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Exploring the Link between Bright and Dark Personality Traits and Different Types of Jealousy

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Abstract

The present study set out to examine the relationships between 'bright' and 'dark' personality traits and three different types of jealousy: reactive jealousy (negative emotions in reaction to a partner's infidelity), anxious jealousy (worrying about a partner's infidelity), and preventive jealousy (the need to prevent a partner from having contact with others). In so doing, we used both a general broad personality questionnaire and a Dark Triad questionnaire for the assessment of personality. In a heterogeneous sample of 680 participants, it was found that neuroticism was positively related to anxious and preventive jealousy, and introversion and hostility to all three types of jealousy. Structure was related positively to reactive jealousy, and Machiavellianism and narcissism to preventive jealousy. These results are largely in line with our hypotheses. The Dark Triad traits were found to have incremental validity in the prediction of preventive jealousy, with Machiavellianism being the best predictor of preventive jealousy. This suggests that preventive jealousy might be a bit 'darker' than previously thought. Practical implications for dealing with jealousy in relationships are discussed.

Keywords: personality, dark triad, jealousy

Introduction

Feelings of jealousy are usually experienced in response to a threat to, or the actual loss of, a valued (mostly sexual) relationship with another person, due to the presence of an actual or imagined rival for one's partner's attention (e.g., Bringle & Buunk, 1985; Dijkstra & Buunk, 1998). During the past two decades, evolutionary psychology has become one of the most dominant approaches for explaining why people experience jealousy (e.g., Wiederman & Kendall, 1999). According to evolutionary psychology, jealousy has evolved in our evolutionary past to alert individuals to take action to prevent a mate from abandoning the relationship (e.g.,

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Buss, 1994; DeKay & Buss, 1992). From an evolutionary perspective, an enduring pair bond between mates increases not only their own, but their offspring's chances of survival (e.g., Fisher, 2000). For instance, in contrast with the presence of only one parent, mates can share tasks with regard to childcare and provision of resources. Because individuals who experience and act on jealousy have a better chance of preventing the dissolution of their relationship, jealousy, according to evolutionary psychology, has evolved as an inherited psychological tendency (e.g., Buss, 1994, 2000).

Jealousy is generally considered to be a multidimensional phenomenon (e.g., Bringle & Buunk, 1985; Buunk, 1997; Mathes, 1991; Pfeiffer & Wong, 1989; Sharpsteen, 1991). In the literature on jealousy, various typologies have been proposed. Parrott (1991), for example, made a distinction between jealousy in response to a potential relationship threat ('*suspicious jealousy*'), and jealousy in response to a partner's extra-dyadic sex that had already occurred ('*fait accompli jealousy*'). Afifi and Reichert (1996; see also Knobloch et al., 2001) made a distinction between the *experience* and the *expression* of jealousy, and Buss and colleagues (1992) between *sexual jealousy* and *emotional jealousy*.

In addition to the aforementioned dichotomous typologies, two typologies have been proposed that distinguish three types of jealousy. First, Pfeiffer and Wong (1989) made a distinction between *emotional*, *cognitive* and *behavioural jealousy*, which reflect different dimensions of the experience of jealousy. Second, Buunk (1991, 1997; see also Buunk & Dijkstra, 2006) distinguishes between *reactive*, *preventive*, and *anxious jealousy*. These can be considered to be three qualitatively different types of jealousy. Reactive jealousy refers to the degree to which individuals experience negative emotions, such as anger and upset, when their partner is or has been emotionally or sexually unfaithful. For instance, individuals may become angry or feel hurt when their mate is flirting with or kissing someone else. Anxious jealousy refers to a process in which the individual ruminates about and cognitively generates images of a mate's infidelity, and experiences feelings of anxiety, suspicion, worry, and distrust (e.g., Dijkstra & Barelds, 2008). Finally, preventive jealousy refers to an individual's need to prevent contact of their partner with individuals of the opposite sex (or in the case of homosexuals: of the same sex). For example, those scoring high on preventive jealousy may find it hard to accept that their mate has opposite-sex friends, forbid their partner to socialize with others, and/or find it difficult to give their partner enough space in their relationship. More in general, preventive jealousy may be seen as the psychological antecedent of mate-retention behaviours, such as monitoring a partner's behaviour or aggression towards the partner or a potential rival (e.g., Barelds et al., 2020). It must be noted, however, that mate-retention behaviours, and also preventive jealousy, may also be expressed in positive behaviours (Buss et al., 2008). For instance, when preventively jealous, someone may buy jewellery or engage in risky forms of sex to keep his or her partner

interested in the relationship and deflect the partner's attention away from other males or females (Barelds & Dijkstra, 2007).

