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**Hello Darkness My Old Friend:**

**Preferences for Darkness Vary by Neuroticism and Co-occur with Negative Affect**

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Abstract

Metaphors frequently link negative affect with darkness and associations of this type have been established in several experimental paradigms. Given the ubiquity and strength of these associations, people who prefer dark to light may be more prone to negative emotional experiences and symptoms. A five study investigation (total  $N = 605$ ) couches these ideas in a new theoretical framework and then examines them. Across studies, 1 in 4 people preferred the perceptual concept of dark over the perceptual concept of light. These dark-preferring people scored higher in neuroticism (Studies 1 and 2) and experienced greater depressive feelings in daily life (Study 3). Moreover, dark preferences shared a robust relationship with depressive symptoms (Study 4) as well as generalized anxiety symptoms (Study 5). The results provide novel insights into negative affectivity and extend conceptual metaphor theory in a way that is capable of making individual difference predictions.

Keywords: Neuroticism, Negative Affect, Conceptual Metaphor, Darkness, Preferences

## **Hello Darkness My Old Friend:**

### **Preferences for Darkness Vary by Neuroticism and Co-Occur with Negative Affect**

Dark-light metaphors are pervasive in everyday speech and language (Kövecses, 2010). Whereas “light topics” are pleasant if somewhat inconsequential, “dark topics” are serious ones that can portend doom. Dark thoughts can be similarly described, and dark feelings tend toward the depressive (Zhang, Zuo, Erskine, & Hu, 2016). Indeed, when people describe depression, they frequently use darkness-related metaphors (McMullen & Conway, 2002), including those implying a loss in brightness perception (Barrick, Taylor, & Correa, 2002).

Conceptual metaphor theory (CMT) is a useful framework for thinking about these relationships. According to this theory, people use metaphors so that they can represent non-tangible thoughts and feelings in terms of more tangible, perceivable referents (Lakoff & Johnson, 1999). Metaphors seem to be particularly useful in representing forms of affect (evaluations, feelings) because they allow for more vivid representations than would otherwise be the case (Crawford, 2009). Consistent with this idea, linguistic metaphors are common when describing affective states (Gibbs, 1994; Kövecses, 2010).

There is a further feature to CMT that is pertinent. According to CMT, metaphors are a feature of thought and not just language (Lakoff & Johnson, 1999). That is, even when we are alone and not speaking to others, we still use conceptual metaphors to structure and make sense of our thoughts and feelings (Gibbs, 1994). Following such ideas, a fairly large number of studies have provided evidence for metaphoric structuring even in the absence of metaphoric phrases or communication goals (Landau, Meier, & Keefer, 2010). Included among these are a number of studies linking negativity to darkness (Lakens, Fockenberg, Lemmens, Ham, &

Midden, 2013; Lakins, Semin, & Foroni, 2012). When people are asked to evaluate colors, or to provide emotion labels for colors, they typically ascribe pleasant emotions to lighter stimuli and unpleasant emotions to darker stimuli (Clarke & Costall, 2008; Valdez & Mehrabian, 1994).

These links appear to be somewhat automatic in that negative evaluations are faster when stimuli are dark, even when stimulus color is irrelevant (Meier, Robinson, & Clore, 2004), and negative evaluations prime representations of darkness even in the context of response deadline procedures (Meier, Robinson, Crawford, & Ahlvers, 2007).

These associations between darkness and negativity could contribute to new ways of thinking about personality. Given that darkness connotes negativity (Crawford, 2009; Zhang et al., 2016), most people may prefer the concept of light to the concept of darkness. However, some people may prefer dark to light and these people could be prone to negative feelings, including depression (McMullen & Conway, 2002). One can think of the gothic lifestyle in this connection. Some teenagers, who tend to experience more negative affect than average, come to identify with the gothic subculture, which champions “dark” forms of clothing, music, and art (Rutledge, Rimer, & Scott, 2008). Identifying with this subculture, in turn, has been linked to a greater likelihood of future negative outcomes such as depression or self-harm (Bowes et al., 2015). Thus, preferences for darkness seem to co-occur with tendencies toward negative affective thoughts and feelings, even over time.

The gothic subculture is a multi-faceted one, however, and personality process considerations would benefit from a more formal model. In support of these aims, we explain how a balanced version of CMT can make novel personality-related predictions. We start with CMT. The most common conceptual metaphors are widely shared both within and across cultures (Kövecses, 2010; Lakoff, 1986). The metaphor-related association between darkness

and negative affect seems to fall into this category. For example, Adams and Osgood (1973) found that dark color words connoted negativity in over 20 cultures, including Iran, India, and Thailand. This metaphoric association likely builds on basic environmental correlations linking darkness to vulnerability, but it is also reinforced through linguistic and visual media (Winter, 2014). Accordingly, we begin by proposing a fairly robust – and normative (Lakoff, 1986) – mental association between darkness and negative affect (see horizontal lines of Figure 1).

Now consider what happens when the self (or self-concept) is added to this normative picture. The mind seeks balanced relations among its mental associations (Gawronski, 2012) and the self is a central node within this associative network (Cvencek, Greenwald, & Meltzoff, 2012). If the self is prone to negative affect, a positive mental association between the self-concept and a negative affect node should develop (Greenwald et al., 2002). Through balance-related mechanisms, this positive association should, according to balanced identity theory (Cvencek et al., 2012), pressure the self to favor concepts associated with negative affect, such as darkness. Because balance dynamics are bidirectional (Simon & Holyoak, 2002), though, one can also envision another, complementary pathway. If a person (a) is attracted to darkness and (b) darkness is closely linked with negative affect, then (c) the self should be prone to negative affect. In either case, mental associations are balanced when the person prone to negative affect also likes the concept of darkness, as depicted in the top panel of Figure 1.

Balanced identity considerations (Cvencek et al., 2012; Heider, 1958) should support a second configuration as well. If the self is not prone to negative affect, the association between the self-concept and a negative affect node should be negative rather than positive (Greenwald et al., 2002). This negative association should, in turn, pressure the self to disfavor concepts associated with negative affect, such as darkness (Meier & Robinson, 2005). Because balance

dynamics are bidirectional (Simon & Holyoak, 2002), though, another complementary pathway is also plausible. Specifically, if (a) darkness and negative affect are positively linked and (b) the self does not like darkness, then (c) the self should be somewhat less prone to negative affect, at least relative to a person who is attracted to the concept of darkness (Rutledge et al., 2008). In either case, balance would be achieved when the person low in negative affect prefers light to darkness, as depicted in the bottom panel of Figure 1.

We should be clear that we are presenting a model that has yet to be evaluated. Nonetheless, several components of the model have been tested and balance-derived predictions have received good support in many areas of research (Gawronski, 2012; Simon & Holyoak, 2002). As an example, objects linked to the self, even arbitrarily so, acquire a positive valence (Gawronski, Bodenhausen, & Becker, 2007). Furthermore, there is evidence for balanced relationships among implicit mental associations (Cvencek et al., 2012). In this connection, one can predict self-identification with math and science on the basis of mental associations linking the self to a gender (e.g., male) and that gender to math or science (males) or some alternative discipline (females) (Cvencek, Meltzoff, & Greenwald, 2011). Finally, there is some precedent for the present ideas in the form of a systematic relationship between the personality trait of agreeableness and one's liking for sweet foods. Agreeable, relative to disagreeable, people like sweet foods to a greater extent, and this relationship is consistent with metaphors linking sweetness to interpersonal caring (Fetterman, Meier, & Robinson, 2017).

If we are correct, then, one should be able to identify substantive individual differences in negative affectivity by asking a relatively simple metaphor-inspired question – namely, whether a person prefers light or dark. The model depicted in Figure 1 would be supported if there is a positive relationship between negative affectivity and preferences for darkness and the model

would be falsified if there is no such relationship. The balance dynamics that we build upon are subtle, however (Simon & Holyoak, 2002), and negative affectivity is multi-determined (Barlow, Ellard, Sauer-Zavala, Bullis, & Carl, 2014). It is also relevant to mention that darkness-related metaphors are used for representational purposes other than negative affect (Kövecses, 2010; Lakoff & Johnson, 1999). Such considerations suggest that the posited associations should be of medium rather than large effect size. We conducted five studies to test these ideas.

