Morningness/Eveningness and Evolutionary Psychology: A Research Proposal

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Honors Thesis

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The present research proposal addresses *morningness and eveningness*—being an "early bird" or "night owl"—from an evolutionary psychological perspective. Specifically, the proposal uses the lens to enrich our understanding of how various theories in psychology conceptualize and measure morningness and eveningness. Because of the evolutionary framework, my proposal asks an essential question: how was being an early bird or night owl adaptive in our ancestral environments? What is adaptive often comes down to what can increase a person's ability to survive and/or reproduce. A raft of evolutionary psychological literature led me to believe that morning-types are more survival oriented, and evening-types are more reproduction oriented. I suggest that these orientations manifest in morning-types and evening-types levels of *disgust sensitivity*. Accordingly, the preliminary hypotheses regard disgust sensitivity—a person's proclivity to feel the emotion of disgust—in two specific domains: *pathogen disgust sensitivity* and *sexual disgust sensitivity*. I predict (a) that morningness will be positively related to pathogen disgust sensitivity and (b) that eveningness will be related to sexual disgust sensitivity. I use the *Morningness Eveningness Questionnaire,* the *Three-Domain Disgust Sensitivity Scale*, and other instruments—including the *Dark Triad Dirty Dozen*, the *Light Triad Scale*—to create secondary hypotheses that apply the lens of evolutionary psychology to past research on morningness and eveningness. I also use the Geher and Kaufman's (2016) *Mating Intelligence Scale* to fill a gap in intelligence research as it relates to morningness and eveningness. The study will use a correlational design; we plan to use Analysis of Variance to explore the relationships between our main predictor variable morningness/eveningness and our several outcome variables, including disgust sensitivity and mating intelligence.

Key Words: Psychology, Morningness, Eveningness, Disgust Sensitivity, Multiple Intelligences, Personality, Personality Disorders, Dark Triad, Light Triad, Evolutionary Psychology

Circadian Rhythm and Sleep Chronotype

Solar light and the social world intersect with genetics to regulate various aspects of human behavior (Montaruli et al., 2021). The temporal patterns associated with light/dark, work/rest, and our internal biology are called circadian rhythms: 24 hour internal clocks that affect our temperature, hunger, socialization, and sleep. People who eat, socialize, and sleep in patterns that are synchronized with their circadian rhythm are generally healthier than people who are out of sync with their internal clock. Dysregulation of these patterns, for instance, is associated with various diseases, such as diabetes, cardiovascular disease, and neurodegenerative diseases (Montaruli et al., 2021). Sleep and wake cycles are foundational to staying in sync with one's circadian rhythm; when we wake up sets the stage for our daily behaviors.

Not everyone operates on the same sleep-wake cycle. There are interindividual differences, for example, in preferences for *morningness* and *eveningness*. These preferences are known as *chronotypes* or *diurnal preferences*. People who are high in morningness—often referred to as early birds or larks—become active and alert early in the day, go to bed early, and wake up early. People who are high in eveningness—colloquially known as night owls—have more energy in the evening hours, go to bed late, and wake up late (Horne and Ostberg, 1976). There are numerous personal, social, behavioral, and cognitive differences that are associated with morningness and eveningness (Adan & Natale, 2022; Randler et al., 2017; Talliard, 2021; Akram, 2019; Preckel, 2011).

Morningness and Eveningness in Personality, Social, and Cognitive Psychology

Most people will not have an extreme morning or evening preference. In fact, only around 30% of the population is an extreme morning-type or evening-type (Adan & Natale,

2022). For people who do fall into those extremes, however, their behavioral tendencies—in some domains—significantly differ. According to a raft of psychological research on morningness and eveningness, personality, social interactions, cognition, and sexual behavior are related to sleep-wake preference (Adan & Natale, 2022; Randler et al., 2017; Talliard, 2021; Akram, 2019; Preckel, 2011).

