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Trolling on Tinder® (and other dating apps): Examining the role of the Dark Tetrad and impulsivity

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ABSTRACT

No longer conceptualised as only for the "desperate", online dating offers many benefits over face-to-face dating. Accompanying the benefits of online dating is the potential for new, distinct forms of antisocial behaviour online, such as trolling. The current study ($N = 357$) sought to explore the antisocial behaviour of trolling on Location-Based Real-Time Dating applications (i.e., LBRTD apps) in an online sample of Australians sourced from the community. Specifically, we examined the role of participant's sex and of the personality traits of narcissism, Machiavellianism, psychopathy, sadism, and impulsivity in predicting perpetration of trolling behaviours on LBRTD apps. Although there were no sex differences, the traits of psychopathy, sadism, and dysfunctional impulsivity were significantly associated with trolling behaviours. Subsequent moderation analysis revealed that dysfunctional impulsivity predicts perpetration of trolling, but only if the individual has medium or high levels of trait psychopathy. Results of the current study aid in further conceptualising the personality of the Internet "troll". Future research should further explore antisocial online behaviours, such as other hostile behaviour that occurs on LBRTD apps.

1. Introduction

Online dating is now a popular and socially acceptable way to meet romantic partners (Clemens, Atkin, & Krishnan, 2015). Benefits of online dating are substantial; for example, providing the ability to connect with a wider network of potential suitors (Finkel, Eastwick, Karney, Reis, & Sprecher, 2012) and the opportunity to find a partner who shares similar sexual orientations or religious affiliations (Clemens et al., 2015). Online dating also offers individuals with higher levels of dating and social anxiety the opportunity to engage in social interactions with less discomfort (Aretz, Demuth, Schmidt, & Vierlein, 2010). In addition to traditional online dating sites (e.g., RSVP.com.au®, Match.com®), more recently, mobile phone dating applications "or apps" (e.g., Tinder®, Bumble®) have gained popularity.

Termed Location-Based Real-Time Dating (LBRTD; Stempfhuber & Liegl, 2016) apps, these mobile phone apps focus on enabling local, immediate social (and in some cases, sexual) encounters (Blackwell, Birnholtz, & Abbott, 2014). LBRTD apps differ considerably from traditional online dating sites, which commonly implicitly or explicitly encourage (often through advertising and sometimes through the effort required to create a profile) longer term courtship and online communication (Blackwell et al., 2014). User numbers of traditional online dating sites remain higher than users of LBRTD apps (31% compared to 6% worldwide, respectively; McGrath, 2015), however, LBRTD apps are becoming increasingly popular, especially among younger adults, with 22% of younger adults using these apps (versus 5% reported in 2013; Pew Research Center, 2016). Tinder®, perhaps the most well-known LBRTD app, boasts an impressive 100 million downloads and 10 million active daily users (Smith, 2016). LBRTD apps provide a novel and unique method of establishing interpersonal relationships online and a new frontier for online relationships research. This increase in popularity of using these apps, however, is accompanied by the potential using these apps for antisocial purposes. As such, the aim of the current study was to explore, for the first time, the occurrence of antisocial behaviour on LBRTD apps and the predictors of these behaviours. Specifically, the current study sought to explore the online antisocial behaviour of "trolling".

Internet communication has positive outcomes for interpersonal interactions (e.g., Antoci, Sabatini, & Sodini, 2015) and psychological wellbeing (e.g., Grieve, Indian, Witteveen, Tolan, & Marrington, 2013). Despite this, researchers have identified various social issues that appear more prevalent with Internet communication compared to traditional face-to-face communications (Appel, Gerlach, & Crusius, 2016), with particular attention given to new and diverse antisocial behaviours

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which have emerged online (e.g., Craker & March, 2016). Such antisocial behaviours include sending hate mail, sending threats, spreading rumours, and harassment (Dehue, 2013). A particular online antisocial behaviour that has become increasingly more common in recent years is the behaviour of trolling (Buckels, Trapnell, & Paulhus, 2014).

