u>Hypothesis 11</u>	PV Extraversion	CV Jealousy

3.3 Materials

Each participant completed questionnaires which asked them about their past online cheating behaviour, their emotional responses to a partner's sexual and emotional OI,

narcissism and extraversion. Participants were also asked to complete demographic questions such as gender, age, ethnicity, relationship status and internet use (Appendix 1).

3.3.1 Cheating Behaviour Online

In order to measure participant's cheating behaviour online, a simple FCM was used. Participants were asked to indicate, by selecting either "yes" or "no" if they had ever had (i) cybersex (ii) hot chatted (iii) formed a deep emotional bond online or (iv) fallen in love online, whilst in a committed relationship. Cyber sex was operationally defined as "obtaining sexual gratification whilst interacting with another person online" (Whitty, 2003). Hot chatting was defined as "online socializing which has moved beyond light hearted flirting" (Cooper, Delmonico and Burg, 2000).

Wysocki and Childers (2011) and Guadagno and Sagarin (2010) used similar forced choice questions to assess participants cheating behaviour online. The answers were then broken down into sub scales. The answers given for "hot chatting" and cybersex" became "sexual infidelity online (SIO)" and the answers given for "formed a deep emotional bond online" and "fallen in love online" became "emotional infidelity online (EIO)". For SIO participants were labelled as 1=none of these behaviours, 2= hot chatting 3= cybersex 4=both behaviours. This allowed the creation of mutually exclusive categories. For EIO participants were labelled as 1= none of these behaviours 2= deep emotional bond 3= fallen in love and 4=both of these behaviours.

If participants answered "Yes" to any of the cheating questions they were then also asked to "briefly indicate what was your main reason for carrying out the behaviour?"

3.3.2 Jealousy towards sexual and emotional online infidelity

In order to measure jealousy towards SIO and EIO a modified version of the Buss et al (1999) measure was used. It was modified by changing the wording to suit OI and from a forced choice to a continuous measure. Henline et al (2007) had already changed the original wording to suit OI and other studies had modified the original Buss et al (1992) forced choice into a continuous measure (DeSteno et al., 2002; Edlund & Sagarin, 2009; Guadagno & Sagarin, 2010; Sabini & Green, 2004). Participants were asked to read the following scenario:

“Think of a committed, romantic relationship that you had in the past, that you currently have or that you would like to have. Imagine that you discover that the person with whom you’ve been seriously involved became interested in someone whom he or she had met online.”

There were a total of eight statements given. Of the first six statements, three related to a partner’s SIO and three to a partner’s EIO. Participants had to rate how upset/distressed they were on a 7 point scale from 1 being not at all upset/ distressed to 7 being extremely upset/distressed. Only end points were labelled. An example of a statement relating to EIO was “If your partner was forming a deep emotional bond online with that other person”. An example of a statement relating to SIO was “If your partner was enjoying online sex with that other person”.

Scores were then separated into sub scales for participant’s level of upset/distress in response to either a partner’s sexual or emotional infidelities. These scores were then totalled and a higher score indicated a higher level of upset/distress in each sub scale. The overall

scores were also totalled and a higher score indicated a higher level of overall upset/distress.

In relation to internal reliability, a Cronbach's alpha was run for this study and revealed internal consistency for the sexual sub scales as .97 and for the emotional as .94.

For the last two questions participants had to rate on a 7 point scale whether they agreed with the statement from "1 strongly agree to 7 strong disagree". Only end points were labelled. The statements were as follows:

- (i) My partner has become both sexually and emotionally involved with this other person online. I would be more upset/distressed by the sexual infidelity than the emotionally infidelity
- (ii) My partner has become both sexually and emotionally involved with this other person online, I would be more upset/distressed by the emotionally infidelity than the sexual infidelity

These statements were taken separately to assess if conditional probabilities may have influenced the former statements, in line with the double shot hypothesis. As both sexual and emotional infidelity had taken place in the above questions, the probability of one infidelity inferring another was rendered indifferent. Thus if participants were basing their answers to the previous statements (1-6) only on the stated infidelity(sexual or emotional) and not the probability of it implying both, the type of infidelity chosen above as most upsetting/distressing should correspond to which type of infidelity was most upsetting in the first six questions.

In addition, a qualitative question was asked to assess which emotion would best describe how one would feel if their partner cheated online. It read as follows "Imagine, if

someone you were in a committed relationship with, was unfaithful. Give one word to describe how you would feel about your partner's behaviour?"

3.3.3 Narcissism

Adapted from the 40 item Narcissistic Personality Inventory ((Raskin & Terry, 1988) the 16 item NPI-16 was used to assess narcissism. Participants were given 16 pairs of statements and asked to choose the one which came closest to describing their beliefs and feelings about themselves. Out of the pairs of statements, only one answer in each pair was consistent with narcissism. A sample pair of statements was "I try not to show off" and "I am apt to show off if I get the chance". The latter statement here is consistent with narcissism. Out of the 16 statements the proportion of responses consistent with narcissism were totalled. The minimum score was 0 and maximum was 16. The higher the score obtained, the higher the level of narcissism of that participant.

Research indicates that this measure is a satisfactory measure of narcissism when situations do not allow for the use of longer inventories. Furthermore, Ames, Rose and Anderson (2006) carried out five studies which found the NPI-16 to have face, internal, discriminant and predictive validity. However, it is important to note, a Cronbach's alpha ran by the researcher, revealed internal reliability to be low at .657 in the present study.

3.3.4. Extraversion

Extraversion was measured by taking a subset of 8 statements from the Big Five Inventory Questionnaire (Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008). Participants were asked to choose a number from 1-5 to indicate the extent to which they agreed or disagreed that given characteristics applied to

them. The scale went from 1 strongly disagree to 5 strongly agree. A sample statement used was “I am someone who is talkative”. There were three statements which were negatively worded and these had to be recoded. An example was “I am reserved”. For these questions, answers were recoded so that a 5 became a 1, a 4 became a 2, 3 remained as 3, 2 became 4 and 1 became 5. After reverse scoring, the total scores were added to get the overall extraversion score. The higher the score on this measure, the higher the level of extraversion participants indicated.

Research has found the BFI to have external reliability, with three month test-retest reliabilities ranging from .80 to .90 (John & Srivastava, 1999; Rammstedt & John, 2007; Rammstedt & John, 2005). Furthermore, this subset has internal reliability – a Cronbach’s alpha was ran for this study and found internal consistency of .86. Empirical evidence has also found this measure to have convergent validity with other measures (Costa & McCrae, 1992; Goldberg, 1990; John & Srivastava, 1999; McCrae & Costa, 1987; Trapnell & Wiggins, 1990). John et al (2008) found extraversion to have a mean validity score of .95 across three instruments (p.132). They also analyzed self reports and ratings by peers and found validity correlations of .67 for extraversion (p.130).

3.3.5 Apparatus:

SPSS statistical analysis software (version 22) was used and a PC

3.4 Procedure

The present survey contained an introduction page, demographic questions, two qualitative questions and four questionnaires. It was created online using google forms and was posted on the researchers Facebook and Twitter page with a comment asking people to

please complete the survey and share it on their social media pages. Furthermore, whilst piloting the survey, it was discovered that if a mobile phone was used to complete the survey, one had to scroll across on the jealousy questionnaire to see all 7 options on the likert scale. Participants were made aware of this in the Facebook comment, on the introduction page and also at the beginning of the jealousy questionnaire.

The title given to the online survey was “Online Infidelity- Attitudes and Behaviours”. In the introduction page participants were advised the purpose of the study was to look at predicting why people are unfaithful online and also looking at peoples emotional responses to OI. The introduction page also guaranteed anonymity and confidentiality and a confirmation of the right to withdraw at any stage. It was also advised for ethical reasons people under 18 years could not partake. Furthermore it confirmed the survey had gained ethical approval from the Psychology Ethics committee, a sub -committee of the DBS human resources ethical committee and gave corresponding contact details.

The questionnaires were given titles of –Past Behaviours, Attitudes towards Online Infidelity, Personality Questionnaire 1 and Personality Questionnaire 2. This was done so as to avoid the Hawthorn affect. On the final page participants were given contact information for the researcher should they require any further information. They were also given support numbers in the case of any distress caused (Appendix 1)

All 173 responses were transferred to an excel data sheet and answers to demographic and force choice questions were replaced with values. e.g female =1 male =2/ yes=1 no=2. From here data was transferred into SPSS (version 22). The answers were then appropriately recoded as required.

4.0 Results

4.1 Descriptive Results

Descriptive statistics were run on demographic variables and are presented in table 1. Male and female sub categories were created as GD was a major focus in the present research. Of all participants 71% were in a relationship and the remainder were either single (24.9%) or divorced, widowed or separated (4.1%). Furthermore, the majority of participants were European (90%)

Of all participants 23.12% had cheated sexually online (14.5% hot chatted, 2.3% had cybersex and 6.4% had done both) and a total of 9.2% had cheated emotionally (6.9% formed a deep bond and 2.3% had formed a deep bond and fallen in love). Females were more likely to engage in cybersex than men (2.6% versus 1.8%). However, overall, 33.3% of men engaged in SIO and only 18.1% of females did. Also, in all EIO categories females cheated more than males. Overall, 10.4% of females and 7.1% of males cheated emotionally online. See table 2 for a further breakdown.