For several reasons the present study chose to examine jealousy using Buunk's (1991, 1997) typology, and the measure that is based on this typology. First, compared to most typologies of jealousy, Buunk's typology distinguishes between three rather than two types of jealousy, and in so doing paints a relatively nuanced picture of the experience of jealousy. Second, compared to the three types of jealousy distinguished by Pfeiffer and Wong (1989), Buunk's typology also considers that jealousy might not occur only in response to an *actual* rival, and therefore an actual relationship threat, but also in response to an *imaginary* rival, thus acknowledging that jealousy may also manifest itself in a more pathological way (e.g., Dijkstra & Barelds, 2008). More specifically, because reactive jealousy constitutes a direct response to an actual relationship threat (i.e., one's partner is, for instance, kissing or having sex with someone else), reactive jealousy can be considered a relatively "healthy" response. Responding with jealousy when one's partner has been unfaithful may even be considered a sign of love and commitment (Barelds & Dijkstra, 2007). This underlying dimension of the 'healthiness' of the jealousy response, therefore, provides more information about the experience of jealousy than the typology of Pfeiffer and Wong. Finally, research shows that Buunk's typology and the measure that is derived from it are well studied, valid and reliable (Buunk et al., 2020).

Jealousy and Personality

Empirical studies on jealousy and personality have particularly linked jealousy to personality characteristics such as insecurity and self-esteem, and have found that, as individuals are more insecure or have lower self-esteem, they report higher levels of jealousy (e.g., Jaremko & Lindsey, 1979; McIntosh, 1989; Mullen, 1994; Nadler & Dotan, 1992). Related, there is consistent evidence for a positive association between jealousy and neuroticism (e.g., Buunk, 1981, 1997; Dijkstra & Barelds, 2008; Mathes et al., 1982; Melamed, 1991; Tarrier et al., 1989; Xiaojun, 2002). An explanation that is often given for the positive relationship between neuroticism and jealousy and the negative relationship between self-esteem and jealousy is that neurotic and low self-esteem individuals (note that neuroticism is also negatively related to self-esteem; e.g., Dijkstra & Barelds, 2008) feel less adequate as a partner (cf. Peretti & Pedowski, 1997; White, 1981), and, as a consequence, feel more easily threatened by (potential) rivals.

Besides self-esteem and neuroticism, several other personality variables have been related to jealousy. For instance, jealousy has been found to be negatively related to personality characteristics such as extroversion (e.g., Mathes et al., 1982; Tarrier et al., 1989), rigidity (e.g., Buunk, 1997), and need for control (e.g., Brainerd et al., 1996). Although quite a few studies have related (types of) jealousy to

personality characteristics, most studies have only examined a few isolated personality characteristics in relation to jealousy. Using a more holistic approach, Buunk (1997) examined the relationships between jealousy and a variety of personality characteristics, and found jealousy to increase as individuals were more neurotic, socially anxious, rigid, and hostile, and had lower self-esteem. Likewise, Xiaojun (2002) related jealousy to a Five-Factor Model instrument and found an association between jealousy and neuroticism.

Dijkstra and Barelds (2008) conducted the most comprehensive study on the relations between personality and jealousy. Using Buunk's typology of jealousy, and two instruments that adequately cover the range of 'normal' personality characteristics in the Netherlands (the Dutch Personality Questionnaire and the Five-Factor Personality Questionnaire; see also Barelds & Luteijn, 2002), it was found that neuroticism related positively (and emotional stability negatively) to levels of reactive, anxious and preventive jealousy, meaning that neurotic individuals worry more about a partner's (potential) infidelity (anxious jealousy), are more inclined to prevent contact between their partner and members of the opposite sex (preventive jealousy), and react more intensely when their partners engage in extra-dyadic sex (reactive jealousy). The opposite was found for extroverted individuals, who experienced lower levels of all three types of jealousy. Extroverted individuals generally have less difficulty finding a new partner than introverted individuals. Therefore, relatively less is at stake for extroverts when their mate becomes unfaithful, which may explain these results (Dijkstra & Barelds, 2008). In addition, rigidity and conscientiousness (these two personality characteristics are strongly related; e.g., Barelds & Luteijn, 2002) were found to be related positively to reactive jealousy. Due to their strong expectations of sexual exclusivity, individuals scoring high on conscientiousness may experience stronger feelings of betrayal and emotional upset when their partner violates their expectations than individuals who are less conscientious. Likewise, we found that, as individuals are less hostile and thus more agreeable (e.g., Barelds & Luteijn, 2002), they tend to experience less feelings of reactive, anxious and preventive jealousy. This finding indicates that responding with jealousy to relationship threats seems to be less of a strategy for agreeable individuals than for less agreeable ones (Dijkstra & Barelds, 2008).

Because of relative scarcity of systematic research on jealousy and personality, taking into account different types of jealousy, the first aim of the present study was to replicate the relationships between different types of jealousy and personality traits. We decided to use Buunk's categorization of three types of jealousy for this purpose again, because this typology provides a more detailed distinction of jealousy than the other previously described typologies (Dijkstra & Barelds, 2008). Based on previous studies (Buunk, 1997; Dijkstra & Barelds, 2008), we expected to find consistent positive relationships between neuroticism (positive) and all three types of jealousy (H1). In addition, we expected to find consistent positive relationships between introversion (as the opposite of extroversion) and all three types of jealousy

(H2). We also expected to find a positive relationship between hostility (i.e., low agreeableness) and all three types of jealousy (H3), and a positive relationship between structure (the present study's operationalization of conscientiousness) and reactive jealousy (H4).