In general, trolling can be defined as communication online with intention of being provocative, offensive, or menacing (Bishop, 2014), in an attempt to trigger conflict and cause victims distress for the trolls own amusement (Buckels, Trapnell, & Paulhus, 2014). Four elements are considered common in trolling behaviour: Deception, aggression, disruption, and success (Hardaker, 2010). Individuals intend to deceive their victims by using a fake identity, being malicious and provocative, taunting, and disruptive with the aim of achieving attention, thus resulting in trolling success (Hardaker, 2010). Most importantly, research has shown that the negative psychological outcomes of being harassed online are similar to the psychological outcomes of harassment in person (Feinstein, Bhatia, & Davila, 2013). As such, it is imperative to continue exploring predictors of trolling behaviours in different online domains. In particular, individual differences are useful in predicting these behaviours online (Buckels et al., 2014; Craker & March, 2016).

1.1. Predictors of trolling behaviours: sex and dark personality traits

Relative to women, men report more frequent engagement in Internet trolling behaviours and higher levels of trolling enjoyment (Buckels et al., 2014) - findings which have more recently been replicated specifically for the social networking site Facebook® (Craker & March, 2016). Researchers have also considered the role "dark" personality traits play in predicting online behaviours. For example, narcissism has been linked to increased self-promotion (Carpenter, 2012), and Machiavellianism has been linked to relational aggression in women (Abell & Brewer, 2014). These dark traits have also been explored in relation to perpetration of trolling behaviours (e.g., Buckels et al., 2014; Craker & March, 2016). Specifically, the Dark Tetrad traits (e.g., narcissism, Machiavellianism, psychopathy, and sadism; Chabrol, Leeuwen, Rodgers, & Sejourne, 2009) explain an additional 12.5% more variance than age and sex (Craker & March, 2016). To date, despite the popularity of online dating sites and the continuously growing popularity of LBRTD apps, trolling on these LBRTD apps are yet to be considered. As the Dark Tetrad traits have been associated with trolling behaviours on other online forums, the current study explores the utility of these traits predicting perpetration of trolling behaviours on LBRTD apps.

Although trolling behaviours and online dating are yet to be explored, other negative aspects of online dating have received some research attention, such as online dating romance scams (e.g., Buchanan & Whitty, 2014) and potential sexual health risks when using these services primarily for sexual purposes (e.g., Couch & Liamputtong, 2008). Importantly, the threat of being trolled on LBRTD apps is a common concern (Weiss, 2015). Considering that roughly 57% of women and 21% of men who have used online dating sites and LBRTD apps report being harassed, and that LBRTD apps produce higher rates of harassment in comparison to online dating sites (Burgess, 2016), research examining the factors underpinning these anti-social behaviours is warranted. As such, the current study aimed to explore, in addition to sex, the utility of dark personality traits in predicting trolling behaviours on LBRTD apps.

1.2. Is the Dark Tetrad enough?

In an effort to provide a more comprehensive analysis of predictors of trolling behaviours, individual impulsivity was also incorporated. Impulsivity has been further conceptualised as both functional (adaptive) and dysfunctional (maladaptive) impulsivity (Dickman, 1990). Unlike functional impulsivity, which is associated with positive outcomes, dysfunctional impulsivity has been described as acting impulsively and carelessly without thinking about the consequences (Dickman, 1990) and has been likened to the concept of psychopathic impulsiveness (Zadravec, Bucik, & Sočan, 2005). Indeed, there is a significant association between trait psychopathy and maladaptive impulsivity (Woodworth & Porter, 2002), and between dysfunctional impulsivity and antisocial behaviours (Chabrol et al., 2009). As a result of the significant association between psychopathy and dysfunctional impulsivity, and previous research establishing psychopathy as an important predictor of online trolling behaviour (e.g., Buckels et al., 2014; Craker & March, 2016), we expected dysfunctional impulsivity to mediate possible relations between Dark Tetrad traits (particularly psychopathy) and trolling behaviours on LBRTD apps. Establishing dysfunctional impulsivity as a proximal mediator will further conceptualise trolling as a fast and careless behaviour (as suggested by Craker & March, 2016). In sum, in the current study it was predicted that gender (specifically male) and higher levels of Dark Tetrad traits would predict higher engagement in LBRTD app trolling behaviours, with dysfunctional impulsivity explaining further variance.