Table 1: *Demographic variables summary*

Variable	Males		Females		Totals	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Age						
18-30	18	31.6	42	36.2	60	34.7
31-43	26	45.6	52	44.8	78	45.1
44-56	12	21.1	22	19.0	34	19.7
57-68	1	1.8	0	0	1	0.6
Relationship Status						
Married	14	24.6	39	33.6	53	30.6
In a serious Relationship	18	31.6	39	33.6	57	32.9
Dating	5	8.8	8	6.9	13	7.5
Single	19	33.3	24	20.7	43	24.9
Other	1	1.7	6	5.2	6	4.1
Internet Use						
1-5 hours	40	70.2	89	76.7	129	74.6
6-10 hours	11	19.3	19	16.4	30	17.3
11-15 hours	4	7.0	7	6.0	11	6.4
16 or more	2	3.5	1	.9	3	1.7
Ethnicity						
European	53	93	104	89.7	157	90.8
Other	4	7.0	12	10.3	16	19.2

Table 2: *Sexual and emotional online infidelity –frequency and percentages for males, females and total for both genders*

Variables	Males		Females		Totals	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Sexual Infidelity						
Cybersex	1	1.8	3	2.6	4	2.3
Hot Chatting	9	15.8	16	13.8	25	14.5
Cybersex & Hot Chatting	9	15.8	2	1.7	11	6.4
Total Sexual Infidelity	19	33.3	21	18.1	40	23.2
No Sexual Infidelity	38	66.7	95	81.9	133	76.8
Emotional Infidelity						
Deep Emotional Bond	3	5.3	9	7.8	12	6.9
Fallen in love	0	0	0	0	0	0
Deep Bond & Fallen In Love	1	1.8	3	2.5	4	2.3
Total Emotional	4	7.1	12	10.3	16	9.2
No Emotional Infidelity	53	92.9	104	89.7	157	90.8

The mean, median, standard deviation and interquartile range for all variables are shown in table 3. These are given separately for males and females and the total of each is also given. These measures were used as a Shapiro –Wilks test revealed all data was not normally distributed. Also analysis revealed data for narcissism and jealousy were highly skewed and outliers were found for narcissism, As such the interquartile range and median were included as these may give a better representation of these data.

Table 3: Central tendencies and dispersions for males, females and all participants on narcissism, extraversion, total jealousy and sexual and emotional jealousy

Variable	Males				Females				Totals			
	Inter Range*	Median	Mean	SD	Inter Range*	Median	Mean	SD	Inter Range*	Median	Mean	SD
Extraversion	9	24	23.74	6.59	10	24	23.09	6.64	9	24	23.30	6.61
Narcissism	4.5	3	3.49	2.90	3	2	2.53	2.13	3	2	2.85	2.44
Sexual Jealousy	9	20	17.19	4.82	9	19	16.04	5.38	9	19	16.42	5.22
Emotional Jealousy	9	19	16.63	4.64	9.5	18	15.76	5.00	9	18	16.05	4.89
Total Jealousy	14	37	33.82	9.14	17	37	31.80	10.21	17	37	32.47	9.90
Sexual v Emotional**	2.5	4	3.98	1.92	2	4	4.05	1.87	2	4	4.03	1.85
Emotional v Sexual ***	3	4	4.19	1.96	2	4	4.47	1.80	3	4	4.38	1.85

*Interquartile Range. ** Question 7 on jealousy measure. Both sexual and emotional infidelity has occurred. More upset by sexual than emotional. *** Question 8 on jealousy measure. Both sexual and emotional infidelity has occurred. More upset by emotional than sexual

4.2 Inferential Statistics:

Hypothesis 1: Females will engage in SIO significantly more than males.

SIO in the study was defined as having cybersex and/or hot chatting. To create mutually exclusive categories participants were put into categories labelled (i) no sexual infidelity, (ii) cybersex, (iii) hot chatting and (iv) both cybersex and hot chatting. However on running a contingency table it was found that more than 20% of the cells had an expected frequency less than 5. As such, the latter three categories were combined to produce a category called SIO.

Analysis also showed that 33.3% of males engaged in SIO compared to 18.1% of females, see Figure 1 below. A Chi-Square was run to explore if this difference was significant and to check the effect size. It found there was a weak positive significant difference between gender and SIO ($\chi^2(1, N=173) = 4.99$ $p = .026$). Contrary to the hypothesis, males engaged in SIO significantly more often than females therefore the experimental and null hypothesis are rejected.

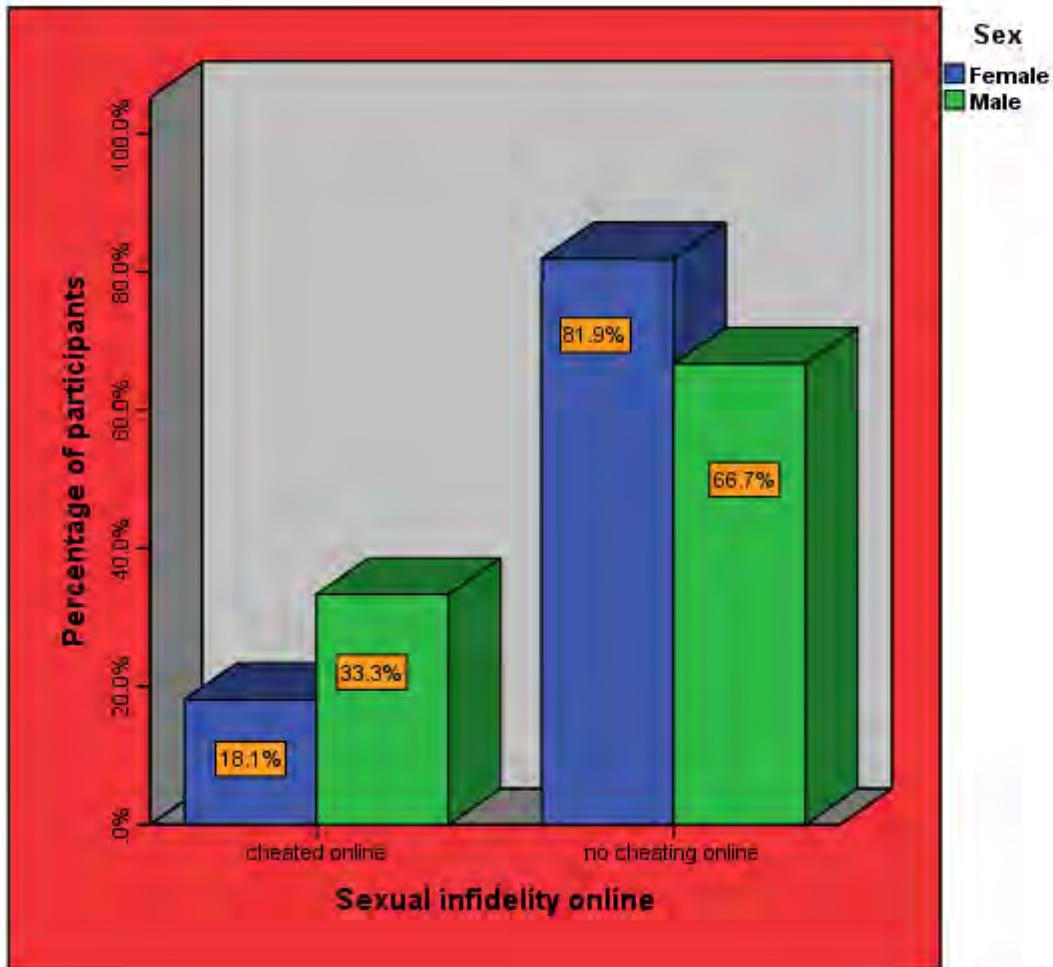


Figure 1. *Gender differences in sexual infidelity online*

Hypothesis 2: There will be a significant relationship between gender and EIO

Due to the lack of empirical research into the relationship between gender and EIO, the direction in this hypothesis was not specified. Again due to 50% of cells having an expected count of less than 5, the categories were combined to form a category called “EIO”.

A contingency table showed that 10.3% of females compared to 7.1% of males had engaged in EIO. A Chi-square was run to see if this difference was significant. It was found

that this relationship was not significant ($\chi^2 (1, N=173) = .504$ $p = .478$). Therefore, our hypothesis was not supported and the null hypothesis was retained.

Hypothesis 3: There will be no significant difference between males and females in their jealousy reactions towards a partner's hypothetical SIO.

A Shapiro- Wilks test revealed sexual jealousy to be not normally distributed ($p = 0.00$) and it was also found to be highly negatively skewed ($-.688$). This again denotes non normal distribution as it was more than twice the standard error ($.185$). Although variances for both males (23.27) and females (26.46) were within the equal range, a Mann Whitney U test was used due to the other assumptions being violated.

Males had a mean rank of 92.76 , compared to the mean rank of 84.17 for females. Although males had slightly higher levels of jealousy than females, the Mann-Whitney U revealed they did not differ significantly ($z = -1.104$, $p = .231$). Therefore, the experimental hypothesis was supported and the null hypothesis was retained. To check the probability that a type II error may have occurred a post hoc power analysis was conducted and power was found to be at $.54$ (see appendix 2). See discussion for further details on the implications of this finding.

A Mann- Whitney U test was run on the stand alone measure of sexual jealousy (Q7 of measure) to assess if conditional probabilities as implied by the double shot hypothesis may have affected answers. Females now had a mean rank of 87.47 , compared to a mean rank of 86.05 for males. Whilst this does suggest conditional probabilities may have played a part, a Mann- Whitney U test found males and females still did not differ significantly ($z = -.26$, $p = .798$). Therefore the experimental hypothesis was supported and the null retained.

Hypothesis 4: There will be no significant difference between males and females in their jealousy reactions towards a partner's hypothetical online emotional infidelity

A Shapiro-Wilks test revealed emotional jealousy to be not normally distributed ($p = 0.000$) and further analysis revealed it (-0.542) to also be highly negatively skewed. Again this was not normal as it was twice the standard error of skewness ($.185$). Although variances for males (21.52) and females (23.61) were equal, a Mann-Whitney U test was run to test the hypothesis due to the other assumptions being violated.

Males had a mean rank 91.46 , compared to the mean rank of 84.84 for females. The Mann-Whitney U test revealed males and females did not differ significantly ($z = -0.822$, $p = .411$). Therefore, the experimental hypothesis was accepted and the null retained. Post-hoc power was calculated to be low at 0.38 (see appendix 3) and again see discussion for the implications of this.

Again to test if conditional probabilities were contributing to previous jealousy scores, question 8 of the jealousy measure was tested using a Mann-Whitney U test. Females had a mean rank of 89.89 , compared to the mean rank of 81.11 for males. This now suggests females are more jealous than males, which would not support the double shot hypothesis. However, again, a Mann-Whitney U test revealed that males and females did not differ significantly ($z = -1.106$, $p = .269$). Therefore, the experimental hypothesis was accepted and the null retained.