In the realm of personality, Randler et al. (2017) examined whether individual differences in personality predict morningness and eveningness. The authors used a variety of self-report measures to assess diurnal preference; in particular, they used the *Horne and Ostberg (1976) Morningness-Eveningness Questionnaire*, a widely cited measure of sleep-wake preferences. To assess personality, the authors looked at *Big 5* personality traits. Morningness was predicted by agreeableness, and conscientiousness, while eveningness was predicted by openness to experience (Randler et al., 2017). According to Randler et al. (2017) there are in fact personality differences associated with morningness/eveningness; of course, different personalities will interact in different ways in the social world.

Social psychology holds that people with an eveningness disposition may suffer from a social jetlag effect; people who are predisposed to going to bed late and waking up late will suffer in a social world with a daytime schedule (Taillard et al., 2021; Randler and Vollmer, 2013). For example, recent inquiries have assessed the morningness/eveningness relationship with hostility and aggression: Randler and Vollmer used the *Buss-Perry Aggression Questionnaire* (Buss & Perry, 1992) to measure hostility, finding that hostility positively related to evening preference as assessed by *The Composite Scale of Morningness* (Smith et al., 1989). The realm of abnormal psychology accordingly suggests that eveningness predicts worse well-being than morningness and greater levels of psychological symptoms (Akram, 2019). In

their (2021) review, Taillard et al. acknowledge that psychiatric conditions, such as Attention Deficit Hyperactivity Disorder (ADHD) and mood disorders are displayed more in evening-types than in morning-types. In addition to focus and mood, the authors argue that evening-types who are operating on a morning schedule will experience difficulties in other types of cognitive performance: alertness, memory, and higher-order executive functions such as response-inhibition and decision making. To that end, there is a raft of research on cognitive performance in morning-types and evening-types.

Research in cognitive and learning psychology has shown that night owls have higher IQs than early birds (Preckel et al., 2011; Kanazawa, 2009); however, it was found that early birds do better in school (Preckel et al., 2011). The finding that evening-types possess greater intelligence than morning types is important to note when considering Taillard's (2021) observation that evening-types display worse cognitive performance than morning-types. This diminished performance is likely due to a mismatch of diurnal preference with daytime schedule. Preckel et al., (2011) used the tool of meta-analysis—focusing on the population effect size and homogeneity of scores—to make conclusions about morningness-eveningness, intelligence, and academic achievement. The authors found eveningness to be positively related to intelligence—measured only by standardized tests—and morningness to be positively related to GPA. Kanazawa (2009) additionally found that working-memory—which is positively related to intelligence—has a positive correlation with eveningness. He used an evolutionary lens, arguing that night-owls may have solved evolutionarily novel problems in ancestral environments. One evolutionarily novel problem was finding and keeping a mate. From an evolutionary perspective, there are important individual differences in mating and sexual behavior that are related to morningness and eveningness.

Morningness/Eveningness in Evolutionary Psychology

Sex Differences. In evolutionary psychology as in the raft of research on sleep, sex differences are of interest. Evolutionary psychological research suggests that men and women differ in some psychological domains (Buss, 1995), and some sleep research maintains that morningness/eveningness is one of those domains (Adan & Natale, 2002). Adan and Natale (2002), for example, provide evidence to suggest that morningness/eveningness is normally distributed, and men and women differ significantly in their mean scores. In other words, the majority of the population is not an extreme morning or evening type; however, the extremes are related to gender. This finding was supported by Randler (2007) in his meta-analysis of gender differences in morningness/eveningness—he found a weak but significant effect of gender on morningness. Risk taking behavior is another example of sex differences in chronotype; it is positively associated with eveningness in women but not in men (Maestripieri, 2014). Aside from these foundational gender differences, there are other traits, such as conscientiousness, that correlate with morningness regardless of gender (Randler, 2008). Finally, mating strategy—a person's proclivity to short-term or long-term relationships—is positively associated with eveningness in both men and women (Matchock, 2018; Maestripieri, 2014).