### Study 1

In the initial study, we asked people whether they preferred “light” or “dark”, presented as words rather than pictures to capture a suitable level of abstraction (Lakoff & Johnson, 1999). We hypothesized that people who preferred dark to light would be more prone to negative emotional experiences, as captured by the trait of neuroticism (Lahey, 2009).

### Method

#### *Participants and Procedures*

Participants were 149 (67.55% female, 87.42% Caucasian,  $M$  age = 19.26) undergraduates from an upper Midwest university seeking credit for their psychology classes. They signed up for a generically described social cognition study, arrived to the laboratory in groups of 6 or fewer, and completed the study in private computer rooms. In addition to the measures described below, participants completed other tasks pursuant to other (i.e., different) research questions (e.g., concerning cognitive control or social competence). These same general procedures were used in Studies 2-5 as well.<sup>1,2</sup>

#### *Preferences for Darkness*

We sought to assess preferences for darkness in a simple, but conceptual manner. The rationale for simplicity is that ours is a simple contrast – light versus dark. The rationale for

focusing on concepts, rather than more particular stimuli, is that concepts are especially relevant to CMT (Lakoff & Johnson, 1980) and to the primordial sorts of associations emphasized by metaphor theorists (Winter, 2014; Yu, 2015). Another goal was to distinguish groups of people. In this context, we reasoned that preferences for darkness should be non-normative and we wanted a measure capable of identifying particularly “dark” people.

Such considerations, among others (Lakens et al., 2012; Schietecat, Lakens, IJsselsteijn, & de Kort, 2018), led us to adopt a bipolar measurement strategy. Light and dark have a bipolar relationship to each other, such that the presence of one attribute is equivalent to the absence of the other (Valdez & Mehrabian, 1994). Moreover, it is the ends of this continuum, rather than the middle of it, that seem to possess metaphoric significance (Meier & Robinson, 2005). For example, the bible sharply contrasts a light path favored by God versus a dark path linked to wickedness and suffering (Jäkel, 2002), and similar bipolar symbolism can be found in numerous movies (Forceville & Renckens, 2013) and myths (Eliade, 1996). Further, previous experience with other metaphoric contrasts – such as the heart versus the head (Swan, 2009) – have supported the idea that bipolar items are particularly valuable when interfacing CMT with the personal process literature (Fetterman & Robinson, 2013).

Following from these lines of thought, we presented the simple, deliberately abstract question of “Which do you prefer?” within a MediaLab platform. Participants were forced to choose “light” or “dark”, which would place them within one of the two groups that we sought to contrast. In favor of this method, forced-choice measures have been recommended in many areas of psychology (Hontangas et al., 2015), in part because they eliminate some of the biases – such as acquiescence and extremity – that often plague Likert-based items (Christiansen, Burns, & Montgomery, 2005; Zavala, 1965). Indeed, forced-choice items are commonly used in the

perception (Hautus, Shepherd, & Peng, 2011) and preference (Palmer, Schloss, & Sammartino, 2013) literatures, literatures that we sought to speak to.

In Study 1, light versus dark preferences were assessed with a single item because there seemed to be only one direct way to ask the question that we sought to ask. This measurement strategy will be revisited in Study 5, however. The dark-light item was mixed with other preference questions (e.g., cats or dogs? PC or Mac?) in order to give people practice in making quick preference judgments while disguising the hypothesis.

### *Negative Affectivity*

The balance-related processes that we emphasize should generally work over longer rather than shorter time spans (Simon & Holyoak, 2002). Because this is true, we sought to focus primarily, though not exclusively, on trait-related forms of negative affectivity. Within the prominent model of personality – the Five Factor Model or Big 5 – negative affectivity is well-captured by the personality dimension termed neuroticism (Goldberg, 1993). Indeed, there are strong and pervasive links between neuroticism and all forms of negative affect, whether pertaining to sadness, guilt, hostility, or worry (Watson & Clark, 1992). These links are so strong that measures of neuroticism and trait negative affect are often indistinguishable from a factor-analytic perspective (Elliot & Thrash, 2002; Meyer & Shack, 1989) and Tellegen (1985) has argued that neuroticism should be relabeled in terms of negative emotionality. Whether one agrees with this perspective or not, it seemed good to begin our program of research by focusing on the trait of neuroticism, which will set the stage for later studies in the paper.

Accordingly, individual differences in negative affect proneness were assessed using Goldberg's (1999) neuroticism scale, which is reliable and valid and correlates highly with other neuroticism scales (John & Srivastava, 1999). In particular terms, participants indicated whether

10 statements reflective of high (“often feel blue”, “worry about things”) and low levels of neuroticism accurately describe the self (1 = very inaccurate; 5 = very accurate), with 2 items reverse-scored ( $M = 2.74$ ;  $SD = 0.80$ ;  $\alpha = .89$ ).

### Results

As might be expected, a preference for darkness was less common (26.85%) than a preference for light (73.15%). We next performed a one-way ANOVA to determine whether such preferences would relate to dispositional tendencies toward negative affect. Consistent with this idea, neuroticism levels varied by preferences,  $F(1, 147) = 4.37$ ,  $p = .038$ ,  $\eta_p^2 = .03$ , such that they were higher among dark-preferring people than light-preferring people, as shown in the top panel of Figure 2. Furthermore, the relationship between preferences for darkness and neuroticism levels remained significant when controlling for participant sex in a multiple regression,  $t = 2.71$ ,  $p = .032$ ,  $\beta = .17$ .

### Discussion and Study 2

Our balanced version of CMT led us to posit that people who prefer darkness would be prone to negative affect (see Figure 1). Consistent with these ideas, we found that preferences for dark over light were linked to higher levels of neuroticism. One can therefore make systematic inferences about negative affectivity solely on the basis of a metaphor-linked preference judgment. We recognize, however, that the findings are novel and replication is important. In Study 2, we therefore conducted a direct replication (Simons, 2014), again proposing that neuroticism levels would be higher among dark-preferring people.

### Method

#### *Participants and Procedures*

The procedures for Study 2 were identical to Study 1. The sample size was 111 (45.95% female, 85.59% Caucasian,  $M$  age = 19.91).

### *Measures*

We asked people whether they preferred “light” or “dark” in the same manner as Study 1. Negative affectivity was assessed using Goldberg’s (1999) neuroticism scale ( $M = 2.70$ ;  $SD = 0.86$ ;  $\alpha = .89$ ).

### Results

Roughly one in four preferred dark to light in Study 1. The percentage of people preferring dark was nearly identical in Study 2 (25.23%). Further, a one-way ANOVA revealed that neuroticism levels varied as a function of preference group,  $F(1, 109) = 7.92$ ,  $p = .006$ , and this group difference had a medium effect size,  $\eta_p^2 = .07$ . As shown in the bottom panel of Figure 2, neuroticism levels were again higher among participants who preferred dark to light, and this relationship remained significant when controlling for participant sex,  $t = 2.76$ ,  $p = .007$ ,  $\beta = .26$ .

### Discussion and Study 3

The results of Studies 1 and 2 provide evidence in favor of at least one form of “dark” personality. Some people prefer the perceptual concept of dark to light and these people are more prone to negative thoughts and feelings, as captured by the trait of neuroticism (Lahey, 2009; Watson & Clark, 1992). Other people, by contrast, prefer light to dark and these people are less prone to negative affect. Although these results provide an initial basis for linking dark preferences to negative affect, they have some limitations. What we specifically have in mind is that it sometimes makes sense to distinguish trait reports of negative emotionality from everyday experiences of negative emotion, which can be captured in daily diary protocols (Conner,

Tennen, Fleeson, & Barrett, 2009). The goal of Study 3, then, was to determine whether dark-preferring people actually experience more negative affect in their daily lives.