Dark Triad

The Dark Triad is an umbrella term used to describe a constellation of three sub-clinical personality traits: Machiavellianism, psychopathy, and narcissism (Paulhus & Williams, 2002). All three Dark Triad traits are short-term, self-serving, and exploitive social strategies that are related negatively to agreeableness, and positively to the use of dishonest and manipulative behaviours (Jonason & Webster, 2010). Those scoring high on Machiavellianism are characterized by their cynical and misanthropic beliefs, their callousness, their striving for agentic goals (i.e., money, power, and status), and their use of calculating, deceitful, exploitative manipulation tactics (Christie & Geis, 1970; Rauthmann, 2012; see also Wisse et al., 2015). Those scoring high on psychopathy may be described as individuals who lack empathy and feelings of guilt, and who are impulsive and thrill-seeking (e.g., Hare, 2003). It has been argued that high scorers lack a moral compass and therefore will not hesitate to use interpersonal manipulation or display anti-social behaviours if it would benefit them. Individuals scoring high on narcissism have a strong sense of entitlement, and a constant need for attention and admiration. They are considered to be arrogant, feel they are superior to others, and have a strong desire for power and status (e.g., Raskin & Terry, 1988; see also Wisse et al., 2015).

Several studies have shown the Dark Triad traits to be related to different aspects of individuals' mating behaviour (e.g., Barelds et al., 2020). Studies have, for instance, shown that individuals scoring high on one or more of the three Dark Triad traits are rated as being more attractive than individuals scoring low in these traits, especially in the case of short-term mating (e.g., Carter et al., 2014). This may be explained by the fact that those scoring high on the Dark Triad traits are more willing to take risks and come across as self-confident (e.g., Barelds et al., 2020). The Dark Triad traits also have been found to be associated with the way individuals respond to relationship threats (e.g., Jonason et al., 2011). Brewer and colleagues (2015) have, for instance, found that women with higher psychopathy scores had stronger intentions to take revenge by shouting and spreading rumours in response to a hypothetical scenario describing a partner's infidelity.

Recently, four studies also examined the relations between one or more of the Dark Triad traits and jealousy. In a study on the relationship between jealousy and psychopathy (Massar et al., 2016), it was found that secondary psychopathy predicted the experience of jealousy. In addition, several relationships were found in a study by Chin and colleagues (2017) between all three Dark Triad traits and emotional, cognitive, and behavioural jealousy (cf. Pfeiffer & Wong, 1989). Two

studies have related all three Dark Triad traits to the aforementioned three types of jealousy distinguished by Buunk (1997). Barelds and colleagues (2017) examined the relationships between reactive, anxious, and preventive jealousy and the Dark Triad traits among heterosexuals and homosexuals in the Netherlands. This study found the Dark Triad traits to be related positively to anxious and preventive jealousy. Finally, Barelds and colleagues (2020) examined, among others, the relationships between the Dark Triad traits and reactive, anxious, and preventive jealousy in samples from the Netherlands and Curaçao. This study largely confirmed the previously found relationships between the Dark Triad traits and different types of jealousy. Machiavellianism and narcissism were found to be positively related to preventive jealousy in both samples, and all three Dark Triad traits to anxious jealousy in the Curaçaoan sample. The relationships between the Dark Triad traits and anxious and preventive jealousy may be the result of high Dark Triad trait scorers' tendency toward short-term mating. As a result, individuals with high scores on the Dark Triad traits are relatively likely to believe that their partner is also interested in extra-dyadic sex, and report stronger feelings of anxious and preventive jealousy as a consequence (Barelds et al., 2017).

The second purpose of the present study was to try to replicate the relationships between the Dark Triad traits and the three types of jealousy distinguished by Buunk (1997). Based on previous studies, we expected to find positive relationships between the Dark Triad traits and anxious jealousy (H5) and preventive jealousy (H6). Moreover, the present study is the first to examine whether the Dark Triad traits have incremental validity in the prediction of the three types of jealousy in addition to 'bright side' personality traits. General personality models such as the Big Five model or the Five-Factor Model have been described as focusing on 'bright side' personality characteristics, whereas the term 'dark side' refers to traits that are dimensional representations of personality disorders (e.g., Furnham et al., 2014, 2012; Oluf & Furnham, 2015). The Dark Triad traits of narcissism and psychopathy can be thought of as subclinical dimensional representations of the narcissistic and anti-social personality disorders (APA, 2013). We will also examine which personality traits ('bright side' and 'dark side') are the best predictors of the three different types of jealousy.