Mating Strategies. Maestripieri (2014) provided evidence to suggest that traits associated with eveningness are instrumental in short-term mating strategies in both genders. The author tested the hypothesis that eveningness is positively associated with risk-taking behavior and short-term relationship orientation. She specifically tested—using cortisol profiles from saliva samples—if evening-oriented females were more similar to evening-oriented men than to morning-oriented females. To assess risk-taking behavior, Maestripieri used a self-report measure as well as computerized games to assess financial risk propensity and financial risk

aversion. Participants were also asked their relationship status, and were put into categories of short-term or long-term relationship based on having dated their partner for less or more than six months at the time of testing. Participants were assessed on morningness/eveningness with the *reduced* Morningness Eveningness Questionnaire (MEQ*r*; Adan & Armirall, 1991).

The author found that higher risk-taking was associated with eveningness in women but not in men. Cortisol—not testosterone—mediated risk-taking, and evening-type females had cortisol profiles that were more similar to evening-oriented males than morning-oriented females. It is important to note that risk-taking was measured in terms of finances; this leaves little room for making any conclusions about sexual riskiness or mating strategy. Eveningness was associated with short-term relationship orientation for both men and women, and men and women with evening preferences were more likely to be single than morning-oriented individuals. Based on Maestripieri's findings, the association between financial risk-taking and eveningness is unique to women. The mating behaviors of both men and women who are high in eveningness, on the other hand, are short-term in nature. In evolutionary psychology, short-term mating strategies are often discussed in terms of *fast life history strategies.*

Life History Strategy and the Present Research Proposal

In their chapter on *Life History Theory*, Del Giudice, Gangestad, and Kaplan (2016) explain that no organism can capture and expend unlimited resources. To that end, organisms must allocate resources to certain behaviors; organisms that effectively allocate resources will outcompete organisms that ineffectively allocate resources. *Life history theory*—in Evolutionary Psychology—argues that individuals maximize their fitness by investing time and energy into certain activities and traits. As they invest in some traits, investment in other, incompatible traits

will be reduced. People appraise the stability of their environments early on, and that appraisal will affect the subsequent investments. One fundamental trade-off is between *somatic* (survival) efforts and *reproductive* efforts. People who appraise their environment as safe and stable will delay reproduction and mainly invest in a long life, engaging in long-term mating behaviors. People who appraise their environment as unstable will invest in reproducing at younger ages, anticipating a shorter life, and engaging in short-term mating (Del Giudice, Gangestad, and Kaplan, 2016).

Over time, the investment in different efforts related to survival or reproduction become the individual's *life history strategy*. Life history strategies range from *slow* to *fast*, with survival efforts indicating slow life history strategies and reproductive efforts indicating fast life history strategies. There are several ways that research conceptualizes and measures life history strategy. For example, *Sociosexuality* refers to a person's propensity to engage in sexual behavior and is often conceptualized in terms of restricted or unrestricted *sociosexual orientation*. Linked to short and long-term mating strategies, sociosexuality is related to slow-fast life history strategies, with restricted sociosexuality associated with slow life history strategy, and unrestricted sociosexuality associated with fast life history strategy (Del Giudice, Gangestad, and Kaplan, 2016).

According to Maestripieri (2014) people who have an evening disposition often engage in short-term mating strategies, meaning they are unrestricted in their sociosexuality. It is unsurprising that Marvel-Coen et al. (2018) found eveningness to be associated with fast life history strategy, according to psychosocial variables and cortisol reactivity. Another way to conceptualize life history strategy is *time perspective*. Because people with slow life history strategies invest more in survival efforts, they are more future-oriented than people with fast life

history strategies, investing more energy into future-related goals. Accordingly, Ponzi et al. (2014) found morningness to be related to slow life history strategy; morning-types were more future oriented and less fatalistic than evening types. Further, slow life history strategy and morningness were related to greater compliance with covid-19 guidelines (Li, 2022).