Two further features of the Study 3 protocol are worth noting. Neuroticism predisposes people to many different forms of negative affect (Watson, 2000; Watson & Clark, 1992). In Study 3, we wanted, instead, to focus more squarely on depressed feelings, which have been linked to darkness metaphor in several analyses (McMullen & Conway, 2002; Schoeneman, Schoeneman, & Stallings, 2004). To the extent that preferences for darkness are related to daily depressive feelings, these results could be considered an informative extension of the first two studies. In addition, we were interested in whether the dark/depression relationship would vary as a function of daily negative events. On the one hand, depressive feelings should be more pronounced when negative events occur (Bolger, Davis, & Rafaeli, 2003). On the other hand, “dark” thoughts could be systematically related to depressive feelings even in the absence of negative events. This possibility is consistent with the idea that people prone to negative affect are prone to it somewhat regardless of the circumstances (Watson & Clark, 1984).

## Method

### *Participants and Procedures*

A total of 145 (49.54% female, 93.52% Caucasian,  $M$  age = 19.28) undergraduates from an upper Midwest university signed up for a daily diary study. They first reported to a laboratory in groups of 6 or fewer and completed a number of tasks on computer. Among them was the light-dark preference measure of the first two studies. At the end of this two-week data collection effort, participants started a two-week daily diary study. On each of these 14 consecutive days, we sent daily reminder emails with subject numbers and links to the daily survey, which was

programmed with Survey Monkey. Participants were given from 5 p.m. of the day in question until early a.m. of the next morning to complete each survey.

On an a priori basis, we decided to omit participants who failed to complete at least 9 daily reports. This was accomplished by monitoring completion rates and asking people who missed 6 reports to stop doing the study. Only 10 people were omitted on this basis. Among the remainder, the average completion rate was 12.38 ( $SD = 1.50$ ).

### *Measures*

*Dark Preference.* In the laboratory, participants indicated whether they preferred “light” or “dark” and this measure was embedded in a more general preference survey (e.g., “dogs” or “cats”) so that choices would be made without too much deliberation.

*Daily Negative Affect.* We sought to assess a depression-related form of negative affect. Accordingly, we asked people to rate the extent to which (1 = not at all true today; 4 = very much true today) they felt “depressed” and “dejected” on each day. These items were averaged to characterize daily depressive feelings ( $M = 1.37$ ;  $SD = 0.60$ ;  $\alpha = .68$ , with day as the unit of analysis). In addition, participants used the same 4-point scale to indicate whether negative events had happened to them on a given day (“Today, something bad happened to me” & “Today, I experienced lots of unpleasant events”). These event-related items were also averaged ( $M = 1.51$ ;  $SD = 0.73$ ;  $\alpha = .87$ ).

Having computed some initial descriptive statistics, we then sought to understand reliability from both between- and within-person perspectives. The key between-person model was one in which we computed 14 day-specific NA (or negative event) scores. These scores were reliable across days ( $\alpha_s = .94$  &  $.80$  for daily affect & daily events), suggesting that the protocol was an appropriate one for our between-person hypotheses. We also calculated within-

person reliabilities, with the specific question of whether the two negative affect items (“depressed” & “dejected”) change across days in a parallel manner. These alphas averaged .77 and .54 for the negative event and affect measures, respectively.

### Results

A null predictor model revealed that 78.86% of the variance in daily negative events was due to within-person sources of variance and 21.14% was due to between-person sources. Thus, the daily negative event measure primarily assesses fluctuating conditions, as desired. By comparison, the other null predictor model revealed that 40.99% (59.01%) of the variance in daily negative affect was due to between-person (within-person) factors, indicating some dispositional tendencies with respect to negative affect that we sought to account for.

Because daily diary data have a nested structure (Nezlek, 2008), we used multilevel modeling (MLM) procedures (Singer, 1998) to test key hypotheses. Preferences for darkness constituted the level 2 – or between-subjects – predictor and daily negative affect was the outcome variable. In a single-predictor MLM, preferences for darkness related to daily depressive feelings, such that people who preferred dark ( $M = 1.52$ ) to light ( $M = 1.30$ ) had higher levels of daily negative affect,  $b = .09$ ,  $t = 2.68$ ,  $p = .008$ . This remained true when controlling for participant sex in a second MLM,  $b = .09$ ,  $t = 2.70$ ,  $p = .008$ .

We next sought to determine whether the darkness/depression relationship was contingent on the occurrence of negative events or not. This third model included both the level 2 predictor of darkness preference and the level 1 predictor of daily negative events, with the negative event variable person-centered (Enders & Tofighi, 2007). In this MLM, darkness preferences had a significant relationship with depressive feelings,  $b = .09$ ,  $t = 2.69$ ,  $p = .008$ . In addition, depressive feelings were more pronounced on days on which negative events occurred

more frequently,  $b = .18$ ,  $t = 9.62$ ,  $p < .001$ . However, there was no hint of an interaction,  $b = .01$ ,  $t = 0.73$ ,  $p = .465$ . Thus, a preference for darkness co-occurred with depressive feelings regardless of whether negative events were common or rare on a given day.

### Discussion

Given the results of Studies 1 and 2, it seemed important to show that preferences for darkness are related to everyday experiences of negative emotion as well as trait-related variations in negative emotionality. We therefore conducted a daily diary study, which allowed us to assess daily feelings of negative affect repeatedly over the period of two weeks. Dark-preferring people were more depressed and dejected as they went about their lives, relative to light-preferring people. Although the levels of depressive affect were no doubt subclinical for most people, these results are nonetheless consistent with a robust body of metaphors linking darkness and depression (Schoeneman et al., 2004). Preferring darkness, we suggest, can be linked to experiences that are metaphorically consistent with darkness, such as depression.

Study 3 also provided some clues to the nature of this relationship. Although depressive feelings increased with daily negative events (Bolger et al., 2003), and this within-subject relationship tended to be stronger than the level 2 main effect that we emphasized, it was nonetheless true that the darkness/depression relationship was not contingent on exogenous factors. Rather, the negativity of dark-preferring people seems to be somewhat chronic to them, much as people high in negative affectivity seem to be prone to negative affect regardless of the circumstances (Watson & Clark, 1984). Even so, we entertained the possibility, in Study 4, that preferences for darkness could be particularly problematic at higher levels of neuroticism.

### Study 4

In Study 4, we assessed both neuroticism and recent experiences of depression, in the latter case using the revised version of the Beck Depression Inventory (BDI-2: Beck, Steer, & Brown, 1996). Consistent with Studies 1 and 2, we expected neuroticism levels to be higher among dark-preferring people than light-preferring people. Consistent with Study 3, we hypothesized that depression levels, too, would be elevated among dark-preferring people. In addition, Study 4 examined whether neuroticism and a preference for darkness might interact with each other in the prediction of depression levels. The rationale here is that depression is unlikely in the context of low levels of neuroticism (Barlow et al., 2014; Watson, 2000) and therefore that preferences for darkness should matter particularly at high levels.

## Method

### *Participants and Procedures*

In Study 4, we recruited 128 (60.78% female, 87.50% Caucasian,  $M$  age = 19.52) undergraduates who received course credit. The darkness preference item was embedded in a larger choice questionnaire (e.g., PC or Mac?) that was not immediately contiguous with either the neuroticism or depression measures.

### *Measures*

*Dark Preference.* People were asked whether they prefer “light” or “dark”. They clicked a button next to their preferred perceptual concept (see Study 1).

*Neuroticism and Depression.* Tendencies toward negative affectivity were again assessed using Goldberg’s (1999) 10-item neuroticism scale ( $M = 2.69$ ;  $SD = 0.80$ ;  $\alpha = .88$ ). In addition, we assessed the extent to which participants had experienced depressive symptoms over the past week with the well-validated (Dozois, Dobson, & Ahnberg, 1998; Osman, Kopper, Barrios, Gutierrez, & Bagge, 2004) BDI-2 (Beck et al., 1996). Each of the 21 questions ask participants

to make a forced choice between four options, and these choices are scored from 0 (e.g., “I am not discouraged about my future”, scored 0) to 3 (e.g., “I feel my future is hopeless and will only get worse”, scored 3), with higher numbers reflecting greater depression (Beck et al., 1996). An average score was computed ( $M = 0.39$ ;  $SD = 0.46$ ;  $\alpha = .87$ ) and the correlation between neuroticism and depressive symptoms was  $r = .54$ ,  $p < .001$ .