Method

Participants and Procedure

Data were collected using an online questionnaire (set up in the online platform Qualtrics). The link to the study was distributed among students from the University of Groningen, who were in turn asked to send the link to others in their own network, and ask these people to forward the link as well. The link was clicked on 1010 times. Upon clicking the link, participants received information on the study, and were asked to give their informed consent. In 232 cases, no data was entered (these

individuals left the study upon reading the description). All others gave their consent and started filling out the questionnaire. It was decided to remove all participants (out of the 778 who had started the survey) who had 10% or more missing data. This led to the removal of 40 participants. As a quality control check, at the end of the questionnaire we asked participants whether they had answered the questions truthfully, and whether they advise us to use their data for our study. Those who reported not having given truthful answers and/or that advised us not to use their data were also removed (58 participants in total), leaving a final sample of 680 participants. This sample consisted of 217 male (31.9%) and 463 (68.1%) female participants. Mean age was 34.2 (*SD* = 12.6, range 17-72). 475 participants (69.9%) were in relationship at the time of the study, whereas 205 participants (30.1%) were not.

Instruments

Jealousy

Jealousy was measured using the scale developed by Buunk (1997; see also, for instance, Barelds & Dijkstra, 2003; Barelds et al., 2020), a scale consisting of 15 items; five items for reactive jealousy, five items for anxious jealousy, and five items for preventive jealousy. The items of the reactive jealousy scale asked participants how upset they would feel if their partner would engage in various extra-dyadic intimate and sexual behaviours, such as having sex or flirting with someone else. These items were assessed on 5-point scales, ranging from 1 (*not at all upset*) to 5 (*extremely upset*). Anxious jealousy was assessed by items such as "I am concerned about my partner finding someone else more attractive than me.". Items could be scored on 5-point scales, ranging from 1 (*never*) to 5 (*very often*). Finally, preventive jealousy was assessed by items such as "I don't want my partner to meet too many people of the opposite sex.". This questionnaire can be administered to both people in a relationship and singles. For each item, the five possible answers ranged from 1 (*not applicable*) to 5 (*very much applicable*). Reliability was estimated by calculating Guttman's lambda-2 coefficient (cf. Sijtsma, 2009). The values in the present study were $\lambda 2 = .81$ for reactive jealousy, $\lambda 2 = .91$ for anxious jealousy, and $\lambda 2 = .85$ for preventive jealousy.

Dutch Personality Questionnaire – Short Version

The short version of the Dutch Personality Questionnaire (DPQS; Barelds et al., 2018) was used to assess 'bright side' personality traits. The DPQ was developed in the 1970's as an instrument to measure broad personality characteristics, and is one of the most frequently used psychological instruments in the Netherlands. The DPQS is a recently developed short version of 70 items, that are answered on a three-point scale (*true-?- false*), with each scale consisting of 10 items. The seven personality

characteristics that are measured by means of the DPQS are Neuroticism (e.g., "I worry a lot", "I often feel sad"), Introversion (e.g., "I don't like talking to strangers", "I easily connect with other people"; reversed), Structure (e.g., "I work accurately", "I often do things in a fixed sequence"), Hostility (e.g., "I distrust friendly people", "I think that most people are reliable"; reversed), Egoism ("People often think I am egotistical", "I am interested in other people"; reversed), Dominance (e.g., "I have a lot of influence over other people", "I often tell other what to do"), and Self-esteem (e.g., "I am well able to solve my own problems", "I usually achieve what I want"). The DPQS has excellent psychometric properties (e.g., Evers et al., 2009–2021), with, for example, median lambda-2 coefficients (across samples) ranging from .74 to .89, test–retest correlations ranging from .75 to .93, and expected relations with several other (personality) instruments. Studies have shown a clear overlap between the personality characteristics assessed by means of the DPQ(S) and the Big Five (e.g., De Raad, 2000) and Five-Factor Model (e.g., Costa & McCrae, 1992) factors (e.g., Barelds & Luteijn, 2002; Barelds et al., 2018). The neuroticism scale, for example, relates strongly to other scales for assessing neuroticism/emotional stability, the introversion scale to other scales for assessing introversion/ extroversion, and the structure scale to scales for assessing conscientiousness. Strong relations have also been found between dominance and scales for assessing extroversion and intellect/autonomy, and between self-esteem and other self-esteem scales (Barelds et al., 2018). The scales for hostility (opposite of friendliness and trust) and egoism (opposite of altruism) are relatively independent of the Big Five and the Five-Factor Model factors (Barelds & Luteijn, 2002), but are most strongly related to agreeableness. In the present study, reliability estimates (λ2) were: neuroticism λ2 = .91, introversion λ2 = .87, structure λ2 = .82, hostility λ2 = .85, egoism λ2 = .71, dominance λ2 = .83, and self-esteem λ2 = .79.

Dark Triad Dirty Dozen

The Dark Triad traits were assessed by means of the Dark Triad Dirty Dozen (DTDD; Jonason & Webster, 2010). This instrument consists of 12 items that were assessed on 7-point Likert scale, ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). The three Dark Triad traits are assessed by four items each. Example items are "I have used deceit or lied to have my way" (Machiavellianism), "I tend to lack remorse" (psychopathy), and "I tend to expect special favors from others" (narcissism). Several studies have found the Dark Triad Dirty Dozen to be a valid and reliable instrument for assessing Dark Triad traits (e.g., Jonason & McCain, 2012). More specifically, in the Netherlands, the instrument has been found to have adequate psychometric properties (e.g., Barelds, 2016; Wisse et al., 2015). In the present sample, λ2 was .76 for Machiavellianism, λ2 was .62 for psychopathy, and λ2 was .76 for narcissism.