To be unrestricted sociosexually and to have a fast life history strategy requires a positive attitude toward having multiple sexual partners. To that end, it makes sense that people who are sociosexually unrestricted are low in the emotion of disgust as it pertains to sex (Al-Shawaf et al., 2015). The present paper thus proposes that people who are high in eveningness will also be low in *sexual disgust sensitivity.* Because morning-types have slow life history strategies and are more compliant with covid-19 guidelines, the paper also argues that morning-types will be high in *pathogen disgust sensitivity.* It is logical to assume that people who expect a long life will expend more psychological resources on avoiding disease.

Disgust Sensitivity

Disgust. Disgust is an emotion with clear evolutionary origins. In *The Expression of Emotion in Man and Animals,* Charles Darwin provided one of the earliest definitions of disgust: "something revolting, primarily in relation to the sense of taste, as actually perceived or vividly imagined; and secondarily to anything which causes a similar feeling, through the sense of smell, touch, and even of eyesight" (Darwin, p. 213). In their chapter entitled *Disgust*, Rozin, Haidt, and McCauley (RHM) consolidate much of their work on the emotion, providing a comprehensive view of what is widely accepted as a basic emotion (Ekman, 1992): They argue that disgust goes beyond Darwin's definition; it is a complex emotion, elicited by stimuli beyond those which enter the mouth (Rozin, Haidt, & McCauley, 2000). The most widely accepted

theoretical basis for the emotion of disgust, however, is that it is an evolutionary adaptation, a protector from harm and disease (Oaten et al., 2009)—Disgust is a part of our *behavioral immune system* (Schaller & Park, 2011).

Behavioral Immune System and Disgust Sensitivity. The immune system is a set of physiological reactions that protect us from pathogens and disease (Schaller & Park, 2011). An immune response, however, is costly; quite a lot of energy is needed to support immunity. If pathogens are avoided to begin with, it is less likely that we will need to spend energy on an immune response (Schaller & Park, 2011). Disease avoidance mechanisms are known as the *behavioral immune system*—a set of emotional states, cognitive knowledge structures, and behavioral responses that function as a first-line defense against pathogens (Schaller & Park, 2011). For example, many infectious diseases spread through interpersonal interaction. One facet of the behavioral immune system is a decrease in sociality in the presence (or perceived presence) of pathogens. People who think of themselves as more vulnerable to disease are less likely to be extroverted and they are less open to experiences. In other words, people who believe they are at risk of disease perceive social situations as more risky. Further, dirty public bathrooms, coughing strangers, or unkept motel rooms are often viewed as disgusting, and we try to avoid places and people who elicit disgust. Disgust is the primary emotion evoked by the behavioral immune system (Curtis, 2011); People who are high in the emotion of disgust are high in *disgust sensitivity* (Tybur et al., 2009).

Disgust sensitivity refers to individual differences in the feelings and displays of disgust (Haidt et al., 1994). There are many different measures of disgust sensitivity, and nearly all of those measures see disgust sensitivity as a multicomponent concept. In other words, research predominantly suggests that one can be sensitive to certain types of disgust and not others.

Tybur, Lieberman, and Griskevicius, for example, looked at disgust through an evolutionary lens, using factor analysis to propose an elegant, three-domain model of disgust sensitivity that partitions into domains of: pathogens, sexuality, and morality (Tybur et al., 2009).

Preliminary Hypotheses

The present study uses Life History Theory to connect the concepts of morningness/eveningness and disgust sensitivity. Recall that people who are high in morningness have slow life history strategies, are future-oriented, and are more compliant with covid-19 guidelines. Because people who are high in morningness expect a longer life (Ponzi, 2014) and took the pandemic more seriously than evening-types (Li, 2022), I hypothesize (a) that morningness will be positively associated with pathogen disgust sensitivity. Recall that people who are high in eveningness have fast life history strategies and are more sociosexually unrestricted, engaging in short-term mating strategies. Because Al-Shawaf (2015) provided evidence to suggest that people who are sociosexually unrestricted are low in the emotion of disgust as it pertains to sex, I hypothesize (b) that eveningness will be negatively associated with sexual disgust sensitivity.