2. Method

2.1. Participants and procedure

Participants were recruited through advertisements on social media and email distribution, which included a URL link directing potential participants to the online survey hosted by surveymonkey.com. Participants were 357 adults (71% women; 29% men) aged 18–60 years of age ($M_{age} = 22.50$, $SD_{age} = 6.55$). The majority of the sample identified as having a heterosexual orientation (81%), followed by a bisexual orientation (10%), homosexual orientation (6%), and other orientation (3%). Selection criteria were that participants were adults and have previously used a LBRTD app. Tinder was the most frequently used app, with 92% of participants (90% men; 92% women) reporting currently using/having used the app.

2.2. Measures

Individual levels of narcissism, Machiavellianism, and psychopathy were measured with the Short Dark Triad Scale (Jones & Paulhus, 2014), a 27-item measure with 9-items specific to each trait. The narcissism subscale ($\alpha = 0.80$) contains items such as "*I insist on getting the respect I deserve*"; the Machiavellianism subscale ($\alpha = 0.77$) contains items such as "*I like to use clever manipulation to get my way*"; and the psychopathy scale ($\alpha = 0.73$) contains items "*people who mess with me always regret it*". Participants responded to each item on a five-point Likert scale (1 = *Strongly Disagree*; 5 = *Strongly Agree*), and responses were summed for an overall score for each trait.

The Short Sadistic Impulse Scale (O'Meara, Davies, & Hammond, 2011) is a 10-item measure of trait sadism. Participants rated their agreement (1 = *Strongly Disagree*; 5 = *Strongly Agree*) to statements such as "*People would like hurting others is they gave it a go*". Items are summed for an overall score of individual sadism ($\alpha = 0.84$).

The Dickman Impulsivity Inventory (Dickman, 1990) is a 23-item measure designed to assess impulsiveness and includes two subscales: Dysfunctional impulsivity and functional impulsivity. Dysfunctional impulsivity ($\alpha = 0.82$) is measured with 12-items and includes statements such as "*I frequently make appointments without thinking about whether I will be able to keep them*". Responses are dichotomous (True/False) and are then summed for a total score for each type of impulsivity. Only the dysfunctional impulsivity total score was included.

A modified version of Global Assessment of Internet Trolling (GAIT; Buckels et al., 2014) was used to measure individual trolling behaviours on LBRTD apps. For the purpose of the current study, the wording of the 4-item GAIT was modified to reflect trolling on LBRTD apps, rather than internet trolling in general. For example, "*I have sent people to shock websites for the lulz*" was modified to "*I have sent people on the App shock comments for the lulz*" (i.e., for the laughs)', *"I like to troll people in forums or the comments section of websites"* was modified to *"I like to troll people on the app"*,

Table 1
Descriptive statistics and sex differences.

	Mean (SD)			*t*	*d*
	Overall	Men	Women		
Narcissism	27.22 (3.47)	27.79 (3.52)	26.98 (3.43)	2.03*	0.23
Machiavellianism	26.66 (5.96)	27.62 (6.43)	26.25 (5.68)	2.02*	0.27
Psychopathy	20.89 (5.80)	23.88 (5.32)	19.70 (5.54)	6.58***	0.77
Sadism	16.43 (6.12)	18.90 (7.02)	15.51 (5.45)	4.43***	0.54
Dysfunctional impulsivity	4.35 (3.28)	4.33 (3.20)	4.30 (3.32)	0.08**	0.01
Trolling	6.56 (2.98)	6.72 (2.99)	6.46 (2.96)	0.78	0.08

Note. d = Cohen's d effect size.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 2
Pearson bivariate correlations for trolling scores (GAIT), narcissism, Machiavellianism, psychopathy, sadism, and dysfunctional impulsivity.