Results

Descriptives and Correlations

We first calculated means and standard deviations for all variables (the ten personality scales and the three jealousy scales). These are listed in Table 1. In addition, we calculated all correlations between the present study's variables, which are also listed in Table 1. All three types of jealousy are significantly related to each other (*p*s < .01), with correlations ranging from *r* = .35 to *r* = .57. Also, all Dark Triad traits are significantly related to each other, with correlations ranging from *r* = .17 to *r* = .43 (*p*s < .01). This is consistent with previous studies (e.g., Barelds, 2016). Correlations between the Dark Triad traits and the three types of jealousy are generally low, with only one significant correlation (Machiavellianism and preventive jealousy; *r* = .19, *p* < .01). Correlations between the DPQS scales and the three Dark Triad traits are generally low. The highest correlations are found for the Egoism scale, which correlates *r* = .30 with Machiavellianism, and *r* = .33 with psychopathy (*p*s < .01).

Hypothesis Testing

Based on previous studies, we expected to find consistent positive relationships between neuroticism and all three types of jealousy (H1). Table 1 shows that indeed all three correlations are positive, although the correlation between neuroticism and reactive jealousy is not significant (*r* = .10, *p* > .01). There was a moderate to strong correlation between anxious jealousy and neuroticism (*r* = .43, *p* < .01). These results largely confirm the first hypothesis. In addition, we expected to find consistent positive relationships between introversion (as the opposite of extroversion) and all three types of jealousy (H2). This hypothesis was confirmed (*r*s between .15 and .25, *p*s < .01). We also expected to find a positive relationship between hostility (indicative of low agreeableness) and all three types of jealousy (H3). This hypothesis was also confirmed (*r*s between .15 and .28, *p*s < .01). The expected positive relationship between structure (the present study's operationalization of conscientiousness) and reactive jealousy was also found (H4). In addition, structure was found to be significantly related to both anxious (*r* = .11, *p* < .01) and preventive jealousy (*r* = .17, *p* < .01).

With regard to the Dark Triad traits, we expected to find positive relationships between all Dark Triad traits and anxious jealousy (H5). This hypothesis was not confirmed. Both Machiavellianism and Narcissism were indeed positively related to anxious jealousy, but these correlations were not significant (*p*s > .01). We also expected to find significant positive relationships between the Dark Triad traits and preventive jealousy (H6). This hypothesis was partially confirmed: all correlations were positive, although only the correlations for Machiavellianism and narcissism were significant (*r*s of .19 and .11, *p*s < .01).

Table 1

Descriptive Statistics and Correlations

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Reactive jealousy	16.10	4.73	1											
2. Anxious jealousy	9.66	4.08	.35	1										
3. Preventive jealousy	7.46	3.36	.51	.57	1									
4. Machiavellianism	10.98	4.88	-.01	.07	.19	1								
5. Psychopathy	11.90	4.86	-.08	-.00	.09	.32	1							
6. Narcissism	13.25	4.63	.04	.08	.11	.43	.17	1						
7. Neuroticism	6.97	6.38	.10	.43	.26	.12	.00	.14	1					
8. Introversion	7.66	6.04	.15	.25	.22	.08	.05	.03	.48	1				
9. Structure	10.65	5.57	.15	.11	.17	.08	.05	.13	.20	.29	1			
10. Hostility	7.52	5.68	.15	.28	.24	.16	.18	.07	.46	.41	.24	1		
11. Egoism	3.41	3.39	.11	.15	.18	.30	.33	.10	.32	.44	.17	.43	1	
12. Dominance	10.03	5.33	-.11	-.10	-.06	.24	.19	.23	-.20	-.36	-.04	-.06	-.05	1
13. Self-esteem	14.84	4.54	-.12	-.33	-.21	-.06	.14	-.08	-.67	-.44	-.18	-.26	-.24	.39

Note. All correlations < -.11 or > .11 are significant at $p < .01$.

Incremental Validity of the Dark Triad Traits

Next, hierarchical regression analyses were conducted, in order to examine whether the Dark Triad traits explain additional variance on top of the other personality characteristics in predicting the three types of jealousy. Analyses were conducted for each type of jealousy separately. Age, gender and relationship status (in a relationship or single) were used as control variables[1], and were entered in the first step. In the second step, all seven DPQS scales were entered, and in the third step, the three Dark Triad traits were entered. The results are summarized in Table 2.