Hypothesis 5: Both males and females will be significantly more jealous towards a partner's hypothetical online emotional infidelity compared to their hypothetical online sexual infidelity.

Due to assumptions of normality, as discussed already, being violated, a Wilcoxon test was run to test the above. A gender balanced sample was randomly generated to test this hypothesis (random.org, 2015) (see appendix 4)

A Wilcoxon test found that there was a statistically significant difference in jealousy responses towards emotional and sexual online infidelities for females ($z = -2.35$, $p = 0.019$). However, contrary to the hypothesis, females were significantly more jealous towards SIO than EIO. As such, while the null could not be retained, the experimental hypothesis was not accepted either.

A wilcoxon test found that there was no statistically significant difference in jealousy responses towards emotional and sexual online infidelities for males ($z = -1.73$, $p = .083$). As such the experimental was rejected and the null retained here. Overall the experimental hypothesis was rejected.

Hypothesis 6: There will be a significant relationship between narcissism and jealousy responses to a partner's online infidelity

A Shapiro- Wilks test revealed narcissism and total jealousy scores were not normally distributed ($p = 0.000$). Further analysis also revealed narcissism to be highly positively skewed (1.002) and total jealousy to be highly negatively skewed (-.634) and platykurtic (-1.072) (see figures 2 &3). To test the statistical significance of the skewness, scores were converted to z scores by dividing the score by the standard error (.185) giving z scores of 5.42 and -3.43. (Howitt & Cramer, 2007, pp. 477–478). These are statistically significant as they are above the minimum value of +/- 1.96 needed to be statistically significant at the 5% level with a two tailed test.

Moreover, a box plot revealed outliers in narcissism scores. Also the variance of populations was not even (5.97 versus 97.91). Due to all of these assumptions of normality been violated, a Spearman's Rho test was used. A scatter gram of the relationship between narcissism and jealousy was firstly examined (figure 4). There was no evidence of a curvilinear relationship.