Secondary Hypotheses

In the above literature review, I discuss a variety of research—in the areas of personality, social, abnormal, and cognitive psychology—that explores morningness/eveningness. I also discuss evolutionary psychology, a unique realm of psychology that overlaps with the previously mentioned areas (Cosmides and Tooby). Recall, for example, Kanazawa (2009) applied an evolutionary lens to cognitive psychology, suggesting that we are evolved to solve problems such

as finding a mate. The following hypotheses seek to use an evolutionary lens to enrich our understanding of how the various theories in psychology explain morningness and eveningness.

Personality and Social Psychology. Randler et al. (2017) used the Big 5 personality measure and found that morningness was predicted by conscientiousness and agreeableness. Ashton and Lee (2007) analyzed these traits through an evolutionary lens, suggesting that conscientiousness and agreeableness are representative of people who are cooperative, altruistic, and forgiving. Based on this information, the present study hypothesizes (c) that morningness will be positively related to *Light Triad* traits: Humanism, Kantianism, and Faith in Humanity. Recall, on the other hand, that evening-types likely suffer from a social jetlag effect that seemingly contributes to their higher level of hostility and aggression than morning-types (Randler and Vollmer, 2014). Because evening-types were found to be more hostile and aggressive, I use the evolutionary lens to hypothesize (d) that eveningness will be positively related to *Dark Triad* traits: subclinical levels of Narcissism, Machiavellianism, and Psychopathy.

Abnormal Psychology. Recall that Akram (2019) found that evening-types may be prone to more psychological symptoms than morning types; a mismatch in sleep preference with the demands of the modern world are likely responsible. Talliard et al. (2021) found specific psychiatric conditions that are associated with eveningness: Attention Deficit Hyperactivity Disorder (ADHD) and mood disorders. Personality disorders, as they relate to eveningness, have been studied less; however, unsurprisingly, eveningness is associated with Borderline Personality Disorder (Lee et al., 2012). Even less research has addressed Borderline *tendencies* in the general population. Measures of borderline tendencies have been used in other evolutionarily focused studies, such as one from our lab looking at ghosting from an evolutionary perspective (Geher et

al., 2019). The present study will use a measure of borderline personality tendencies, predicting (e) that borderline tendencies will be associated with eveningness.

Cognitive Psychology. Research in cognitive psychology has explored morningness and eveningness as they relate to intelligence using measures of IQ, academic achievement, and working memory (Preckel et al., 2011; Kanazawa, 2009). Kanazawa (2009) argued that, from an evolutionary perspective, because eveningness is associated with greater general intelligence, it may be associated with greater mating intelligence. However, while he used this perspective, he used a measure of working memory. The present study will assess mating intelligence using Geher and Kaufman's (2008; 2016) *Mating Intelligence Scale,* predicting that (f) eveningness will be associated with greater mating intelligence. The authors of the Mating Intelligence Scale found in a (2016) validation study that mating intelligence is a separate construct from general intelligence. From an evolutionary psychology framework, this suggests that mating uses a unique, adaptive cognitive system for mating (Geher & Kaufman, 2016).

Methodology

Design

The proposed study will use quantitative methods. Using a correlational design, we will have participants fill out self-report measures to measure the predictors of morningness and eveningness from an evolutionary perspective, particularly focusing on whether disgust sensitivity predicts morningness and eveningness. A series of surveys will be administered to consenting participants via Qualtrics software.

Sample and Procedures

The Qualtrics survey will be sent via email to all psychology majors at a small liberal arts college in upstate New York. Psychology students will be compensated for their participation, receiving research participation credits (SONA). We hope to have a sample size of around 200-300 undergraduates (N=250). Upon opening the survey, participants will be informed that participation is voluntary and they can exit the study at any time while still receiving their SONA credits. Following the informed consent page, participants will fill out demographic questions including age and gender. After filling out the demographics section, participants will move on to complete the following self-report measures: The Morningness/Eveningness Questionnaire (MEQ) (Horne & Ostberg, 1976); the Three Domain Disgust Sensitivity Scale (TDDS) (Tybur et al., 2009); the 12-item Light Triad Scale (LTS) (Kaufman, 2019); the Dark Triad Dirty Dozen (Jonason & Webster, 2010); the Mclean Screening Instrument for Borderline Personality Disorder (MSI-BPD) (Zanerini et al., 2003); and the Mating Intelligence Scale (Geher & Kaufman, 2008; 2016).