Table 2

Hierarchical Regression Results

	Reactive jealousy		Anxious jealousy		Preventive jealousy	
	ß	*t*	ß	*t*	ß	*t*
Controls						
· Age	-.10	-2.59*	-.09	-2.50*	-.12	-3.25**
· Gender	.21	5.24**	.05	1.39	.06	1.51
· Relationship	.01	0.16	.26	7.31**	-.01	-0.21
R^2	.05		.13		.03	
F	10.65**		32.92**		6.12**	
DPQS						
· Neuroticism	-.07	-1.23	.24	4.67**	.07	1.30
· Introversion	.02	0.37	.04	0.91	.05	0.98
· Structure	.09	2.34*	.02	0.47	.08	2.18*
· Hostility	.14	3.03**	.12	3.04**	.12	2.74**
· Egoism	.13	2.75**	-.04	-0.87	.02	0.32
· Dominance	-.06	-1.41	.01	0.20	-.02	-0.48
· Self-esteem	.00	0.08	-.08	-1.62	-.06	-1.15
R^2	.10		.27		.12	
ΔR^2	.06		.14		.09	
ΔF	5.79**		18.65**		10.23**	

[1] Age was significantly ($p < .01$) related to anxious jealousy ($r = -.20$), preventive jealousy ($r = -.16$), neuroticism ($r = -.18$), and self-esteem ($r = .14$), with older participants reporting lower levels of anxious jealousy, preventive jealousy, and neuroticism, and higher levels of self-esteem. Significant gender differences were found for reactive jealousy, Machiavellianism, psychopathy, hostility, egoism, and dominance, *F*s(1,679) from 9.57 to 49.28, *p*s < .01, with males scoring lower on reactive jealousy, and higher on all other scales than females. For relationship status, significant effects were found for anxious jealousy, psychopathy, neuroticism, and egoism, *F*s(1,679) from 7.12 to 80.39, *p*s < .01, with participants in a relationship scoring lower on all these scales than singles.

	Reactive jealousy		Anxious jealousy		Preventive jealousy	
	ß	*t*	ß	*t*	ß	*t*
Dark Triad						
· Machiavellianism	-.02	-0.43	.05	1.33	.13	2.99**
· Psychopathy	-.10	-2.39*	-.04	-1.12	.04	0.93
· Narcissism	.06	1.45	.00	0.08	.01	0.29
R^2	.11		.27		.14	
ΔR^2	.01		.00		.02	
ΔF	2.55		0.94		4.64**	

Note. All standardized regression coefficient are from the final step in the hierarchical regression analyses. Dummy coding for gender is 0 = male, 1 = female, and for relationship status 0 = in a relationship, 1 = single.
*$p < .05$; **$p < .01$.

The results in Table 2 show that those scoring high on reactive jealousy are, in terms of personality, more hostile and egotistical, and marginally more structured, and less psychopathic. High anxious jealousy scores are best predicted, in terms of personality, by high neuroticism and high hostility. High preventive jealousy scores are best predicted by high Machiavellianism and high hostility. The Dark Triad traits explain a significant amount of additional variance when it comes to preventive jealousy, but not reactive and anxious jealousy. In addition, the Dark Triad trait of Machiavellianism is found to be the best predictor of preventive jealousy. Of the other Dark Triad traits, psychopathy is found to be a predictor (albeit at $p < .05$: the exact $p = .017$) of reactive jealousy. When it comes to the prediction of jealousy, the personality scales used in the present study seem to be able to predict anxious jealousy better than the other two types of jealousy.

Discussion

The present study set out to examine the relationships between a combined set of 'bright' and 'dark' personality traits and three different types of jealousy: reactive, anxious, and preventive jealousy. Of these three, reactive jealousy can be thought of as a relatively normal response to a relationship threat, whereas anxious and preventive jealousy could potentially be more pathological in nature. We first aimed to replicate findings from previous studies (e.g., Dijkstra & Barelds, 2008; Barelds et al., 2020). In so doing, we found support for the expected positive relationships between neuroticism and particularly anxious and preventive jealousy (H1), the positive relationships between introversion (as the opposite of extroversion) and all three types of jealousy (H2), the positive relationships between hostility (indicative of low agreeableness) and all three types of jealousy (H3), and the positive relationship between structure (the present study's operationalization of conscientiousness) and reactive jealousy (H4). With regard to the Dark Triad traits,

the hypothesis that there would be positive relationships between all Dark Triad traits and anxious jealousy (H5) was not supported. The hypothesis that there would be positive relationships between the Dark Triad traits and preventive jealousy (H6) was largely confirmed, as Machiavellianism and narcissism were indeed related positively to preventive jealousy.

When it comes to the incremental validity of the Dark Triad traits in the prediction of the three types of jealousy, it was found that the Dark Triad traits only added to the prediction of preventive jealousy. Moreover, it was found that of all personality characteristics assessed in the present study, Machiavellianism was the best predictor of preventive jealousy, followed by hostility and structure (high scorers reported more preventive jealousy). Psychopathy appeared to be a marginally significant predictor of reactive jealousy, in the sense that those scoring high reported slightly lower levels of reactive jealousy.