	1	2	3	4	5
1. Narcissism	–				
2. Machiavellianism	0.30***	–			
3. Psychopathy	0.17***	0.47***	–		
4. Sadism	0.01	0.21***	0.52***	–	
5. Dysfunctional impulsivity	0.03	0.11**	0.32***	0.17**	–
6. Trolling	0.11*	0.20***	0.32***	0.25***	0.22***

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

and *"I enjoy griefing other players in multiplayer games"* was modified to *"I enjoy griefing other people who access the app"*. The item "the more beautiful and pure a thing is, the more satisfying it is to corrupt" was not changed. Participants responded to each item by indicating how much they agreed or disagreed on a five-point scale (1 = *Strongly Disagree*; 5 = *Strongly Agree*). The four items were summed to obtain a measure of trolling behaviours on LBRTD apps (Cronbach's $\alpha = 0.74$).

3. Results

Compared to women, men were more psychopathic, narcissistic, Machiavellian, and sadistic, but there were no sex differences for trolling and dysfunctional impulsivity (see *t*-tests in Table 1). In addition, the correlations were invariant across the sexes. As such, the variable of participant's sex is not included in the model testing predictors of trolling behaviours on LBRTD apps. Bivariate correlations showed significant associations between all predictor variables and the criterion variable (see Table 2), supporting their inclusion in the regression analysis.

A 2-Step Hierarchical Multiple Regression Analysis tested whether the addition of dysfunctional impulsivity accounted for unique variance above the Dark Tetrad. At Step 1, the Dark Tetrad explained a 10.8% (adjusted R^2) of variance in trolling behaviours, $\Delta R^2 = 0.12$, $F(4, 352) = 11.75$, $p < 0.001$, $f^2 = 0.13$. At Step 2, the addition of dysfunctional impulsivity explained an overall 12.3% (adjusted R^2) of variance in trolling behaviours, and this change was significant, $\Delta R^2 = 0.02$, $F(1, 351) = 6.98$, $p = 0.009$, $f^2 = 0.03$. The overall model predicting LBRTD app trolling behaviours was significant, $\Delta R^2 = 0.14$, $F(5, 351) = 10.95$, $p < 0.001$, $f^2 = 0.16$. For the overall model, psychopathy ($\beta = 0.17$, $p = 0.011$), sadism ($\beta = 0.16$, $p = 0.015$), and dysfunctional impulsivity ($\beta = 0.14$, $p = 0.009$) predicted trolling behaviours, but narcissism ($\beta = 0.06$, $p = 0.280$) and Machiavellianism ($\beta = 0.06$, $p = 0.284$) did not.

As impulsivity is considered a key component of psychopathy (Morgan, Gray, & Snowden, 2011),[1] a moderation analysis was conducted to explore the possibility that psychopathy moderates the significant relationship between dysfunctional impulsivity and trolling. Specifically, a PROCESS moderation analysis was conducted to explore if dysfunctional impulsivity significantly predicting trolling would be affected by low, medium, or high individual levels of psychopathy (see Table 3). Results of this analysis showed that medium and high individual levels of psychopathy significantly moderated this relationship. In sum, dysfunctional impulsivity may predict trolling behaviours, but only if the individual has medium or high levels of trait psychopathy.

4. Discussion

Along with the positive outcomes associated with increased Internet communication, new antisocial behaviours contingent on the online context have also emerged (Craker & March, 2016). The current study explored predictors of these antisocial behaviours online, specifically on LBRTD apps (e.g., Tinder®, Blendr®, Grindr®). These apps are becoming increasingly popular, especially among younger adults (Pew Research Center, 2016). Thus, consideration of antisocial behaviours that occur on these apps is critical, considering that psychological outcomes of harassment online are shown to be equivalent to psychological outcomes of offline harassment (Feinstein et al., 2013).

In contrast to existing research reporting men engaging in trolling behaviour more so than women (e.g., Buckels et al., 2014; Craker & March, 2016), no sex differences were found regarding trolling behaviours on LBRTD apps. Furthermore, sex did not moderate any relationships between personality traits and trolling behaviours.[2] More broadly, the current finding is also inconsistent with existing findings related to sex differences in other antisocial interpersonal contexts, such as spitefulness (Jonason, Zeigler-Hill, & Okan, 2017), emotional manipulation (e.g., Grieve & Panebianco, 2013), and bullying (Azizli et al., 2016), including online interactions. Instead, our results indicate that LBRTD applications are an online platform where men and women engage in trolling behaviours equally.