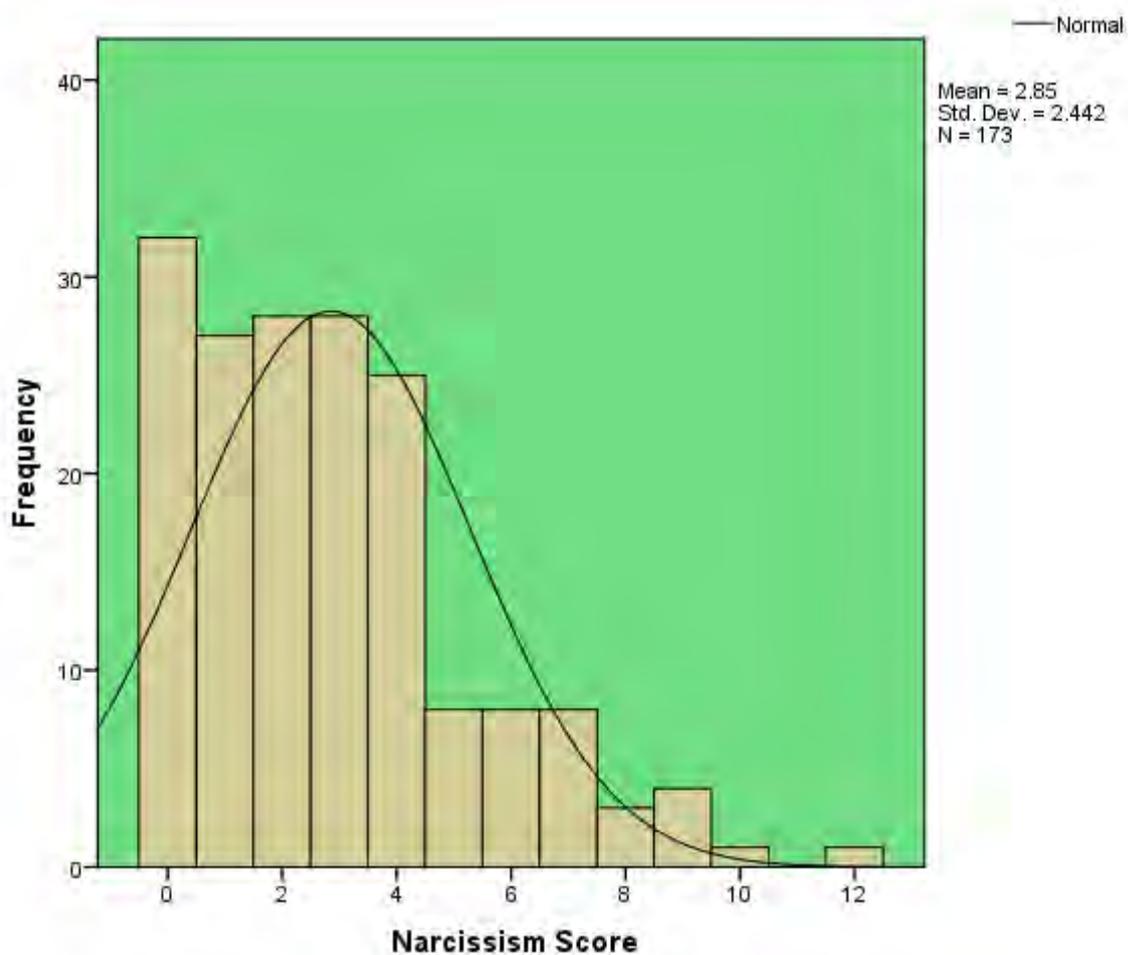


Figure 2 – Histogram showing high positive skew of narcissism scores

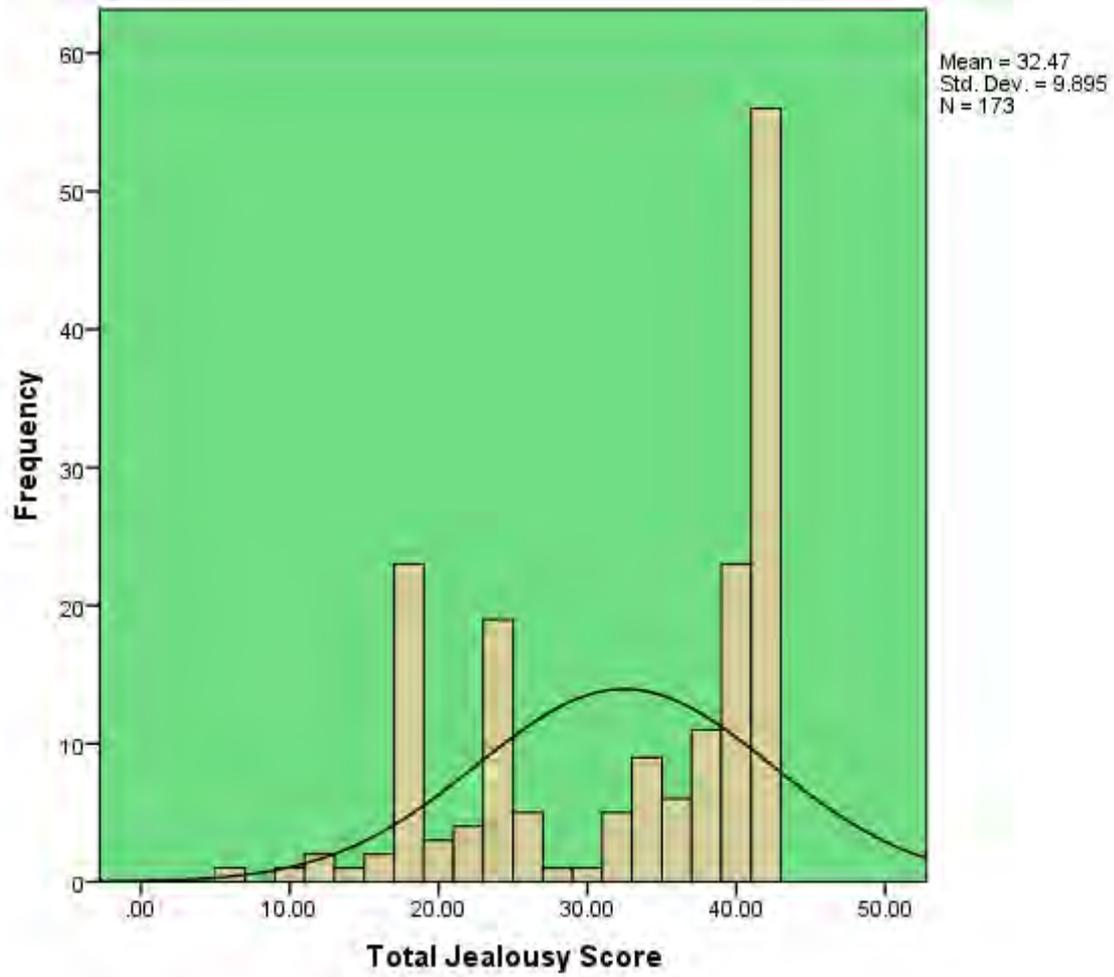


Figure 3 – Histogram showing negative skew and platykurtic jealousy scores

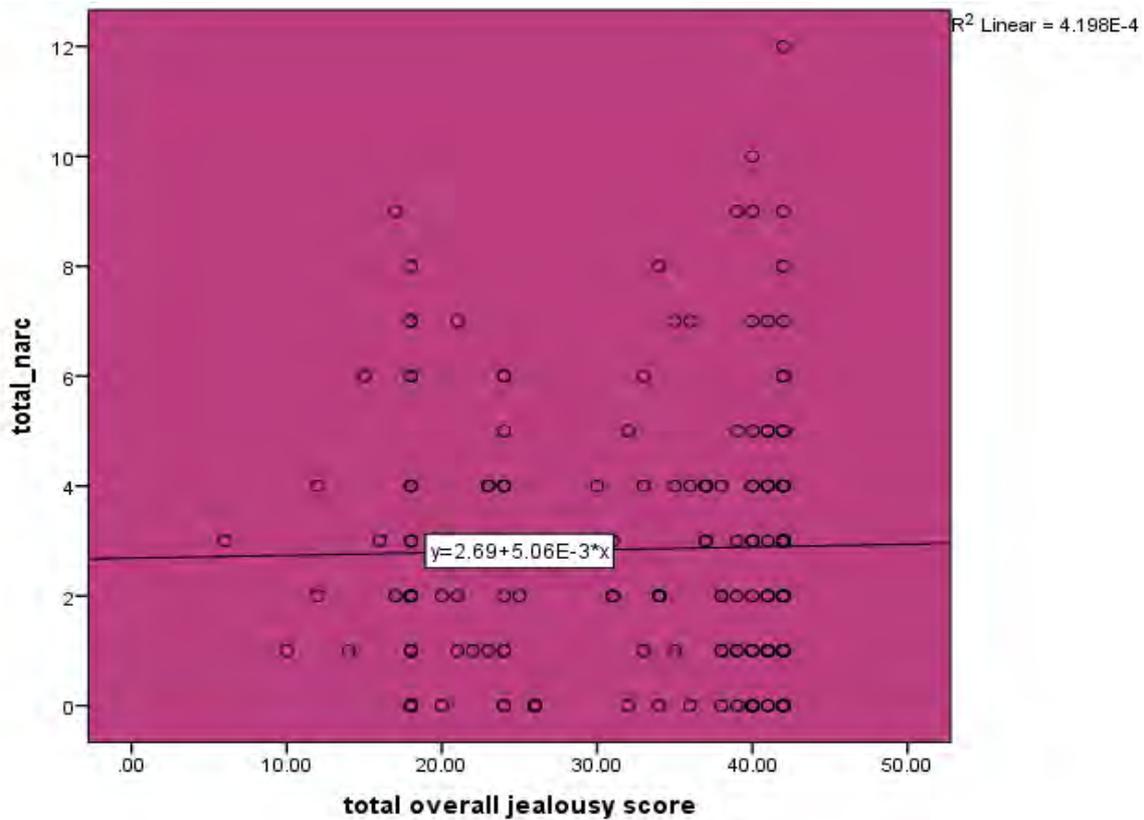


Figure 4 – scatterplot showing relationship between narcissism and jealousy

For a sample of 173, the correlation has to be between -0.20 to -1.00 or + 0.20 to +1.00 to be significant at the 5% level. A Spearman's Rho found that there was no significant relationship between narcissism and jealousy ($\rho(173) = -0.01$, $p = .991$, 2-tailed). They shared no variance as r^2 was 0.00. As such, the experimental hypothesis was rejected and the null hypothesis was retained.

Hypothesis 7: There will be a significant difference between those who have engaged in SOI and who have not on their levels of narcissism.

Again due to the presence of skewness and outliers a Mann-Whitney U test was used to test the hypothesis. Those who had engaged in SOI had a mean rank of 93.93 compared to

a mean rank of 84.92 for those who had not. The Mann-Whitney U test revealed those who engaged in SOI and those who had not did not differ significantly ($Z = -1.008$, $p = .313$, 2-tailed). As such the experimental hypothesis was not supported and the null hypothesis was retained.

Hypothesis 8- There will be a significant difference between those who have engaged in EIO and those who have not on their levels of narcissism.

Again due to non normal data, a Mann- Whitney U test was used. Those who engaged in EIO had a mean rank of 111.75 compared to a mean rank of 84.48 for those who had not. The Mann- Whitney U test revealed those who engaged in EIO and those who had not, differed significantly on their levels of narcissism ($Z = -2.098$, $p = .036$, 2-tailed). As such the experimental hypothesis was accepted and the null rejected.

Hypothesis 9 – There will be a significant difference between those who have engaged in SIO and those who have not on their levels of extraversion

A Shapiro –Wilks test found that extraversion scores were normally distributed ($p = .052$). A box plot revealed no outliers and data was not highly skewed. Due to these factors an Independent samples t-test was used.

The levene's test probability value was not significant (0.185) thus equal variances were assumed. Those who had engaged in SIO (mean = 21.45, SD = 7.07) were found to have lower levels of extraversion than those who had not (mean = 23.86, SD = 6.39). The 95% confidence limits showed that the population mean difference lies somewhere between -4.74 and -0.07. An independent samples t-test found that there was a statistically significant

difference between those who engaged in SIO and those who did not on their levels of extraversion ($t(173) = -2.04, p = .043$)

Hypothesis 10- There will be a significant difference between those who have engaged in EIO and those who have not on their levels of extraversion.

Those who had engaged in EIO (mean = 21.69, SD = 7.40) were found to have lower levels of extraversion than those who had not (mean = 23.46, SD = 6.53). The 95% confidence limit shows that the population mean difference of the variables lies somewhere between -5.20 and 1.65. An independent samples t-test found that there was no statistically significant difference between those who engaged in EIO and those who did not on their levels of extraversion ($t(173) = -1.03, p = .307$)

Hypothesis 11 - There will be a significant relationship between extraversion and jealousy responses towards online infidelity

Analysis revealed that variances between the scores of extraversion (43.71) and jealousy (97.91) were within the equal range. A box plot revealed no outliers on either variable. Firstly; a scatterplot was used to check if there was a relationship between the variables (figure 5). The value of $R^2 = 0.008$. It seemed unlikely there was any relationship between the variables. However, to investigate further a Pearson's correlation coefficient was used. The scatter plot revealed no evidence of a curvilinear relationship.

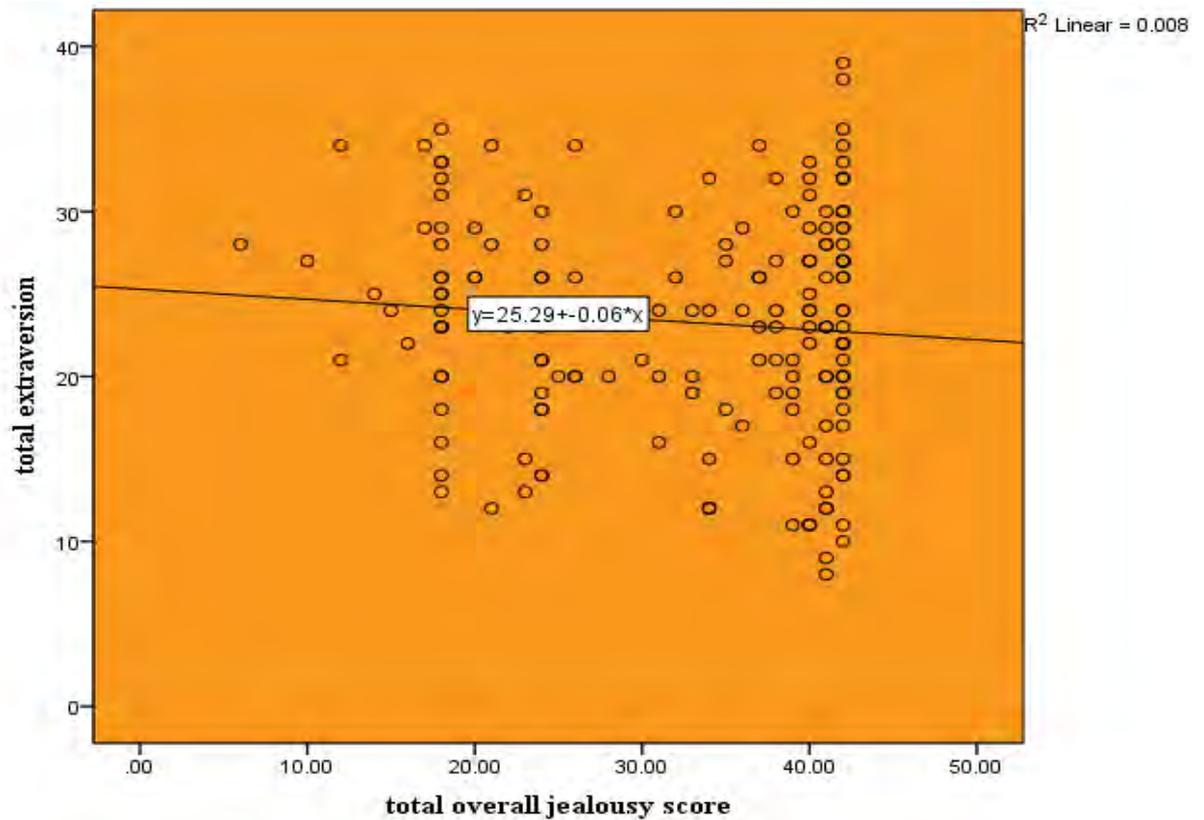


Figure 5 – Scatterplot showing relationship between extraversion and jealousy

The mean score for extraversion was 23.30 (SD = 6.61) and for jealousy was 16.42 (SD = 5.22). A Pearson’s correlation coefficient found that there was no significant relationship between extraversion and jealousy ($r(173) = -.114, p = .137, 2\text{-tailed}$). As such the experimental hypothesis cannot be accepted and the null hypothesis is retained.

Qualitative results

Participants were asked to give one word for how they would feel if their partner’s engaged in OI. The majority of both males (37%) and females (22%) indicated they would feel “betrayed”. This was followed by “devastated” with 17% of females and 9% of males indicating this is how they would feel. Other emotions mentioned were “hurt”, “gutted” “angry”, “heartbroken”, “shocked” and “deceived”.

Participants who had cheated online were asked to indicate why they had done this. The main reason indicated by both genders was relationship problems; “boredom”, “lack of intimacy” and “not sexually fulfilled”. Others liked the “attention” they gained from it, while others did it for “fun” and to “flirt”.

5.0 Discussion

5.1 Findings

The aim of the present research was to look at OI from two perspectives. It aimed to assess if gender, narcissism and extraversion were predictors of SIO and EIO behaviours and also if they predicted jealousy responses towards a partner's infidelity. The aim was then to review the findings in line with previous research and theories in both traditional and OI research.