### Results

Consistent with previous results, about a quarter of the participants (25.78%) preferred dark to light. Also consistent with previous results, a one-way ANOVA revealed that dark-preferring people had higher neuroticism levels ( $M = 3.09$ ;  $SD = 0.79$ ) than light-preferring people ( $M = 2.55$ ;  $SD = 0.76$ ),  $F(1, 126) = 12.26$ ,  $p = .001$ ,  $\eta_p^2 = .09$ , and this relationship remained significant when controlling for participant sex,  $t = 3.45$ ,  $p < .001$ ,  $\beta = .29$ . The darkness/depression relationship was even stronger, as depressive symptoms were more evident among the dark-preferring group ( $M = 0.70$ ;  $SD = 0.49$ ) than the light-preferring group ( $M = 0.29$ ;  $SD = 0.30$ ),  $F(1, 126) = 21.99$ ,  $p < .001$ ,  $\eta_p^2 = .15$ ,  $t = 4.65$ ,  $p < .001$ ,  $\beta = .38$  when controlling for participant sex. Thus, preferences for darkness related to multiple forms of negative affect.

Preferences for darkness might be particularly problematic at high levels of neuroticism, though. To examine this possibility, we performed a multiple regression in which we entered neuroticism levels (z-scored), preferences for darkness (light = -1; dark = +1), and their interaction as predictors of BDI-2 scores (Aiken & West, 1991). In this multiple regression, preferring darkness was related to depression in both main effect terms,  $t = 2.60$ ,  $p = .010$ ,  $\beta = .21$ , and as a function of neuroticism levels,  $t = 2.08$ ,  $p = .040$ ,  $\beta = .17$ . Estimated means for the latter interaction are displayed in Figure 3 and further simple slopes analyses (Aiken & West,

1991) revealed that a preference for darkness shared a stronger relationship with depressive symptoms at the prototypically high (+1 *SD*) level of neuroticism,  $t = 3.97$ ,  $p < .001$ ,  $\beta = .37$ , than at the prototypically low (-1 *SD*) level,  $t = 0.41$ ,  $p = .680$ ,  $\beta = .05$ . Thus, preferring darkness may be linked to depression particularly in the context of trait-related negativity.

### Discussion

Darkness metaphors are particularly common in the domain of depression (Schoeneman et al., 2004). Preferring darkness may therefore be consistent with tolerating or even accepting depressive symptoms from a balance-related perspective (see Figure 1). On the basis of such ideas, we hypothesized that dark-preferring individuals would be more prone to depressive symptoms than light-preferring individuals and Study 4 confirmed a relationship of this type, in turn extending the depressive feeling data of Study 3. This relationship was particularly strong at high levels of neuroticism, which are more capable of translating “dark” thoughts into “dark” feelings (Muris, Roelofs, Rassin, Franken, & Mayer, 2005). To further explore these dynamics, we examined both anxious and depressive symptoms in Study 5.

### Study 5

Study 5 had several purposes. Preferences for darkness have thus far been assessed with a straightforward item asking people whether they prefer “light” or “dark”. In Study 5, we sought to determine whether preferences for darkness are evident across multiple items of this type. For example, do people who like darkness as a perceptual concept also prefer darker rooms to lighter rooms? To the extent that they do, it may be possible to create a multi-item scale of dark-light preferences, which would have utility in certain contexts.

Asking multiple questions of this type will also allow us to examine distributional properties. We think that people will show consistent preferences for darkness on the one hand or

lightness on the other and consistency should be evident in two ways. First, we should see good evidence of internal reliability across the multiple items. And second, people may cluster toward the ends of the multi-item distribution relative to the middle. If so, we will also be able to contrast uniform preferences for dark or light with mixed preferences. Given that dark is metaphorically negative more than light is metaphorically not negative (Meier & Robinson, 2005), a contrast of dark and mixed groups seems likely to yield more substantial differences in negative affect than a contrast of light and mixed groups.

Another purpose of Study 5 was to contribute further evidence concerning validity. We think that dark preferences should be assessed as we assess them – namely, in terms of perceptual concepts (Adams & Osgood, 1973). Nonetheless, preferences for darkness may exhibit some consistency across different measurement approaches. For example, people who prefer dark to light in a conceptual sense may also prefer colored stimuli that have a darker appearance. Study 5 provides pertinent evidence.

Returning to the darkness/NA relationship, Study 4 found that preferences for darkness covaried with depressive symptoms. In Study 5, we sought to replicate this relationship while also determining whether preferences for darkness relate to anxious as well as depressive symptoms. Because dark preferences are linked to negative affectivity (Studies 1, 2, & 4), it seems likely that such preferences would be linked to recent experiences of anxiety as well as recent experiences of depression (Clark, Watson, & Mineka, 1994). On the other hand, it is also possible that dark preferences are particularly implicated in the domain of depression given the prominence of darkness/depression metaphors (McMullen & Conway, 2002). Study 5 sought to investigate these alternative possibilities.

Finally, we were interested in whether we could replicate the interaction shown in Figure 3. We again hypothesized that dark preferences would interact with negative affectivity in the prediction of depressive symptoms, at least as assessed by the BDI-2 (Beck et al., 1996).

## Method

### *Participants and Procedures*

Participants were 72 (64.56% female, 89.87% Caucasian,  $M$  age = 19.08) undergraduates seeking course credit. They signed up for a personality and judgment study over the Internet and completed the study in groups of 6 or fewer.<sup>3</sup>

### *Measures*

*Dark Preferences.* We sought to determine whether people are consistent in their preferences for light or darkness across multiple items. Accordingly, we asked multiple questions, all retaining the choice-related format that is favored for studies of this type (Fetterman & Robinson, 2013; Robinson & Fetterman, 2014) as well as aesthetic preference studies more generally (Palmer et al., 2013). Participants were asked whether they prefer “light” or “dark”, as in the first four studies. In addition, they were asked whether they prefer “white” or “black”, “day” or “night”, “lighter” or “darker”, and a “lighter room” or a “darker room”. For all items, we scored the lighter choices as 1 and the darker choices as 2.

*Luminance Preferences.* We sought to validate the dark preference measure by showing that conceptual preferences for darkness translate into nonverbal preferences for darkness as well, within a luminance preference test. We used Microsoft Paint to create 1 inch squares that were prototypically blue, brown, green, orange, purple, and red. We then created two versions of each square, one that had a luminance value of 125 (which appeared light) and one that had a luminance value of 75 (which appeared dark). For each of 6 trials, participants had to indicate

which version of each square they preferred. We scored lighter choices as 1 and darker choices as 2 ( $M = 1.43$ ;  $SD = 0.32$ ;  $\alpha = .73$ ; McDonald's omega = .72).

*Pessimism.* We assessed pessimism for the future in a manner akin to the unrealistic optimism literature (Weinstein, 1980). Participants were asked to estimate the likelihood (1 = much below average; 7 = much above average) that 5 somewhat common, but decidedly negative (e.g., “being fired from a job” & “having a heart attack”), events would occur to them in the future, relative to other university students of the same age and sex. Pessimism for the future was defined in terms of an average of these likelihood ratings ( $M = 2.65$ ;  $SD = 0.79$ ;  $\alpha = .59$ ).

*Negative Affectivity.* Individual differences in trait negative affect (trait NA) were assessed by pairing the 10 item NA scale of Watson, Clark, and Tellegen (1988) with trait (“in general”) instructions. An average score was computed ( $M = 1.63$ ;  $SD = 0.57$ ;  $\alpha = .86$ ).