To date studies on the relationship between personality and jealousy have focused on either the relationship between jealousy and bright *or* dark personality traits. Our study is the first to examine the combination of both bright and dark personality traits in relation to jealousy. This made it possible to disentangle the relative contribution of these traits in the prediction of different types of jealousy. As noted, results on the relations between the three types of jealousy and the bright personality traits were largely as expected and in line with previous studies. In contrast, relations between the three types of jealousy and dark personality traits were somewhat different than expected. First, in contrast to our hypothesis, we did not find anxious jealousy to be related to the dark traits of Machiavellianism, narcissism and psychopathy. As a consequence, this result combined with those from previous research reveals a somewhat mixed picture concerning the relationship between anxious jealousy and dark personality traits. Whereas two previous studies (Barelds et al., 2017, 2020) found relationships between anxious jealousy and the three Dark Triad traits in Dutch samples, in the present study's Dutch sample as well as the Curaçaon sample as described in Barelds et al. (2020) no relationship between the Dark Triad traits and anxious jealousy was found. According to Barelds et al. (2017) the relationships between the Dark Triad traits and anxious jealousy may be the result of high Dark Triad trait scorers' tendency toward short-term mating. (e.g., Jonason et al., 2010). As a result, individuals with high scores on the Dark Triad traits are relatively likely to believe that their partner is also interested in extra-dyadic sex, and project these beliefs on their partner, which may evoke worries and anxious jealousy. The fact that the present study and results from the Curaçaoan sample by Barelds et al. (2020) did not find such a relationship seems to indicate that this explanation is not always true or only under certain conditions. Future studies may help reveal the exact nature of these conditions. The fact that our study and part of Barelds et al.'s (2020) study did not find a relationship between anxious jealousy and the Dark Trait traits may be attributed to the possibility that individuals that score high on the Dark Triad traits may respond to jealousy-evoking situations externally, that is by focusing

their attention outwards, rather than internally, that is focusing inwards. Rather than worrying and ruminating about the potential loss of their partner and/or doubting their own attractiveness as a partner (anxious jealousy) they may try to control and manipulate their partner and/or rivals (preventive jealousy) to reduce the threat of infidelity. Consistent with this explanation, we indeed found both Machiavellianism and narcissism to be positively related to preventive jealousy, but not anxious jealousy. Research shows that, indeed, individuals who score high on the Dark Triad traits, when they feel provoked, tend to lash out more easily at others than individuals who score lower on these traits. For instance, all three Dark Triad traits have been found to be related positively to aggressive behaviour (Barlett, 2016), and stalking (March et al., 2020).

When it comes to the incremental validity of the Dark Triad traits in the prediction of the three types of jealousy, we found that the Dark traits only added to the prediction of preventive jealousy. This seems consistent with the above explanation. That is, in response to a threat of infidelity, high scorers on the Dark Triad traits may primarily focus their attention outward rather than inward, resulting in preventive jealousy. Moreover, of all personality characteristics assessed in the present study, Machiavellianism was the best predictor of preventive jealousy. An explanation for the relative importance of Machiavellianism in the prediction of preventive jealousy is that high scorers on Machiavellianism, compared to high scorers on the other two Dark Triad traits, are likely to be the most effective manipulators. The fact that Machiavellianism is such an important predictor of preventive jealousy sheds an interesting light on the nature of preventive jealousy. According to Barelds and Dijkstra (2007) preventive jealousy (in their study called possessive jealousy) can be seen as a relatively neutral relationship phenomenon, since their three studies showed no relation (neither positive nor negative) between relationship quality and preventive jealousy. They claim that the role of preventive jealousy in the relationship may depend heavily on the way in which preventive jealousy is expressed. For instance, when a preventively jealous partner buys flowers or jewellery to keep their mate interested, preventive jealousy may be positively associated with relationship quality. In contrast, when a preventively jealous partner resorts to violence or debasement to prevent the partner from becoming unfaithful, preventive jealousy is likely to be associated negatively to relationship quality. Although this may be true, the present study suggests that regardless of whether preventive jealousy is expressed in positive or negative behaviours, it has a relatively strong inherent manipulative component. For instance, instead of buying flowers just to make one's partner happy, the preventively jealous individual may buy flowers for his or her partner to steer the partner into making choices that are in the self-interest of the preventively jealous individuals. The fact that, in the present study, Machiavellianism was found to be the best predictor of preventive jealousy, which makes preventive jealousy a little bit 'darker' in nature than previously thought.