Measurement

Morningness/Eveningness Questionnaire (Horne & Ostberg, 1976). To assess morningness and eveningness, the proposed study will use the Horne & Ostberg Morningness/Eveningness Questionnaire (MEQ). The MEQ defines morningness and eveningness by the times of the day in which people feel active and alert. Accordingly, the original study by Horne and Ostberg validated the measure with oral temperature curves, showing that each of the 5 diagnostic categories from the scale—ranging from definitely morning-type to definitely evening-type—was associated with a different peak oral temperature.

Based on this information, they see morningness/eveningness as continuous. The instrument assesses peak alertness and activity times using a variety of questions; for example, when in the day participants would feel most comfortable taking a test. The 19-item questionnaire contains Likert-type and time-scale questions that are assigned with a value of 1-4 or 1-5, respectively. To obtain a global score, each item is totaled and the sum is converted to a 5-point scale: definitely morning type (70–86), moderately morning type (59–69), neither type (42–58), moderately evening type (31–41), and definitely evening type (16–30). Because the scale has good internal reliability (Cronbach's $\alpha = .82$) and validity that is based on biological chronotype, we can use the global score to confidently represent morningness and eveningness in an individual.

Three Domain Disgust Sensitivity Scale (Tybur et al., 2009). The authors of the TDDS explored how people respond to a variety of disgusting situations gathered from previously used measures of disgust in the literature, including the RHM disgust sensitivity scale (Rozin et al., 2000). Tybur and colleagues found that disgust could be divided into three categories: pathogen, sexual, and moral disgust. They created the TDDS, a 21-item self-report measure asking people to rate how disgusted they would be in situations pertaining to pathogen, sexual, and moral disgust on a 7-point Likert-type scale—not disgusting at all (0) to extremely disgusting (7). The authors validated the scale using a measure of *perceived vulnerability to disease* (PVD)—among others—finding that scores on PVD were related to the domains of pathogen and sexual disgust but not moral disgust. Olatunji et al. (2012) further examined the psychometric properties of the instrument, finding high Chronbach's alpha values for the three domains (TDDS-M (α) = .88; TDDS-S (α) = .90; TDDS-P (α) = .85), suggesting good internal reliability. While Otanjali questioned the validity of the moral domain—that showed no convergent or divergent validity when looking at measures of contamination fear and depression, respectively—our hypotheses

concern sexual and pathogen disgust; both were found to have adequate convergent and divergent validity.

12-item Light Triad Scale (Kaufman et al., 2019). This scale assesses "light" prosocial personality traits: Kantianism (e.g., "I don't feel comfortable overtly manipulating people to do something I want"), humanism (e.g., "I tend to applaud the success over people"), and faith in humanity (e.g., "I tend to trust that other people will deal fairly with me")—Chronbach's α = 0.80, .76, and .67, respectively. The scale is scored on a Likert scale of 1-7, where 1 = strongly disagree and 7 = strongly agree. The previously established dark triad—covered in the following section—served as the basis for light triad traits. In the development of the light triad (exploratory factor analysis), the authors used a pool of items that were conceptual opposites of the dark triad items. Importantly, they are not reverse-coded wordings of dark triad items—they are items considered adequate opposites by experts in positive and personality psychology. In the authors' initial development of the scale, it had a high Cronbach's alpha, demonstrating good internal consistency (α = .84); in other words, taken with the evidence above, the Light Triad may serve as a one-dimensional or 3-dimensional construct—the same is true for the dark triad outlined in the following section—and the traits were negatively associated with dark triad traits.