*State Negative Affect.* In addition to generalized tendencies toward negative affect, we were also interested in more momentary experiences. Accordingly, we asked people to rate how they were feeling “right now, at this moment” using the same 10 NA markers of Watson et al. (1988). Momentary NA levels, too, varied across individuals ( $M = 1.55$ ;  $SD = 0.65$ ;  $\alpha = .88$ ).

*BDI-2 Levels.* We sought to replicate the positive relationship between preferences for darkness and depressive experiences. In Study 5, like Study 4, we used the BDI-2 (Beck et al., 1996) as the primary measure in examining this hypothesis ( $M = 0.54$ ;  $SD = 0.41$ ;  $\alpha = .90$ ).

*General Distress Symptoms.* In order to gain a different perspective on pathological symptoms, we administered the general distress (GD) subscales of the Mood and Anxiety Symptom Questionnaire (MASQ; Watson et al., 1995), which probe for the severity of symptoms (1 = not at all; 5 = extremely) over the previous week. One 15-item GD scale targets symptoms that are common to anxiety and depression (e.g., “felt irritable”, “had trouble

concentrating”;  $M = 2.11$ ;  $SD = 0.69$ ;  $\alpha = .91$ ). A second 11-item GD scale focuses on general distress symptoms that have an anxious nature to them (e.g., “felt nervous”, “had an upset stomach”;  $M = 1.70$ ;  $SD = 0.57$ ;  $\alpha = .84$ ). And a third 12-item scale focuses on general distress symptoms that are more particular to depression (e.g., “felt depressed”, “felt worthless”;  $M = 1.88$ ;  $SD = 0.68$ ;  $\alpha = .93$ ). We were interested in whether darkness preferences might be related to all of these symptoms or just some of them.

## Results

### *Reliability and Distributional Properties*

Study 5 sought to advance measurement by determining whether dark preferences are consistent across multiple items. Evidence in favor of this possibility was found in the form of an alpha coefficient of .77, which can be considered acceptable for most research and assessment purposes (DeVellis, 2012). As another way of examining the internal consistency of this measure, we computed omega, an index that has been recommended by Dunn, Baguley, and Brunsten (2014). The McDonald’s omega coefficient was .78, which can also be considered acceptable (Revelle & Zinbarg, 2009). Thus, one can measure preferences for darkness in terms of the extent to which “dark”, “black”, “night”, “darker”, and “a darker room” are preferred to “light”, “white”, “day”, “lighter”, and “a lighter room” ( $M = 1.41$ ;  $SD = 0.35$ ).

We suspected, however, that this distribution would not be entirely normal because participants would tend to favor one pole of the dark-light dimension over the other (Robinson & Fetterman, 2014). This expectation was born out in that the percentages of participants who received scores of 1, 1.2, 1.4, 1.6, 1.8, and 2 was 27%, 16%, 16%, 16%, 8%, and 15%, respectively. This distribution is continuous, but relatively flat. Accordingly, it could also make sense, for certain purposes at least, to divide this continuous distribution into 3 groups: those that

uniformly prefer light (27%), those that uniformly prefer dark (15%), and those who make inconsistent choices across the 5 items (58%).

#### *Dark Preferences and Luminance Preferences*

We sought to validate the dark preferences scale by showing that it predicts the extent to which darker colors are preferred to lighter colors, in the form of the luminance preference test mentioned above. This correlation was significant,  $r = .49, p < .001$ . Thus, conceptual preferences for darkness translate into perceptual preferences that favor darker stimuli.<sup>4</sup>

#### *Dark Preferences and Negative Symptomology*

As in the prior studies, we hypothesized that dark-preferring people would be more prone to negative affect, and its related symptoms, than light-preferring people. In Study 5, we first examined this idea by correlating the continuous darkness preference measure with the cognitive, emotional, and symptom-related outcomes that were assessed. There was a positive relationship between darkness preferences and pessimism concerning the future,  $r = .26, p = .043$ , and this relationship remained significant when controlling for participant sex,  $t = 2.02, p = .048, \beta = .25$ . People preferring darkness may therefore tend toward greater pessimism, though further studies with dependent measures of this type would seem desirable.

In the next analyses, we turned to replication considerations. Consistent with prior studies, there was a significant correlation between preferences for darkness and trait negative affect,  $r = .37, p = .001$ , that remained significant when controlling for participant sex,  $t = 3.43, p = .001, \beta = .39$ . Furthermore, darkness preferences shared a relationship with state negative affect as well,  $r = .39, p = .001, t = 3.55, p < .001, \beta = .40$ , when controlling for participant sex. In another replication of Study 4, there was a positive relationship between darkness preferences

and BDI-2 scores,  $r = .33$ ,  $p = .008$ , that also remained significant when controlling for participant sex,  $t = 3.08$ ,  $p = .003$ ,  $\beta = .35$ .

In order to gain a broader perspective on mood/anxiety symptoms, we turned to the general distress scales of the MASQ. Greater preferences for darkness were associated with higher GD: depression scores,  $r = .31$ ,  $p = .009$ ,  $t = 2.92$ ,  $p = .005$ ,  $\beta = .33$  when controlling for participant sex. However, greater preferences for darkness were also linked to higher GD: anxiety symptoms,  $r = .38$ ,  $p = .001$ ,  $t = 3.56$ ,  $p = .001$ ,  $\beta = .41$ , and to higher symptoms of a mixed depression/anxiety type,  $r = .30$ ,  $p = .009$ ,  $t = 2.92$ ,  $p = .005$ ,  $\beta = .34$ . Thus, preferences for darkness are related to both anxiety and depression symptoms, a pattern of results that implicates negative affectivity in somewhat general terms (Clark et al., 1994).

It is intuitive to think that the relationship between dark preferences and higher levels of negative affect (NA) may be stronger than the relationship between light preferences and lower levels of NA (Lakens et al., 2012). We could examine this possibility by comparing groups of participants who uniformly preferred dark (a score of 2) or light (a score of 1) to those who displayed mixed preferences (a score between 1 and 2) across the items of the dark preferences scale. Table 1 displays these group-based means for each of the 7 outcomes of Study 5. As indicated there, all 7 of the ANOVAs that contrasted the medium and dark groups resulted in significant differences. By contrast, only 2 of the 7 ANOVAs that contrasted the medium and light groups resulted in significant differences. These analyses suggest that preferences for darkness have specific relevance in understanding negative emotional tendencies.

#### *Possible Interactions Involving Trait NA*

Preferences for darkness were associated with state NA, BDI-2 scores, and the multiple forms of distress captured by the MASQ. However, these relationships could be stronger at

higher levels of trait NA (see Figure 3). To examine possible interactions of this type, we performed 5 multiple regressions in which the outcomes mentioned above were analyzed as a function of centered versions of trait NA, the continuous measure of dark preferences, and an interaction term (Aiken & West, 1991). Trait NA by dark preference interactions were not observed for the MASQ subscales,  $t_s < 1.50$ ,  $p_s > .10$ , but there were significant interactions in the context of state NA,  $t = 2.30$ ,  $p = .025$ ,  $\beta = .20$ , as well as BDI-2 scores,  $t = 4.86$ ,  $p < .001$ ,  $\beta = .50$ . In both cases, preferences for darkness were more problematic at higher levels of trait NA (see Figure 4 for estimated means).

### Discussion

Studies 1-4 had shown that a single item asking people whether they prefer light or dark can be used to make systematic inferences concerning proneness to negative thoughts and feelings. Study 5 expanded this assessment approach by determining whether preferences for darkness were consistent across multiple different two-alternative choice items (Palmer et al., 2013). They were, and one can therefore scale people in terms of their darkness preferences using a multi-item scale, allowing for a more continuous form of measurement in the context of known and adequate degrees of reliability.