Strengths and Limitations

The present study largely replicated results found in previous studies between bright and dark personality traits and different types of jealousy, and was the first to examine the combination of both bright and dark personality traits in relation to different types of jealousy, making it possible to disentangle the relative contribution of these traits when it comes to different types of jealousy. We used a large heterogeneous community sample and reliable and valid instruments for the assessment of the present studies variables. A limitation of the present study is that the present study's recruitment procedure may have had a self-selection effect. Upon reading that the study was about personality and jealousy, participants may have dropped out because, for example, they experience strong feelings of jealousy and feel uncomfortable about that. Also, we have found evidence in a previous study (Barelds et al., 2014) that voluntary participation in a study (as compared to getting compensation for participation) has an effect on mean personality scale scores. More specifically, Barelds et al. (2014) found that mean hostility and egoism scores were higher in a paid sample than in volunteer samples, suggesting that those scoring high on hostility and egoism are less likely to enter a study such as the present one on a voluntary basis. In addition, these two particular personality characteristics were part of the present study's bright personality questionnaire, whereas one might wonder how bright these two characteristics actually are. Previous studies (e.g., Barelds & Luteijn, 2002) have, for example, found that whereas the other personality characteristics that are assessed by means of the Dutch Personality Questionnaire are strongly connected to the Big Five personality traits, hostility (as opposed to friendliness and trust) and egoism (as opposed to altruism) appeared to be relatively independent of these Big Five traits. Based on content alone, one might even expect these two traits to be related more to the Dark Triad traits than to, for example, the Big Five personality traits. The present study, however, only found some moderate relationships between egoism and Machiavellianism and Psychopathy, indicating that these two personality characteristics (hostility and egoism) are also relatively independent of the Dark Triad traits.

Another limitation of the present study is that some scales, most notably preventive jealousy and egoism, and to a lesser extent Machiavellianism, psychopathy, neuroticism and hostility had a skewed distribution, with mean scores that are clearly below the theoretical scale mean. The restriction of range of some scales (particularly preventive jealousy and egoism) may have had a negative effect on the present studies' correlations (that are, generally speaking, relatively low), as well as the reliability estimates of some of the scales. Ideally, we would have included, for example, more participants with elevated levels of jealousy and egoism (but see the point raised previously regarding voluntary participation).

Another limitation of the present study is the use of single-source data. Since jealousy is concerned, it would have been interesting to have been able to incorporate

the partner's perspective when it comes to the expression of jealousy as well. Maybe partner's perceptions of jealousy deviate from self-reported jealousy. This would also mean that only participants currently involved in a relationship would be eligible to participate. The present study, however, also included participants that are currently not involved in a relationship. Finally, because of the cross-sectional nature of the present study, we do not know anything about the causal nature of the presented relationships, although we assume that personality is not necessarily caused by feelings of jealousy.

Practical Implications

Couples and individuals who seek help for problematic feelings of jealousy are most likely to report problems due to anxious jealousy. This is not surprising. Barelds and Dijkstra (2006), for instance, found this type of jealousy – but not the other two types – to be negatively related to relationship quality, indicating that especially anxious jealousy may cause relationship problems. Likewise, having a look at the literature, cases of so-called obsessively jealous individuals who seek help usually suffer from extreme forms of anxious jealousy, characterized by excessive fear and rumination over a partner's possible infidelity (e.g., Cobb & Marks, 1979; Curling et al., 2018). In the case of no obvious infidelity mostly people who suffer from anxious jealousy – in its extreme form obsessive jealousy – recognize their fears as being irrational, and are ashamed or feel guilty for having these fears. This recognition makes them relatively open to seeking and/or accepting help.

Our study suggests that, when couples or individuals seek help for anxious jealousy, it seems wise to take a holistic view. That is, therapists should look at (problems with) jealousy as a part of a larger and broader complex of personal functioning (see also Dijkstra et al., 2010). Our finding (and that of previous studies) that neuroticism and anxious jealousy are related suggests that individuals or couples who experience problems due to this type of jealousy may best be helped by reducing stress in the relationship. For instance, couples usually do not make explicit rules on relationship boundaries or experience a lack of agreement regarding these rules (Dijkstra et al., 2013; Hertlein & Stevenson, 2010) which leaves ample room for misunderstandings and insecurities that may especially trigger anxious jealousy in neurotic partners. An important intervention for therapists is therefore to help the couple to set (new) rules about the boundaries of the relationship and/or to negotiate these rules and boundaries (Snyder et al., 2007). Is it, for instance, acceptable to send social media messages to ex-partners? And what about watching pornography?

Therapists who are confronted with couples or individuals who (also) seek help for problems due to preventive jealousy should consider the potential role of Machiavellianism in the relationship. It is very likely that, if one or both partners score high on Machiavellianism, manipulative behaviours are part of the relationship dynamic in general, and do not only appear in response to threats of infidelity. If

indeed manipulative behaviours seem part of the relationship dynamic, the therapist may help partners recognize patterns of manipulative behaviours and talk about what underlies these behaviours. Although this may, at first, evoke negative emotions, especially on the part of the partner that is being manipulated, eventually recognizing and talking about these patterns may deepen both partners' insight into the relationship and improve relationship function. More specifically, the therapists may use the technique of 'empathic joining' (Christensen et al., 2020) to help partners talk about vulnerable emotions, such as the fear of abandonment or rejection that may underlie manipulative behaviours. More in general, by empowering couples with better communication techniques, partners may become more open and honest with each other about their feelings and needs, reducing the tendency to manipulate their partner into doing what they want them to do, also in the case of feared infidelity.

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