Briefly, gender and extraversion were found to be predictors of SIO whereas narcissism was not. In terms of EIO, it was the opposite, with narcissism being a predictor whereas gender and extraversion were not. In terms of jealousy responses to SIO and EIO, no significant GD were found. When looking at within gender responses females were found to be significantly more jealous towards sexual than emotional infidelity whereas males did not differ significantly. There was no statistically significant correlation found between jealousy and narcissism or jealousy and extraversion.

The first hypothesis which stated that females would engage in SIO more than males was not supported. This finding was not in line with previous research. This may be due to how studies define SIO. Wysocki and Childers (2011) failed to adequately define what they considered OI to be, whereas Guadagno and Sagarin (2010) only looked at GD in cybersex activities. However, the present study defined SIO as cybersex and/or hot chatting, which was

determined to be a more robust measure. By doing this, the present findings are more in line with findings into TI, where males have consistently been found to engage in SI more than females. (Allen & Baucom, 2004; Blow & Hartnett, 2005; Boekhout et al., 2003; Boğda & Şendil, 2012; Glass & Wright, 1992; Lewandowski & Ackerman, 2006)

The second hypothesis was not supported and there was no relationship found between gender and EIO. This study, to the best of the researcher's knowledge, was the first to look at this relationship, thus it cannot be compared to previous research in this area directly. However, in TI females are consistently found to engage in EIO more than males (Allen & Baucom, 2004; Blow & Hartnett, 2005; Boekhout et al., 2003; Boğda & Şendil, 2012; Glass & Wright, 1992; Lewandowski & Ackerman, 2006). The present findings were in this direction, with females engaging in EIO in all areas more than males (see table 2), although they were not significant.

A possible post hoc explanation could be that the emotional infidelity is taking place in a different context. As theories in OI suggest, the internet offers "anonymity" and "approximation" and possibly males may be more likely to engage in EIO for these reasons. Due to socialization, males may feel less comfortable opening up in traditional settings. The internet allows an individual to experiment and engage in behaviours which they may not normally do. Further research should aim to address this.

Support was found for the third and fourth hypotheses which looked at GD in jealousy towards SIO and EIO. Most significant GD had been found using the FCM and young student samples. Research has suggested that these differences are an artefact of this paradigm and that using students is contributing to these findings (DeSteno & Salovey, 1996; DeSteno,

Bartlett, Salovey, & Braverman, 2002; Harris, 2003). The present study hypothesized that by eliminating both of these possible confounding variables GD would disappear and this was the case.

These results do not support the evolutionary theory. It has been suggested GD may not carry over to OI due to the fact that sexual infidelity cannot lead to pregnancy and as such is not seen as a threat by males. (Guadagno & Sagarin, 2010, p. 2638). However, contrary to this, both males and females showed more upset/distress towards SIO rather than EIO. These findings support DeSteno et al (2002) which found GD which were apparent using the FCM disappeared using a CM and lead to both genders choosing SIO as most upsetting. It is also in line with many other studies (DeSteno et al., 2002; Groothof, 2011; Harris, 2002) . These results also did not support the double shot hypothesis of jealousy.

These findings do support the SCT. This theory seems to be the most parsimonious in explaining why no significant GD were found and also for explaining within gender differences. The present research proposes that the concept of equifinality, which this theory lends itself to, may explain GD in jealousy. This refers to the idea that many different pathways in different individuals are likely to lead to the same outcome.

However, post hoc power was calculated at .54 (H3) and .038 (H4) (appendix 3 &4), and as such a type II error may have occurred and these results could be deemed uninterruptable. However, instead, it is suggested here that they be interpreted with caution. Post hoc power analysis have limited value due to the incorrect assumption that the sample effect size represents the population effect size (Sullivan & Feinn, 2012). Harris (2003) found an estimated overall moderate effect size when the results from 32 samples were combined

(p.103). Furthermore, some of the results here were in direct opposition to the evolutionary and double shot theories.

Hypothesis five which stated that both males and females would be more upset by EIO compared to SIO was not supported and this contradicts the majority of research in this area. Analysis revealed that females were significantly more upset by SIO compared to EIO whereas males did not differ significantly. Again, however, this is consistent with some findings in TI (DeSteno et al., 2002b; Sheets & Wolfe, 2001)

One possible explanation may be the use of young student samples in previous studies. Both studies which found EIO to be most upsetting used a student sample (Guadagno & Sagarin, 2010; Henline et al., 2007). Groothof (2010) used a student and non student sample and found in the older non student sample females were more likely to choose SIO as more upsetting. Alternatively it could be the use of the CM of jealousy, which allows intensity of jealousy to be assessed.

Hypothesis six which suggested a relationship between narcissism and jealousy was not supported. However, this result should be interpreted with caution. A Cronbach's alpha revealed the use of the narcissism scale in this study had low internal reliability (.657). Usually a score above .7 is required for a measure to be considered as having satisfactory reliability.

Hypothesis seven which stated levels of narcissism would be a predictor of SIO was not supported. This result suggests a way in which OI may differ from TI. The finding that narcissism is positively associated with traditional sexual infidelity is robust (Foster, Shrira & Campbell, 2006; Hunyady et al, 2008; McNulty & Widman, 2014). However, no research prior has looked specifically at SIO and narcissism. A possible explanation for this finding could be the lack of actual sexual gratification the narcissist would gain from SIO. However, as previously stated, due to low internal reliability of this measure, these results must be interpreted with caution.

Hypothesis eight which stated that levels of narcissism would be a predictor of EIO was supported. However, whilst the hypothesis was left two tailed, due to the lack of research into EIO, it was implicitly expected that those who engaged in EIO would have lower levels of narcissism than those who did not, as research into TI has found emotional intimacy in relationships tends to repel the narcissist (Campbell & Foster, 2002). Interestingly, the reverse was found in the present research. However, a post hoc analysis revealed that males who engaged in EIO had lower levels of narcissism but females who engaged in EIO had much higher levels of narcissism than those who had not.

Again this finding is illustrative of how TI and OI may differ. A possible explanation could again be the “approximation” and “anonymity” offered online. This could be especially true for females with high levels of narcissism as females are widely cited as needing emotional closeness in interpersonal relationships, yet their narcissistic nature is repelled by it. Alternatively another possible explanation could be it allows them to partake in their noted game playing approach to relationships, allowing them to emotionally manipulate others (Aviram & Amichai-Hamburger, 2005; Campbell et al., 2002).

Hypothesis nine which stated that levels of extraversion would be a predictor of SIO was supported. Those who engaged in SIO had lower levels of extraversion than those who did not. This once again emphasizes how personality seems to play a different role in TI and OI. This is not surprising as the internet contextually is very different from normal social interaction. As social theories suggest the context or environment plus the psychological and biological characteristics of the individual all interact to produce behaviour.

Hypothesis ten which stated that levels of extraversion would predict EIO was not supported. Whilst those who engaged in EIO had lower levels of extraversion than those who had not, the finding was not significant.

Hypothesis eleven which stated that there would be a relationship between extraversion and jealousy to OI was also not supported. This finding supports previous research into jealousy responses to TI and extraversion (Wade & Walsh, 2008). However, as no previous research had looked specifically at extraversion and jealousy towards OI, it cannot be compared to other studies in this specific area.

5.2 Strengths, weaknesses and limitations of the current study

A major strength of this study was the use of a large non student sample. Most studies have used young students, which may not be representative of the population. Firstly, as Harris (2000) noted, they may lack experience with relationships and with issues such as infidelity. Furthermore, research suggests that infidelity concerns may change due to the life stage and reproductive strategies of the individual (Guadagno & Sagarin, 2010; Sabini & Green, 2004). Furthermore, most research into OI has used American samples whereas the

present sample consisted mainly of Europeans. Harris (2003) believes what is perceived by an individual as a personal threat in the form of jealousy can be influenced by culture and what is acceptable.

The present study also used a CM of jealousy. The present findings add credence to the hypothesis that the FCM may be contributing to finding significant GD in OI. This study, to the best of the researcher's knowledge was the first study to use both a non student sample and a CM of jealousy simultaneously in OI research, as such removing both of these variables which research has suggested may be contributing to finding GD in infidelity.(DeSteno & Salovey, 1996; DeSteno et al., 2002; Harris, 2003; Sabini & Green, 2004)

This study also used a more robust measure of OI behaviours than previous studies. Previous studies focused on only one aspect of OI behaviour or failed to adequately define the behaviour.(Guadagno & Sagarin, 2010; Wysocki & Childers, 2011) No study in OI has differentiated between SOI and EOI prior to this study. This was deemed to be important as research has found OI to be a multifaceted phenomenon consisting of both a sexual and emotional component.(Abdi et al., 2012; Henline et al., 2007; Whitty, 2003)

Also, the present study filled some gaps in the OI literature. Research into TI has repeatedly found that personality variables extraversion and narcissism are predictors of infidelity. However, little or no research has addressed these variables in OI. As such the present research added to the body of knowledge available and also allows comparison of findings to those in TI.

However, this study is not without its limitations. As with all studies that contain self report data, there could be concern over the veracity of the responses. This could be especially true with such a sensitive subject as infidelity.

Also while the sample size of 173 was sufficient if the population effect size was estimated as moderate (0.5), the finding that the effect size was small could suggest, if this was taken to represent the actual population effect size, that maybe a larger sample would be needed so as the probability of not making a type two error could be reduced. When the population effect size was estimated as small (0.2), g*power calculated the required sample size to be 900 if power is required at 0.85 (non parametric tests) or 788 if power is at 0.8 (parametric tests).

By assessing how “upset/distressed” participants were, this study carried with it some of the limitations associated with the original Buss et al (1999) measure. Specifically, a concern would be whether this measure has construct validity (DeSteno et al., 2002; Sabini & Green, 2004). Findings here show the majority of participants would feel “betrayed” and “devastated” if a partner engaged in OI. These may be more representative of the emotional responses participants actually have to such infidelities.