Darkness metaphors are commonly observed among depressive people (Barrick et al., 2002; McMullen & Conway, 2002). In line with these metaphors, Studies 3 and 4 showed that preferences for darkness can be linked to depressive feelings (Study 3) and symptoms (Study 4). Study 5 replicated such results, but also showed that the scope of the present balance-related dynamics appears to be more general. For example, the correlation between dark preferences and MASQ anxiety symptoms ( $r = .38$ ) was not smaller than the correlation between dark

preferences and MASQ depression symptoms ( $r = .31$ ). This suggests that dark-preferring people are prone to multiple forms of negative emotion, including both anxiety and depression.

Nonetheless, some specific processes are implicated with respect to the depressive symptoms of the BDI-2 (Beck et al., 1996). In two studies, we found that preferences for darkness were particularly related to these symptoms among people high in dispositional NA. These results accord with the analysis of Barlow et al. (2014) and encourage further explorations of the processes through which preferences for darkness contribute to psychopathology.

### General Discussion

Conceptual metaphor theory (CMT) is essentially a normative theory (Lakoff, 1986). That is, we share our conceptual metaphors and they influence all people in roughly the same way (Landau et al., 2010). What we show, by contrast, is that preference judgments are capable of transforming a normative theory into a source of profound individual difference variation. To the extent that one prefers one pole of a metaphoric contrast, we propose, one should be prone to experiences consistent with that pole. Or, more concretely, given that there is a close metaphoric link between negative affect and darkness (Crawford, 2009; Meier & Robinson, 2005), preferring darkness to light should tend to follow from, as well as reinforce, tendencies toward negative emotional experience. Five studies sought to provide support for these novel ideas.

If darkness possesses fairly strong negative connotations (Forceville & Renckens, 2013), then we might expect a preference for dark to be less common than a preference for light. These percentages were highly stable across the studies, such that almost exactly 1 of 4 people preferred dark to light (Study 1: 26.85%; Study 2: 25.23%; Study 3: 24.83%; Study 4: 25.78%). Of more importance, we were able to show that these individual differences matter. Dark-preferring people scored higher in trait neuroticism in Studies 1, 2, and 4, and in trait negative

affect (NA) in Study 5. Thus, and consistent with metaphors linking negative affect to darkness (Meier & Robinson, 2005), preferences for darkness were more common among people predisposed to negative thoughts and feelings in dispositional terms.

Dark metaphors are particularly common in the domain of depression (McMullen & Conway, 2002), and we therefore supplemented our primary focus on negative affect with a secondary focus on depression. As hypothesized, dark-preferring people were more prone to depressive feelings in their daily lives (Study 3), and they scored higher in the symptoms captured by the BDI-2 (Studies 4 & 5). However, these links were not unique in that preferences for darkness also covaried with anxious symptoms (e.g., “felt nervous”), as well as those common to both anxiety and depression (e.g., “had trouble concentrating”). Accordingly, preferences for darkness may serve as a general marker for negative affectivity, which tends to predispose people toward anxiety as well as depression (Clark et al., 1994).

#### *Further Questions and Interpretation*

The balance-related dynamics that we build on are powerful, but subtle. Consistent with balanced identity theory (Cvencek et al., 2012), people are attracted to objects associated with the self, but these influences can be modest (Pelham, Carvallo, & Jones, 2005), in part because there are also instrumental reasons for liking or disliking objects (Eagly & Chaiken, 1993). The same appears to be true in the color preference domain (Schloss, Poggessi, & Palmer, 2011). Similarly, there are many factors involved in negative emotionality (Barlow et al., 2014) and balance dynamics would constitute only a subset of them.

These considerations suggest that the relationship between preferences for darkness and negative emotionality could be systematic, but not large. Our findings are in line with this idea. For example, in Study 5, the correlation between darkness preferences and trait NA was .37 and

the correlation between darkness preferences and BDI-2 scores was .33. What we primarily emphasize is therefore the systematic nature of the posited relationships: People who preferred dark to light were consistently prone to negative emotional experiences and this was true across a variety of measures and time frames.

Balance-related dynamics are bidirectional. As an example, an attitude-behavior discrepancy could be rectified by either changing one's behavior or one's attitude (Gawronski, 2012). Similarly, one could achieve congruence in decision making either by making a decision that fits the facts or by weighting facts to fit one's decision (Simon & Holyoak, 2002). The same sorts of dynamics could be operative in the present context as well. By this logic, people prone to negative affect would come to appreciate the perceptual concept of darkness because it reminds them of themselves at some level (Greenwald & Banaji, 1995). Equally so, being attracted to darkness could reinforce tendencies toward negative affect because these two concepts are closely linked in metaphor (Meier & Robinson, 2005).

The findings seem consistent with these ideas. Neuroticism, which is a fairly stable trait (Barlow et al., 2014), related to preferences for darkness in several studies (e.g., Study 2). However, preferences for darkness were also linked to state-related experiences of negative affect, including daily depressive feelings (Study 3) and depressive symptoms during the previous week (e.g., Study 4). The findings therefore seem to implicate bidirectional relationships and dynamics (Simon & Holyoak, 2012), though further research along these lines would be desirable (e.g., see Schloss, Nelson, Parker, Heck, & Palmer, 2017).

We should emphasize that the consensual nature of the darkness/negative affect metaphor is an important basis for our hypotheses. People in our culture (Kövecses, 2010) – and in other cultures as well (Adams & Osgood, 1973; Yu, 2015) – learn to associate darkness with negative

affect. This association arguably has evolutionary roots (Schaller, Park, & Mueller, 2003) and it is reinforced through cultural media (Forceville & Renckens, 2013). As a consequence, preferring darkness may signify something important about the individual, specifically with reference to their negative thoughts and feelings. From this perspective, preferences for dark or light could be considered an implicit measure of personality (Robinson & Wilkowski, 2015) that gains its power through conceptual metaphor (Robinson & Fetterman, 2014).

Finally, although it is non-normative to prefer dark to light, our findings cannot be attributed to nonconformity (DeYoung, Peterson, & Higgins, 2002) in some type of general sense. We can make this point by considering additional data from Study 2. People who preferred dark (25%) to light (75%) did not prefer cats (37%) to dogs (63%),  $r = -.05$ ,  $p = .620$ , books (30%) to movies (70%),  $r = .08$ ,  $p = .431$ , or “wet” (20%) to “dry” (80%),  $r = .11$ ,  $p = .255$ , despite the non-normative nature of preferences for cats, books, and wetness. Thus, people who prefer dark to light do so for specific reasons rather than because of more general tendencies toward non-normative preferences or choices.

#### *Limitations and Future Directions*

There were reasons why we measured darkness-related preferences as we did, such as the bipolar nature of the relevant metaphors (Lakens et al., 2012; Yu, 2015). Nonetheless, we should admit that there is further work to do. Although Study 5 examined darkness-related preferences across multiple items, no studies employed test-retest procedures. This is a limitation because Generalizability Theory (Shavelson, Webb, & Rowley, 1989) advocates designs in which one measures the relevant construct across people, items, *and* occasions. Designs of this type can reveal how stable the individual differences are and whether their measurement would benefit from the addition of further items or repetitions of the assessment instrument (Shavelson &

Webb, 2006). When designs of this type are used, it can often become clear that even established assessment procedures could be further improved (Mushquash & O'Connor, 2006) and insights of this type would be valuable in the present context.

Other limitations relate to the personality side of the equation. Following previous qualitative (e.g., Schoeneman et al., 2004) and quantitative (e.g., Meier et al., 2004) work, we focused on the possibility that preferences for darkness would covary with negative affectivity and depressive symptoms. However, dark-light metaphors are invoked in other contexts as well, such as in symbolizing malevolence (Forceville & Renckens, 2013) or immorality (Yu, 2015). On the basis of these connotations as well as the present results, it seems reasonable to think that preferences for darkness could be linked to “dark” (Spain, Harms, & LeBreton, 2014) personality dispositions such as psychopathy or Machiavellianism, though the relevant work has yet to be performed (also see Persich, Steinemann, Fetterman, & Robinson, in press).