Regarding men and women's trolling scores in the current study, a comparison of these scores to trolling rates in previous research (e.g., Buckels et al., 2014) revealed women's trolling scores has significantly increased, whereas men's remained the same.[3] A potential reason for the comparable trolling scores of men and women in the current study is perhaps women in the current sample have elevated levels of psychoticism and sadism, traits that have been found to be typically higher in men (see Jonason, Lyons, Bethell, & Ross, 2013). However, as such sex differences were replicated in the current study (see Table 1), it seems that the increased rates of women's trolling behaviours in the current study cannot be accounted for by higher levels of psychoticism and sadism.

As this study is the first to explore antisocial behaviours on LBRTD apps, interpretation of men and women's equal trolling scores is

[1] Thank you to an anonymous reviewer for this suggestion.

[2] A full copy of these analyses are available on request from the corresponding author.

[3] A full copy of these analyses are available on request from the corresponding author.

Table 3
PROCESS analysis for trait psychopathy moderating utility of dysfunctional impulsivity predicting trolling.

Level of psychopathy	*B*	*SE B*	*t*
Low	0.05	0.07	0.82**
Medium	0.12	0.05	2.57*
High	0.19	0.07	2.89***

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

speculative. It is possible that women may be engaging in higher rates of trolling behaviours, particularly with Demos (2016) reporting that women were just as likely as men to use derogative language (such as "slut" and "whore") on the social media platform Twitter. Regardless, the current study has shown that women's trolling behaviours on these apps are higher compared to other online areas such as forums, gaming (Buckels et al., 2014), and Facebook (Craker & March, 2016). This inconsistency may provide support for the premise that men and women's trolling behaviours may be context-dependent (Fichman & Sanfilippo, 2015). However, considering men consistently engage in more antisocial behaviours online than women do, further consideration of why women's trolling behaviours on LBRTD apps are comparable with men's behaviours is necessary. Perhaps users of these apps are viewed as easy trolling targets, as the "desperate" stigma associated with online dating (e.g., Smith & Duggan, 2013) has not yet completely abated. These apps may also be appealing as platforms for trolling as unlike online dating sites, LBRTD apps generally have no associated financial costs with use. Furthermore, future research could also explore who are being trolled on these apps. Specifically, the measure could be modified to explore if women are more commonly trolling other male or female users. This might be indicative of potential intra-sex competition, thus elucidating potential tactics women are employing when using these apps. Thus, future research should seek to establish whether men and women engaging in trolling behaviours on LBRTD apps are targeting individuals of the same or opposite sex.

Corroborating previous research on trolling behaviours, sadism and psychopathy were both associated with more trolling behaviours (e.g., Buckels et al., 2014; Craker & March, 2016). Based on these results, individuals who troll people on LBRTD applications may enjoy taunting and humiliating others and seek out opportunities to do so (i.e., trait sadism; O'Meara et al., 2011), and satisfy predatory impulsive goals with a brazen disregard for the pain caused to others (i.e., trait psychopathy; Lilienfeld et al., 2014). Also consistent with previous trolling studies, trait narcissism and Machiavellianism were not found to be predictive of trolling behaviours on LBRTD apps. As previously discussed (e.g., Craker & March, 2016), the self-absorption of narcissism and the strategic, manipulative nature of Machiavellianism may work in contrast with the impulsive, disruptive nature that is found in trolling behaviours (e.g., Pempek, Yermolayeva, & Calvert, 2009).