Moreover, narcissism had low internal reliability and as such the results from this measure should be interpreted with caution. Also during the pilot study it emerged that all seven points on the scale for the jealousy measure did not automatically show on mobile phones and participants needed to scroll across to see them. While participants were made aware of this, it should still be noted this may have affected some responses.

Also there was an unequal gender balance with 116 females and only 57 males. While originally a gender balanced sample was randomly generated for use in hypothesis 3 and 4, the researcher ultimately decided against this. This would have impacted the power of the study and this was deemed to be more important.

5.3 Future research, implications and applications.

Future research should aim to use a similar CM measure of jealousy as used in this study. However, it is suggested a larger non student sample with approximately equal numbers of both genders be used. Additionally, they could use both a FCM and CM of jealousy, similar to DeSteno et al (2002). Also it is suggested, to increase applicability of these findings, it be replicated using other cultures.

Moreover, while this study used a more robust measure of OI behaviours, as differentiated into SIO and EIO behaviours, future studies could look at these behaviours in different contexts such as on social networking sites, dating sites or in interactive gaming specifically. It is also suggested, due to this studies qualitative findings, that future studies should address the emotions “devastated” and “betrayed” when addressing emotional responses to a partner’s OI.

Future studies should also aim to address personality variables again as at present there is still a glaring lack of research in this area in OI. The present research added to the body of knowledge here but more research is warranted.

This research has theoretical and practical implications. From a theoretical perspective, the present findings add support to the SCT of jealousy. Furthermore, it identified different roles for personality in OI than in TI. This implies that whilst both infidelities are similar in many respects, there may also be different underlying processes contributing to such behaviours. From a practical perspective, the present findings may contribute knowledge to the development of new treatment models which at present are still in their developmental stages (Whitty, 2003)

5.4 Conclusion

The main findings of this study were that OI was found to be similar to TI in that men were found to engage in SIO more than females and although not significant females were found to engage in EIO in all categories more than males. This contradicts other findings in OI but supports the majority of findings in TI.

Another major finding to come from this study was that there was no significant GD found in jealousy scores towards SIO and EIO. Whilst there are mixed findings into GD in OI, this supports findings by Guadagno & Sagarin (2010) who also used a CM measure of OI. Furthermore, this supports the majority of research in TI which used a CM measure of jealousy. The results here would suggest that GD in jealousy towards OI maybe be a methodological artefact of the FCM measure. Alternatively, it could emphasis how both TI and OI differ. However, more research is warranted to establish this. Also, findings suggest personality play's a different role in TI and OI. This emphasizes that although similar in some respects, this infidelity is occurring in a different context and this may allow individuals

participate in behaviour they would not normally. This has important theoretical and practical implications

References

- Abdi, M. R., Nazari, A. M., Mohseni, M., & Zabihzadeh, A. (2012). Internet infidelity: exploration of attitudes towards partners internet behaviors. *Zahedan Journal of Research in Medical Sciences*, *14*(9), 72–75. Retrieved from http://www.zjrms.ir/browse.php?a_code=A-10-905-1&slc_lang=fa&sid=1
- Allen, E. S., & Baucom, D. H. (2004). Adult attachment and patterns of extradyadic involvement. *Family Process*, *43*(4), 467.
- Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality*, *40*(4), 440. <http://doi.org/10.1016/j.jrp.2005.03.002>
- Amichai-Hamburger, Y., Wainapel, G., & Fox, S. (2002). “On the Internet no one knows I’m an introvert”: Extroversion, neuroticism, and internet interaction. *CyberPsychology & Behavior*, *5*(2), 125–128. Retrieved from <http://online.liebertpub.com/doi/abs/10.1089/109493102753770507>
- Atkins, D. C., Baucom, D. H., Christensen, A., & Jean Yi. (2005). Infidelity in couples seeking marital therapy. *Journal of Family Psychology*, *19*(3). Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.141824607&site=eds-live>
- Atwood, J. D. (2005). Cyber-Affairs: “What’s the big deal?” Therapeutic considerations. *Journal of Couple & Relationship Therapy*, *4*(2-3), 117–134. http://doi.org/10.1300/J398v04n02_11

- Aviram, I., & Amichai-Hamburger, Y. (2005). Online infidelity: Aspects of dyadic satisfaction, self-Disclosure, and narcissism. *Journal of Computer-Mediated Communication, 10*(3), 00–00. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2005.tb00249.x/full>
- Bakhtiyari, M. (2013). *Personality factors in infidelity in Iranian American men*. ProQuest Information & Learning, US.
- Bargh, J. A., McKenna, K. Y. A., & Fitzsimons, G. M. (2002). Can you see the real me? Activation and expression of the “true self” on the Internet. *Journal of Social Issues, 1*(1), 33. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.84538314&site=eds-live>
- Benet-Martinez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology, 3*(3), 729. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.21248271&site=eds-live>
- Blow, A. J., & Hartnett, K. (2005). Infidelity in committed relationships II: A substantive review. *Journal of Marital and Family Therapy, 31*(2), 217–233. <http://doi.org/10.1111/j.1752-0606.2005.tb01556.x>
- Boekhout, B. A., Hendrick, S. S., & Hendrick, C. (2003). Exploring infidelity: Developing the relationship issues scale. *Journal of Loss & Trauma, 8*(4), 283–306. <http://doi.org/10.1080/15325020390233093>

- Boğda, D. K., & Şendil, G. (2012). Investigating infidelity tendency and conflict management based on attachment styles and gender. *BAĞLANMA STİLLERİNE VE CİNSİYETE GÖRE ÇATIŞMA YÖNETİMİ VE ALDATMA EĞİLİMİNİN İNCELENMESİ*, 11(40), 205–219.
- Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science (Wiley-Blackwell)*, 3(4), 251–255. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=bth&AN=8559883&site=eds-live>
- Buss, D. M., & Shackelford, T. K. (1997). Susceptibility to infidelity in the first year of marriage. *Journal of Research in Personality*, 31(2), 193–221. <http://doi.org/10.1006/jrpe.1997.2175>
- Buss, D. M., Shackelford, T. K., Kirkpatrick, L. A., Choe, J. C., Lim, H. K., Hasegawa, M., ... Bennett, K. (1999). Jealousy and the nature of beliefs about infidelity: Tests of competing hypotheses about sex differences in the United States, Korea, and Japan. *Personal Relationships*, 6(1), 125–150. <http://doi.org/10.1111/j.1475-6811.1999.tb00215.x>
- Campbell, W. K. (1999). Narcissism and romantic attraction. *Journal of Personality and Social Psychology*, (6), 1254. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.62269434&site=eds-live>

- Campbell, W. K., & Foster, C. A. (2002). Narcissism and commitment in romantic relationships: an investment model analysis. *Personality & Social Psychology Bulletin*, (4), 484.
- Campbell, W. K., Foster, C. A., & Finkel, E. J. (2002). Does self-love lead to love for others? A story of narcissistic game playing. *Journal of Personality and Social Psychology*, (2), 340. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.90097692&site=eds-live>
- Cervone, D., & Pervin, L. A. (2009). *Personality : theory and research*. Hoboken, NJ John Wiley & Sons, Ltd. 2009.
- Clayton, R. B., Nagurney, A., & Smith, J. R. (2013). Cheating, breakup, and divorce: Is Facebook use to blame? *CyberPsychology, Behavior & Social Networking*, 16(10), 717–720. <http://doi.org/10.1089/cyber.2012.0424>
- Cooper, A. (1998). Sexuality and the Internet: Surfing into the new millennium. *CyberPsychology & Behavior*, 1(2), 187–193. <http://doi.org/10.1089/cpb.1998.1.187>
- Cooper, A., McLoughlin, I. P., & Campbell, K. M. (2000). Sexuality in cyberspace: Update for the 21st century. *CyberPsychology & Behavior*, 3(4), 521–536. <http://doi.org/10.1089/109493100420142>
- Costa, J., Paul T., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653–665. [http://doi.org/10.1016/0191-8869\(92\)90236-I](http://doi.org/10.1016/0191-8869(92)90236-I)

- Daneback, K., Cooper, A., & Mansson, S.-A. (2005). An internet study of cybersex participants. *Archives of Sexual Behavior*, (3), 321.
- DeSteno, D. A., & Salovey, P. (1996). Evolutionary origins of sex differences in jealousy? Questioning the "Fitness" of the Model. *Psychological Science*, (6), 367. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custid,cookie,url,athens&custid=s6175963&db=edsjsr&AN=edsjsr.40062982&site=eds-live>
- DeSteno, D., Bartlett, M. Y., Salovey, P., & Braverman, J. (2002). Sex differences in jealousy: evolutionary mechanism or artifact of measurement? *Journal of Personality and Social Psychology*, (5), 1103. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.94121090&site=eds-live>
- Edlund, J. E., & Sagarin, B. J. (2009). Sex differences in jealousy: Misinterpretation of nonsignificant results as refuting the theory. *Personal Relationships*, (1), 67. <http://doi.org/10.1111/j.1475-6811.2009.01210.x>
- Foster, J. D., & Campbell, W. K. (2005). Narcissism and resistance to doubts about romantic partners. *Journal of Research in Personality*, (5), 550. <http://doi.org/10.1016/j.jrp.2004.11.001>
- Foster, J.D., Shrira, I, & Campbell, W.K. (2006). Theoretical models of narcissism, sexuality and relationship commitment. *Journal of social and personal relationships*, 23 (3), 367-386.