Our dark preference measure was simple in that it focused on the concepts of light and dark relative to colored patches or stimuli of a nonverbal type. This was intentional in that we sought to focus on “color concepts” (Adams & Osgood, 1973) rather than more particular colored stimuli, whose evaluations can vary in complex ways (Palmer et al., 2013). Nonetheless, more could be done with measures of the latter type (Robinson, Liu, & Bair, 2015). Also, the balance-related dynamics that we proposed could be tested in more direct ways. For example, pairing darker colors with the self should increase their hedonic value (Zhang & Chan, 2009) and preferences for darkness could fluctuate as a consequence of negative affect inductions (Lee, Andrade, & Palmer, 2018). These and other research directions seem useful in extending CMT to the realm of individual differences and personality processes.

### *Conclusions*

We sought to integrate CMT with balance-related ideas. Both despite, and likely because of, the negative connotations of darkness, roughly 1 in 4 people preferred the perceptual concept of dark to light. As hypothesized, these people scored higher in neuroticism and they were prone to experiences of anxiety and depression. The metaphors people live by can therefore be different metaphors, lighter for some and darker for others.

Disclosure of Interest

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## Footnotes

<sup>1</sup>For all studies, we sought adequate power (.80) to detect medium effect sizes, which were posited (Robinson & Fetterman, 2014). With the two-group designs of Studies 1-4, 128 participants would give us this degree of power and we obtained sample sizes in this range. This was done by running the studies for a fixed period of time, one that had resulted in similar sample sizes in previous research within the lab. We also sought approximately 120 participants in Study 5 and we ran this study for the same length of time. However, the participant pool was particularly depleted during the relevant semester and we ended up with a sample size of 72. Post-hoc power analyses revealed that Study 5 had .75 power to detect a medium effect size.

<sup>2</sup>We report results concerning all of the dark preference measures that were collected in the five studies. That is, preferences for darkness were measured with a single item in Studies 1-4 and with three scales (e.g., luminance preferences) in Study 5. Similarly, we report results concerning all measures of negative affectivity that were collected. Within each study, there were also assessments that were unrelated to the present hypotheses and these included measures of personality (e.g., extraversion), interpersonal behavior (e.g., arrogance), cognitive style (e.g., the Cognitive Reflection Test), and social orientation (e.g., empathy). The latter measures were included for routine assessment purposes or for other projects.

<sup>3</sup>There was a brief manipulation at the beginning of this study. Some participants completed an initial word evaluation task (1 = very unpleasant; 6 = very pleasant) with the lights turned off while others completed the same task with the lights at their highest setting. Under dark conditions, participants made more negative evaluations ( $M = 3.51$ ) than under light conditions ( $M = 3.87$ ),  $F(1, 70) = 6.36$ ,  $p = .014$ ,  $\eta_p^2 = .08$ , a hypothesized effect. After the word evaluation task, though, the lights were placed on a medium setting for all participants, who then

completed a number of filler tasks prior to the main study. Accordingly, the initial lighting conditions (-1 = light; +1 = dark) did not affect scores for any of the key variables from the study, all  $|rs| < .15$ , all  $ps > .30$ .

<sup>4</sup>We also asked people which colors – white (scored 1), gray (scored 2), or black (scored 3) – they would choose for various products: a car, a jacket, shoes, stereo speakers, a laptop, a t-shirt, and a refrigerator. This is not a very good measure of dark preferences because people will choose product colors for many reasons such as ability to hide dirt, scuff-resistance, etc., and these reasons will vary by product ( $\alpha = .32$ ). Stated another way, the sorts of self-related processes emphasized in Figure 1 would not necessarily be operative in these product choices. Despite these comments, there was a positive correlation between the linguistic measure of dark preferences and the product-based measure,  $r = .25$ ,  $p = .030$ .

Table 1

*Negative Emotion and Symptom Means as a Function of Dark Preference Group, Study 5*

Outcome	Light Group	Middle Group	Dark Group
Pessimism	2.67 <sup>a</sup>	2.55 <sup>a</sup>	3.35 <sup>b</sup>
Trait NA	1.43 <sup>a</sup>	1.58 <sup>a</sup>	2.17 <sup>b</sup>
State NA	1.31 <sup>a</sup>	1.50 <sup>a</sup>	2.18 <sup>b</sup>
BDI-2	0.34 <sup>a</sup>	0.49 <sup>a</sup>	0.82 <sup>b</sup>
GD: Depression	1.64 <sup>a</sup>	1.88 <sup>a</sup>	2.41 <sup>b</sup>
GD: Anxiety	1.45 <sup>a</sup>	1.68 <sup>b</sup>	2.14 <sup>c</sup>
GD: Mixed	1.79 <sup>a</sup>	2.11 <sup>b</sup>	2.63 <sup>c</sup>

Note: NA = Negative Affect; BDI = Beck Depression Inventory; GD = General Distress. Means that do not share a superscript are significantly different from each other ( $p < .05$ ).

Figure 1

*Balance Dynamics Supporting Greater (Top) and Lesser (Bottom) Negative Affect*

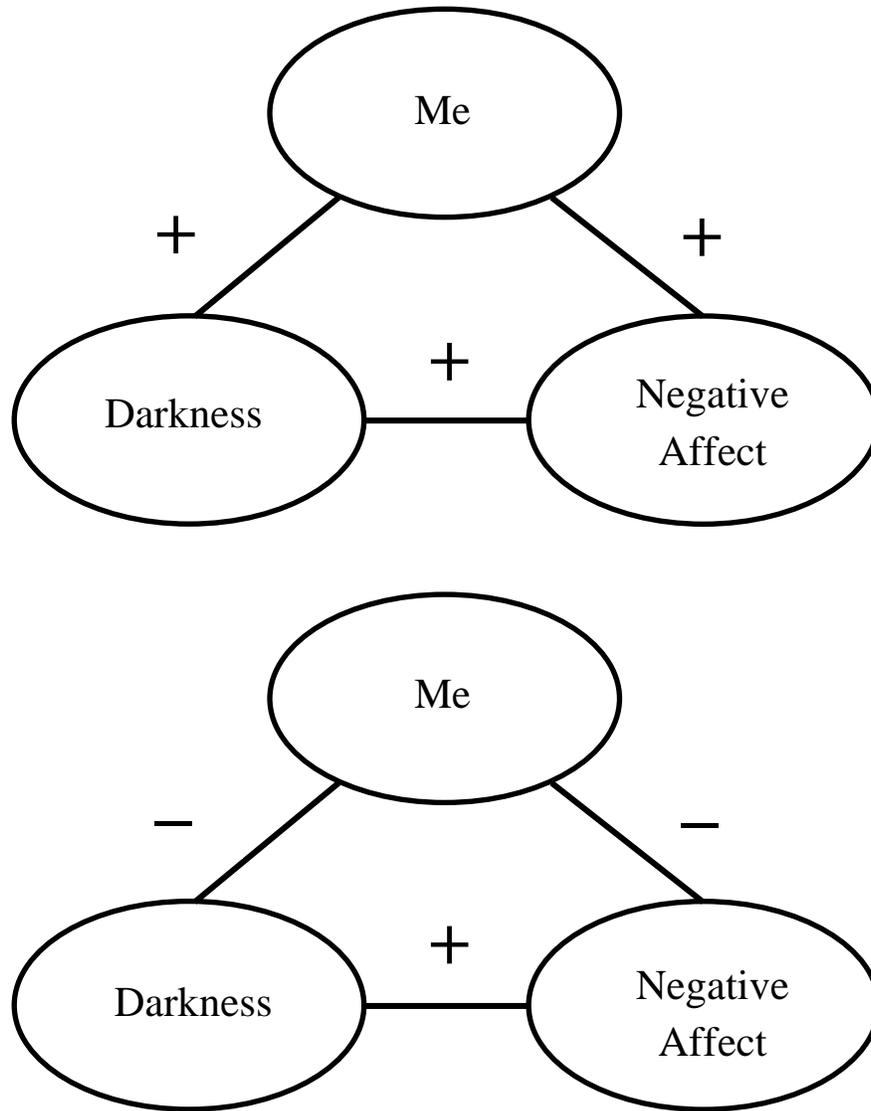


Figure 2

*Neuroticism Levels as a Function of Dark-Light Preferences, Studies 1 (Top Panel) and 2*