Dysfunctional impulsivity was also shown to predict engaging in trolling behaviours on LBRTD apps; specifically, individuals with high levels of dysfunctional impulsivity were more likely to troll others. However, impulsivity is considered a key element in trait psychopathy (Morgan et al., 2011), with subclinical trait psychopathy often conceptualised as high levels of impulsivity and thrill- seeking and low levels of empathy (Furnham, Richards, & Paulhus, 2013). As such, we decided to explore possible moderation effects of psychopathy on dysfunctional impulsivity, and results showed that trait psychopathy did significantly moderate the relationship between dysfunctional impulsivity and trolling behaviours on LBRTD apps. Importantly, this moderation was only significant for medium and high levels to trait psychopathy, indicating that dysfunctional impulsivity may positively predict engaging in trolling behaviours on LBRTD apps, but only if the individual had medium to high trait psychopathy. Based on results of the current study, individuals who engage in trolling behaviours on LBRTD applications may enjoy inflicting psychological and emotional harm on others (i.e., trait sadism), and this is combined with the tendency to act in a careless, impulsive manner (i.e., trait psychopathy and dysfunctional impulsivity).

4.1. Limitations and conclusions

One particular limitation of the current study was not further exploring the construct of psychopathy. In the current study, psychopathy was treated as a unidimensional construct (as supported by MacKay & Romney, 2003); however, previous research has indicates that trait psychopathy is comprised of two subtypes: Primary and secondary psychopathy (Skeem, Johansson, Andershed, Kerr, & Louden, 2007). Importantly, these two subtypes are considered to comprise of different facets, with primary psychopathy associated with low anxiety and impulsivity, and secondary psychopathy characterised by reactive hostility and high impulsivity (Skeem et al., 2007). Considering the current study found psychopathy to be a moderator of dysfunctional impulsivity, it would have been beneficial to have included a complete assessment to differentiate between the effects of primary and secondary psychopathy. Future research exploring engagement in trolling behaviours should endeavour to establish the utility of primary and secondary psychopathy in predicting this behaviour. Further, future research could also endeavour to establish the utility of the different facets of narcissism predicting trolling behaviours, as recent research has shown these facets to predict engagement in offending cyber bullying behaviours on online dating sites (Zerach, 2016).

Another potential limitation of the current study is the construct validity of the GAIT to successfully measure the harassing behaviours on LBRTD applications. Men and women had equal trolling scores, a finding inconsistent with previous research (e.g., Xia, Zhai, Liu, Sun, & Chen, 2016). Trolls have been described as the "villains of chaos and mayhem", and "the online Trickster we fear, envy, and love to hate" (Buckels et al., 2014, p. 101). Perhaps measuring trolling behaviours is not tapping into the construct responsible for the aggressive, harassing behaviours that are well documented on sites such as bye-felipe.com. Some examples of aggressive and abusive messages women have received include statements such as, "You're not a person to me, just an object", and "I would beat the living shit out of you". Statements such as these may indicate truly hostile, sinister intentions beyond the disruptive, attention-seeking troll. Perhaps a future qualitative approach exploring the content of this harassing behaviour might overcome any criterion deficiency. Such qualitative thematic analysis could also aid in development of a more comprehensive quantitative assessment tool, instead of trolling behaviours.

The current study provides information regarding the role of the dark personality traits of psychopathy and sadism in trolling behaviours on contemporary online dating platforms (i.e., LBRTD apps). The dating app troll, like the online troll, is sadistic, psychopathic, and dysfunctionally impulsive. Interestingly, unlikely the general online troll, the current results show that dating apps are equally likely to be male or female. As online harassment has the same psychological outcomes as harassment offline, including increased depression and lowered self-esteem (Feinstein et al., 2013), understanding the predictors of trolling behaviour is important. Results of the current study have implications for individuals who administrate and monitor LBRTD apps, as this information may assist these individuals in developing strategies to decrease trolling behaviour on these apps. Perhaps most importantly, the current study indicates that sex differences in trolling behaviours may be context dependent, and LBRTD apps provide a platform where men and women engage in similar trolling behaviours. However, these comparable results of men and women's trolling behaviours suggests the construct of trolling may not encapsulate the more sinister, abusive harassment that occurs during online dating, particularly on these LBRTD apps. Future research should endeavour to

further explore and quantify this more hostile behaviour so adequate prevention measures can be implemented.

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