- Glass, S. P., & Wright, T. L. (1992). Justifications for extramarital relationships: The association between attitudes, behaviors, and gender. *The Journal of Sex Research*, (3), 361.
- Goldberg, L. R. (1990). An alternative “description of personality”: The Big-Five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216–1229. <http://doi.org/10.1037/0022-3514.59.6.1216>
- Gosling, S. D., Augustine, A. A., Vazire, S., Holtzman, N., & Gaddis, S. (2011). Manifestations of personality in online social networks: self-reported Facebook-related behaviors and observable profile information. *Cyberpsychology, Behavior And Social Networking*, 14(9), 483–488. <http://doi.org/10.1089/cyber.2010.0087>
- Groothof, H. A. K., Dijkstra, P., & Barelds, D. P. H. (2009). Sex differences in jealousy: The case of Internet infidelity. *Journal of Social and Personal Relationships*, 26(8), 1119–1129. <http://doi.org/10.1177/0265407509348003>
- Guadagno, R. E., & Sagarin, B. J. (2010). Sex differences in jealousy: An evolutionary perspective on online infidelity. *Journal of Applied Social Psychology*, 40(10), 2636–2655. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1559-1816.2010.00674.x/full>
- Gwinnell, E. (2001). Risk factors for the development of Internet Adultery. *Journal of Sex Education & Therapy*, 26(1), 45. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=4564701&site=eds-live>

G*Power [computer software]. Retrieved from: http://download.cnet.com/G-Power/3000-2054_4-10647044.html

Hackathorn, J., Mattingly, B. A., Clark, E. M., & Mattingly, M. J. B. (2011). Practicing what you preach: infidelity attitudes as a predictor of fidelity. *Current Psychology*, 30(4), 299–311. <http://doi.org/10.1007/s12144-011-9119-9>

Hardie, E., & Buzwell, S. (2006). Finding love online: The nature and frequency of Australian adults' internet relationships. *Acta Botanica Mexicana*, 1–14. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=23901328&site=eds-live>

Harris, C. R. (2002). Sexual and romantic jealousy in heterosexual and homosexual adults. *Psychological Science*, (1), 7. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsjsr&AN=edsjsr.40063688&site=eds-live>

Harris, C. R. (2003a). A review of sex differences in sexual jealousy, including self-report data, psychophysiological responses, interpersonal violence, and morbid jealousy. *Personality and Social Psychology Review*, 7(2), 102–128. Retrieved from <http://psr.sagepub.com/content/7/2/102.short>

Harris, C. R., & Christenfeld, N. (1996). Jealousy and rational responses to infidelity across gender and culture. *Psychological Science (Wiley-Blackwell)*, 7(6), 378–379. Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=bth&AN=9702216802&site=eds-live>

- Henline, B. H., Lamke, L. K., & Howard, M. D. (2007). Exploring perceptions of online infidelity. *Personal Relationships, 14*(1), 113–128. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-6811.2006.00144.x/full>
- Hertlein, K. M., & Piercy, F. P. (2006). Internet Infidelity: A critical review of the literature. *The Family Journal, 14*(4), 366–371. <http://doi.org/10.1177/1066480706290508>
- Howitt, D., & Cramer, D. (2007). *Introduction to statistics in psychology [eBook]*. Harlow: Pearson Education 2007.
- Hunyady, O., Josephs, L., & Jost, J. T. (2008). Priming the primal scene: Betrayal trauma, narcissism, and attitudes toward sexual infidelity. *Self & Identity, 7*(3), 278–294. <http://doi.org/10.1080/15298860701620227>
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research (3rd ed.)*. (pp. 114–158). New York, NY, US: Guilford Press.
- John, O. P., & Srivastava, S. (1999). The Big Five Trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research (2nd ed.)*. (pp. 102–138). New York, NY, US: Guilford Press.

- Keen, C. (2003). UF study: Online dating virtually irresistible to some married folks.
Retrieved from: <http://news.ufl.edu/archive/2003/07/uf-study-online-dating-virtually-irresistible-to-some-married-folks.html>
- Kuriansky, J. (1998). *The Complete Idiot's Guide to a Healthy Relationship*. New York: Alpha Books.
- Lewandowski, G. W., Jr., & Ackerman, R. A. (2006). Something's missing: need fulfillment and self-expansion as predictors of susceptibility to infidelity. *The Journal of Social Psychology*, (4), 389. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.149500517&site=eds-live>
- Lishner, D. A., Nguyen, S., Stocks, E. L., & Zillmer, E. J. (2008). Are sexual and emotional infidelity equally upsetting to men and women? Making sense of forced-choice responses. *Evolutionary Psychology*, 6(4), 667–675. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=36007227&site=eds-live>
- Mao, A., & Raguram, A. (2009). Online infidelity: The new challenge to marriages. *Indian Journal of Psychiatry*, (4). Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsgao&AN=edsgcl.214179946&site=eds-live>
- Maykovich, M. K. (1976). Attitudes versus behavior in extramarital sexual relations. *Journal of Marriage and Family*, (4), 693. Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsjsr&AN=edsjsr.10.2307.350688&site=eds-live>

McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, (1), 81. Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.6250269&site=eds-live>

McKenna, K. Y. A., Green, A. S., & Gleason, M. E. J. (2002). Relationship formation on the Internet: what's the big attraction? *Journal of Social Issues*, (1), 9. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.84538313&site=eds-live>

McNulty, J.K., & Widman, L. (2014). Sexual narcissism and infidelity in early marriage. *Archives of sexual behaviour*, 43(7), 1315.

Merkle, E. R., & Richardson, R. A. (2000). Digital dating and virtual relating: Conceptualizing computer mediated romantic relationships. *Family Relations: An Interdisciplinary Journal of Applied Family Studies*, 49(2), 187–192.
<http://doi.org/10.1111/j.1741-3729.2000.00187.x>

Mileham, B. L. A. (2004). Cheating by Chatting. *Hispanic*, 17(3), 28–29. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=12404700&site=eds-live>

- Moody, E. J. (2001). Internet use and its relationship to loneliness. *CyberPsychology & Behavior*, 4(3), 393–401. <http://doi.org/10.1089/109493101300210303>
- Orzeck, T., & Lung, E. (2005). Big-Five Personality differences of cheaters and non-cheaters. *Current Psychology*, (4), 274. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.146390288&site=eds-live>
- Parrott, W. G., & Smith, R. H. (1993). Distinguishing the experiences of envy and jealousy. *Journal of Personality and Social Psychology*, (6), 906. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.14111944&site=eds-live>
- Peter, J., Valkenburg, P. M., & Schouten, A. P. (2005). Developing a model of adolescent friendship formation on the internet. *CyberPsychology & Behavior*, 8(5), 423–430. <http://doi.org/10.1089/cpb.2005.8.423>
- Powell, C. A. J. (2012). Superiority of rival, gender, chronic jealousy, and narcissism as predictors of partner-focused versus rival-focused romantic jealousy and aggression. *ProQuest Information & Learning*, US.
- Rammstedt, B., & John, O. P. (2005). Short version of the Big Five Inventory (BFI-K): Development and validation of an economic inventory for assessment of the five factors of personality. *DIAGNOSTICA -GOTTINGEN-*, 51(4), 195–206.
- Random Number Generator. Retrieved from: <https://www.random.org/sequences/>

- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, (1), 203.
- Raskin, R., & Terry, H. (1988). A Principal-components analysis of the narcissistic personality inventory and further evidence of its construct validity. *Journal of Personality & Social Psychology*, 54(5), 890–902. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=sih&AN=16690473&site=eds-live>
- Rhodewalt, F., & Eddings, S. K. (2002). Regular Article: Narcissus reflects: memory distortion in response to ego-relevant feedback among high- and low-narcissistic men. *Journal of Research in Personality*, 36, 97–116. <http://doi.org/10.1006/jrpe.2002.2342>
- Ross, M. W., Månsson, S.-A., Daneback, K., & Tikkanen, R. (2005). Characteristics of men who have sex with men on the internet but identify as heterosexual, compared with heterosexually identified men who have sex with women. *CyberPsychology & Behavior*, 8(2), 131–139. <http://doi.org/10.1089/cpb.2005.8.131>
- Sabini, J., & Green, M. C. (2004). Emotional responses to sexual and emotional infidelity: constants and differences across genders, samples, and methods. *Personality & Social Psychology Bulletin*, (11), 1375.
- Schmitt, D. P. (2004). The Big Five related to risky sexual behaviour across 10 world regions: Differential personality associations of sexual promiscuity and relationship infidelity. *European Journal of Personality*, 18(4), 301–319. <http://doi.org/10.1002/per.520>

- Schmitt, D. P., & Shackelford, T. K. (2008). Big Five Traits related to short-term mating: From personality to promiscuity across 46 nations. *Evolutionary Psychology*, 6(2), 246–282. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=36007190&site=eds-live>
- Schwartz, M. F., & Southern, S. (2000). Compulsive cybersex: The new tea room. *Sexual Addiction & Compulsivity*, 7(1-2), 127–144. <http://doi.org/10.1080/10720160008400211>
- Sheets, V. L., & Wolfe, M. D. (2001). Sexual jealousy in heterosexuals, lesbians, and gays. *Sex Roles*, 44(5-6), 255–276. <http://doi.org/10.1023/A:1010996631863>
- Smith, A., & Duggan, M. (n.d.). Part 3: The Broader online environment around dating and relationships. Retrieved from <http://www.pewinternet.org/2013/10/21/part-3-the-broader-online-environment-around-dating-and-relationships/>
- Sprinthall, R. C. (2003). *Basic statistical analysis / Richard C. Sprinthall*. Boston, Mass. : Allyn and Bacon, 2003.
- Stanislaw, K. (2004). Conditionings of jealousy. *Pedagoga Studies (Pedagogika)*, 75, 40-43. Retrieved from: www.ceeol.com
- Sullivan, G. M., & Feinn, R. (2012). Using effect size—or why the P value Is not enough. *Journal of Graduate Medical Education*, 4(3), 279–282. <http://doi.org/10.4300/JGME-D-12-00156.1>

- Trapnell, P. D., & Wiggins, J. S. (1990). Extension of the interpersonal adjective scales to include the big five dimensions of personality. *Journal of Personality and Social Psychology*, (4), 781. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.9336262&site=eds-live>
- Underwood, H., & Findlay, B. (2003). Internet relationships and their impact on primary relationships. *Australian Journal of Psychology*, 55, 65–66. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=11892973&site=eds-live>
- Valkenburg, P. M., & Peter, J. (2007). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, (2), 267. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.160712567&site=eds-live>
- Wade, T. J., & Walsh, H. (2008). Does the Big-5 relate to jealousy, or infidelity reactions? *Journal of Social, Evolutionary, and Cultural Psychology*, 2(3), 133–143. <http://doi.org/10.1037/h0099349>
- Wästlund, E., Norlander, T., & Archer, T. (2001). Internet blues revisited: Replication and extension of an Internet paradox study. *CyberPsychology & Behavior*, 4(3), 385–391. <http://doi.org/10.1089/109493101300210295>