*(Bottom Panel)*

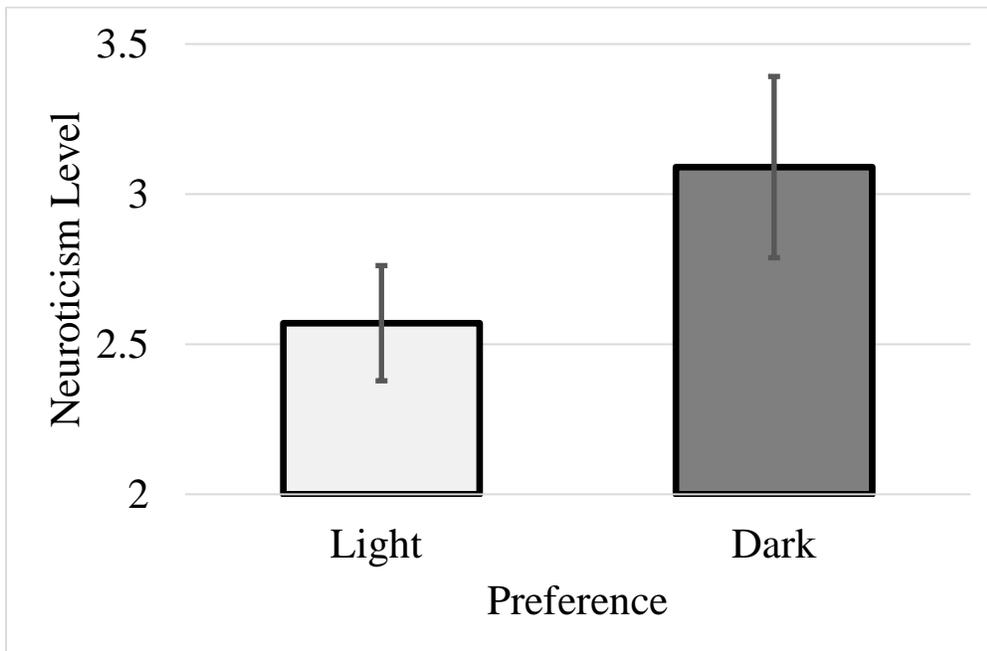
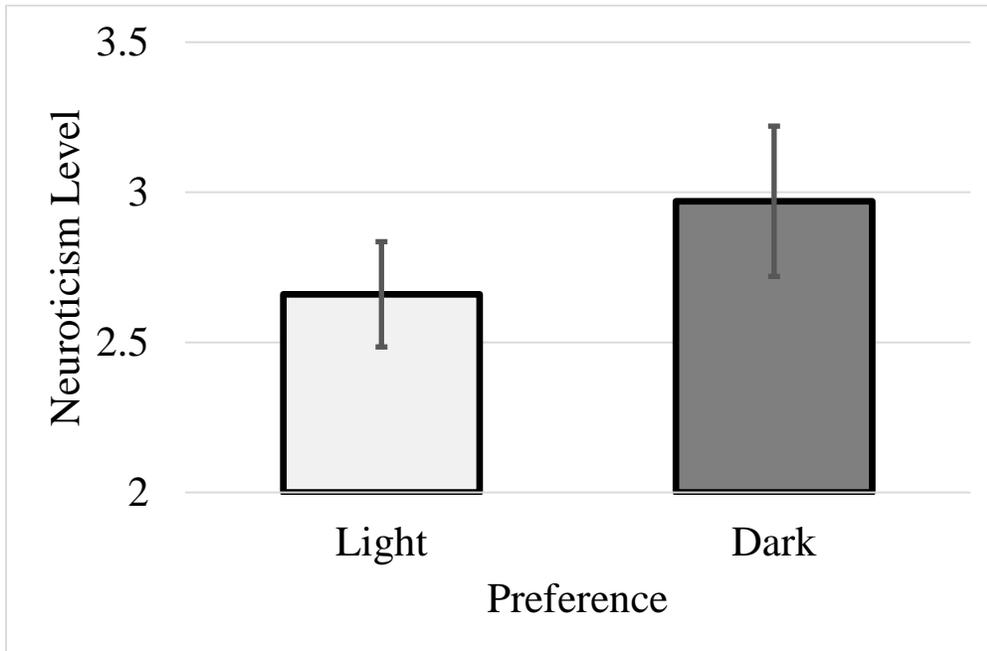


Figure 3

*Estimated Means for the Neuroticism by Dark Preference Interaction, Study 4*

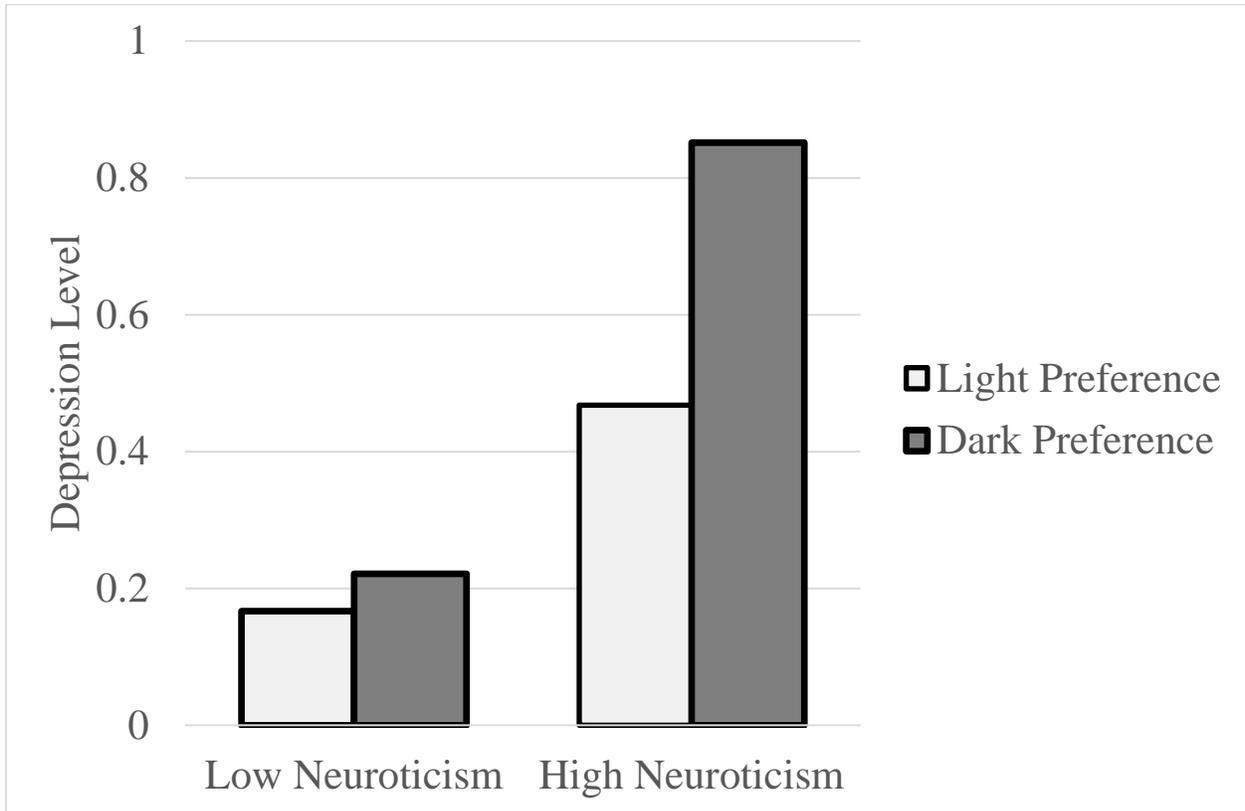


Figure 4

*Estimated Means for Trait NA by Dark Preference Interactions, Study 5*