Dark Triad Dirty Dozen (Jonason & Webster, 2010). To measure dark triad personality traits, we will use the Dirty Dozen: a concise measure of the dark triad (Jonason & Webster, 2010). Conceptually based on the work of Paulhus and Williams, the Dirty Dozen defines subclinical levels of Narcissism, Machiavellianism, and Psychopathy as separate but overlapping constructs. In other words, the dark triad Dirty Dozen can serve as a one-dimensional or 3-dimensional construct, and the same goes for the Light Triad, previously discussed. The 12-item Dirty Dozen is more concise than the 91-item original scale developed by Paulhus and

Williams for their initial measure. Again, the scale assesses Machiavellianism (e.g., "I tend to manipulate others to get my way"), narcissism (e.g., "I tend to expect special favors from others"), and psychopathy (e.g., "I tend to lack remorse")—Cronbach's α = .72, .87, .66, respectively. The scale is scored on a Likert scale of 1-7, where 1 = strongly disagree and 7 = strongly agree. To assess convergent and discriminant validity, the authors used the often cited Big Five personality measure: The Dirty Dozen had a core of disagreeableness and was negatively correlated with conscientiousness, a trait that was positively correlated with morningness, as stated in my literature review.

Mclean Screening Instrument for Borderline Personality Disorder (Zanerini et al., 2003). This instrument measures traits predictive of borderline personality disorder (e.g., "I feel chronically empty"). The MSI-BDI (α = .74) is not a diagnostic tool for Borderline Personality Disorder, which is diagnosed in an assessment process (subjective) as opposed to a testing process (objective). However, the authors reported high sensitivity (.81) and high specificity (.85), meaning the test was effective at predicting true positive cases and true negative cases of borderline personality disorder. In other words, this is a good tool to assess borderline *tendencies* in the general population, in accordance with the nature of my hypothesis. The scale is scored on a Likert scale of 1-5, where 1 = strongly disagree and 5 = strongly agree.

Mating Intelligence Scale (Geher & Kaufman, 2016). In 2016, Geher & Kaufman assessed the psychometric properties of their previously developed mating intelligence scale, which they theoretically constructed from the work of Geher and Miller (2008). The measure is split into a male and female version, separated by only the last domain. The domains are cross-sex mind reading—one's ability to sense how the opposite sex feels about them; mating-relevant self deception—maximizing good qualities and minimizing bad qualities to

oneself; mating-relevant other deception—maximizing good qualities and minimizing bad qualities to potential partners; cognitive courtship displays—displaying a prosocial, humorous, and creative cognitions; the last domain for males is sexual overestimation—overestimating a woman's sexual interest; finally, the last domain for females is commitment skepticism—the perception of lacking male commitment as a protective mechanism. Importantly, the authors found that mating intelligence accounted for a significant portion of the variance in mating success—an important validating correlate of mating intelligence—when controlling for age, the Big 5-factor model of personality and general intelligence. In other words, mating intelligence was identified as a unique construct. Cronbach's α was higher for the male scale (.76) than the female scale (.55), so our lab will alter the female domain, hopefully consulting with the Feminist Evolutionary Perspectives Society (FEPS). We will then reassess the internal consistency of the female version of the scale.

Analysis Plan

To assess the relationships between my predictor variable (morningness/eveningness) and my outcome variables (sexual and pathogen disgust sensitivity, light and dark triad, borderline tendencies, and mating intelligence) I will use analysis of variance (ANOVA).

Discussion

The proposed study seeks to better understand sleep chronotype—morningness and eveningness—from an evolutionary perspective. To do so, we look at the main outcome variables of pathogen and sexual disgust sensitivity—evolutionarily based constructs that have been unexplored in how they relate to morningness and eveningness, even though covid-19

compliance and sociosexuality have been discussed. Further, we look at personality from an evolutionary perspective, using Big 5 evidence and Buss-Perry Aggression scale evidence to predict that morningness will be positively related to light triad traits and eveningness will be positively related to dark triad traits. Because our lab has looked at borderline tendencies in the past and eveningness has been associated with impulsivity and mood disorders, we will investigate borderline tendencies as they relate to morningness and eveningness. Finally we will fill the gap in intelligence as it relates to morningness and eveningness by investigating mating intelligence as a correlate.

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