- Whitty, M., & Gavin, J. (2001). Age/Sex/Location: Uncovering the social cues in the development of online relationships. *CyberPsychology & Behavior*, 4(5), 623–630.
<http://doi.org/10.1089/109493101753235223>
- Whitty, M. T. (2003a). Pushing the wrong buttons: Men's and women's attitudes toward online and offline infidelity. *CyberPsychology & Behavior*, 6(6), 569–579.
<http://doi.org/10.1089/109493103322725342>
- Whitty, M. T. (2005). The Realness of cybercheating: Men's and women's representations of unfaithful internet relationships. *Social Science Computer Review*, 23(1), 57–67.
<http://doi.org/10.1177/0894439304271536>
- Whitty, M. T., & Quigley, L.-L. (2008). Emotional and sexual infidelity offline and in cyberspace. *Journal of Marital and Family Therapy*, 34(4), 461–468. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1752-0606.2008.00088.x/full>
- Wiederman, M. W., & Kendall, E. (1999). Evolution, sex, and jealousy: Investigation with a sample from Sweden. *Evolution and Human Behavior*, 20(2), 121–128.
[http://doi.org/10.1016/S1090-5138\(98\)00046-4](http://doi.org/10.1016/S1090-5138(98)00046-4)
- Wilson, K., Fornasier, S., & White, K. M. (2010). Psychological predictors of young adults' use of social networking sites. *CyberPsychology, Behavior & Social Networking*, 13(2), 173–177. <http://doi.org/10.1089/cyber.2009.0094>
- Wilson, M., & Daly, M. (1998). Lethal and nonlethal violence against wives and the evolutionary psychology of male sexual proprietariness. In R. E. Dobash, R. P.

Dobash, R. E. (Ed) Dobash, & R. P. (Ed) Dobash (Eds.), *Rethinking violence against women*. (pp. 199–230). Thousand Oaks, CA, US: Sage Publications, Inc.

Wysocki, D. K., & Childers, C. D. (2011). “Let my fingers do the talking”: sexting and infidelity in cyberspace. *Sexuality & Culture*, (3), 217. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=edsggo&AN=edsgcl.263034872&site=eds-live>

Young, K. S., Griffin-Shelley, E., Cooper, A., O’Mara, J., & Buchanan, J. (2000). Online infidelity: A new dimension in couple relationships with implications for evaluation and treatment. *Sexual Addiction & Compulsivity*, 7(1/2), 59–74. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,custuid,cookie,url,athens&custid=s6175963&db=a9h&AN=6057571&site=eds-live>

Online Infidelity - Attitudes and Behaviour

Dear Participant

My name is Angela Browne and I am conducting research in the Department of Psychology at Dublin Business School. My research involves looking at predicting why some people are unfaithful online and also looking at peoples emotional responses to online infidelity. This is a relatively new area of research and your participation can greatly help in expanding our knowledge in this area. This research is being conducted as part of my studies and will be submitted for examination.

Participation is voluntary and you are invited to take part. It involves completing all questions. For ethical reasons people 18 years of age or under cannot partake in this survey.

Your participation is completely anonymous and confidential. Thus responses cannot be attributed to any one participant. For this reason it will not be possible to withdraw from participation after the questionnaire has been completed.

This research has been ethically approved by the Psychology Ethics Committee, a sub-committee of the Dublin Business School College Human Research Ethics Committee (contact Dr Patricia Frazer on 01 [redacted]). The researcher supervisor may also be contacted on [redacted].

The risks of this study are minimal. However, due to the sensitive nature of infidelity, if at any stage any uncomfortable feelings arise, you have the right to withdraw before the completion of the study. Furthermore, contact information for support services are included on the final page if this should occur.

In terms of benefits, this research may help to acquire new knowledge in a relatively new area of research and improve our understanding of why these behaviors occur.

Should you require any further information about this research, please see contact details on the final page for myself.

Thank you in advance for taking the time to complete this survey. Your participation is greatly appreciated.

N.B ***Please note: If using a mobile make sure to scroll to the side to view all options from 1-7 as it may seem as if you only have 1-4 options on certain questions.

Angela Browne

* Required

1. Age *

2. Sex *

Mark only one oval.

Male

Female

Demographic Information

3. Relationship Status *

Mark only one oval.

- Single
- Dating
- In a serious relationship
- Married
- Other: _____

4. Do you use the internet?. If so, please indicate below approximately how many hours daily.

Mark only one oval.

- 1-5 hours
- 6-10 hours
- 11-15 hours
- 16 or more

5. Ethnicity *

Mark only one oval.

- European
- American
- African
- Asian
- Other: _____

6. Imagine, if someone you were in a committed relationship with, was unfaithful, give one word to describe how you would feel about your partners behaviour *

Past Behaviours

Please note:

Cybersex is defined as "obtaining sexual gratification whilst interacting with another person online".

Hot Chatting is defined as "socializing online which has moved beyond light hearted flirting"

7. Please indicate below, if while you were in a committed relationship, you have ever taken part in any of the following behaviors, with someone other than your partner? *

Mark only one oval per row.

	Yes	No
Cybersex	<input type="radio"/>	<input type="radio"/>
Hot chatting.	<input type="radio"/>	<input type="radio"/>
Deep emotional bond with someone online	<input type="radio"/>	<input type="radio"/>
Fallen in love online	<input type="radio"/>	<input type="radio"/>

8. If you answered YES to any of the above, please briefly indicate what was your main reason for carrying out the behavior?

Attitudes towards Online Infidelity

Think of a serious committed relationship that you have had in the past, that you currently have, or that you would like to have. Imagine that you discover that the person with whom you've been seriously involved became interested in someone else whom he or she met online. Please choose an option below to indicate the extent to which you would be upset or distressed with each of the following statements

***** N.B -If you are using a mobile phone it is important to either scroll across or to change to the landscape position on your phone as there are 1 to 7 options for your answers although it may initially seem as if there are only 1-3 or 1-4*****

9. If my partner was forming a deep emotional bond online with that other person *

Mark only one oval.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

10. If my partner was enjoying online sex with that other person *

Mark only one oval.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

11. **If my partner was falling in love online with that other person ***

Mark *only one oval*.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

12. **If my partner was having multiple sexual encounters with that other person ***

Mark *only one oval*.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

13. **If online sex occurs between that other person and my partner but specifically no emotional attachment is involved ***

Mark *only one oval*.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

14. **If an emotional attachment occurs between that other person and my partner but specifically no online sex occurs ***

Mark *only one oval*.

	1	2	3	4	5	6	7	
Not at all upset/distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely upset/distressed

15. **My partner has become both sexually and emotionally involved with this other person online. I would be more upset/distressed by the sexual infidelity than the emotional infidelity ***

Mark *only one oval*.

	1	2	3	4	5	6	7	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

Appendix 2

Calculating power for hypothesis 3

Due to sample sizes being unequal, it is required to get the pooled variance for both samples. If an average was taken the SD for females would have an undue influence on the result. As such the pooled variance was found using the following formula $\sigma = \frac{df_1}{df_{total}} s_1^2 + \frac{df_2}{df_{total}} s_2^2$. $115/173 \times 2^2 + 56/173 \times 4.82^2 = 26.775$. To get the SD $= \sqrt{26.775} = 5.17$. Next effect size was calculated using Cohen's d formula $d = \frac{\mu_1 - \mu_2}{\sigma}$. (Alternatively it could be formulated using r^2 for non parametric tests where $r = z / \sqrt{N}$). $D = 16.04 - 17.19 = 1.15 / 5.17 = 0.22$.

Next the formula for power is applied. $\delta = d \sqrt{N/2} = 0.22 \times \sqrt{173/2} = 0.22 \times \sqrt{86.50} = 0.22 \times 9.30 = 2.04$. With α at the $p \leq 0.05$ our value for power is .54

Appendix 3

Calculating power for hypothesis 4

Due to sample sizes being unequal, it is required to get the pooled variance for both samples.

If an average was taken the SD for females would have an undue influence on the result. As

such the pooled variance was found using the following formula $= \sigma = \frac{df_1}{df_{total}} s_1^2 + \frac{df_2}{df_{total}} s_2^2$

$$s_2^2 . 115/173 \times 5.00^2 + 56/173 \times 4.64^2 = 0.665 \times 25 + 0.324 \times 21.53 = 16.625 + 6.976 =$$

23.60. To get the SD = $\sqrt{23.60} = 4.86$ Next effect size was calculated using Cohen's d

formula $d = \frac{\mu_1 - \mu_2}{\sigma}$. (Alternatively it could be formulated using n^2 for non parametric tests

where $r = z / \sqrt{N}$). $d = 16.63 - 15.75 = 0.88 / 4.86 = 0.18$.

Next the formula for power is applied. $\delta = d \sqrt{N/2} = 0.18 \times \sqrt{173/2} = 0.18 \times \sqrt{86.50} = 0.18 \times$

$9.30 = 1.67$. With α at the $p \leq 0.05$ our value for power is .38

Appendix 4

Random Sequence Generator

Here is your sequence:

58	36	28	64	19	75	8	50	96	35
11	9	79	93	83	27	85	12	24	26
99	14	98	86	94	49	34	23	59	33
63	78	22	25	71	53	15	40	6	70
2	31	89	100	69	66	18	77	13	21
42	5	16	68	88	17	84	54	67	55
56	20	10	7	81	74	60	38	51	87
65	47	29	57	37	62	4	1	46	92
90	61	48	3	39	30	91	44	76	45
52	41	73	80	32	72	95	82	43	97

Note: the numbers are generated left to right, across columns

