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Sleep-Length, Noctcaelador, and Watching the Night-Sky to Cope

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ABSTRACT - The relationships between an interest in watching the night-sky (noctcaelador), sleep-length, and watching the night-sky as a coping mechanism were explored. Female university students (N = 105) completed the Noctcaelador Inventory, a night-sky related coping scale, and self-reported their habitual sleep-length. The results indicated that individuals reporting less sleep-length also reported higher levels of noctcaelador and watching the night-sky as a coping mechanism. However, noctcaelador and watching the night-sky to cope did not independently account for sleep-length. A factor analysis revealed that noctcaelador and watching the night-sky to cope were statistically indistinguishable. Based on the results it was posited that one function of noctcaelador may be that of a coping mechanism.

Libman, Creti, Amsel, Brender, and Fichten (1997) found that individuals who report decreased sleep-length take-part in a variety of activities (i.e., watching T.V. and reading) during their sleepless nights. These activities appear to at least partly serve as an attempt to cope with not sleeping, or the stress to which sleeplessness is attributed. Indeed, individuals who habitually attain less sleep report more unpleasant experiences than those obtaining more sleep, such as neuroticism (Kumar & Vaidya, 1982) and anxiety (Kumar & Vaidya, 1984). It is likely, therefore, that individuals who habitually obtain less sleep attempt to find ways to cope with their anxiety in addition to merely filling time during sleepless nights.

Coping has been defined as the use of cognitive and behavioral strategies to reduce stress or tension (Lazarus & Folkman, 1984). According to Lazarus and Folkman, coping appears to fall into at least two general categories: problem focused (attempting to find ways to alleviate the stressor) and emotion focused (attempts to calm one's emotional reactions to the stressor).

The typical styles of coping used by individuals has been associated with personality and affective dispositions (Karlsson & Archer, 2007; Watson & Walker, 1996). Therefore, it appears that specific traits may be associated with a tendency to use particular coping mechanisms. These tendencies seem to follow meaningful patterns. For instance, individuals with characteristics of Generalized Anxiety Disorder (GAD) have been found to use less healthy strategies such as avoidance, affective regulation, and hostility-related coping whereas those without GAD characteristics were prone to use more healthy stategies such as seeking social support (Hunt, Simon, & Wisocki, 2007). Similarly, Karlsson and Archer's (2007) findings indicated that "more healthy," affective personalities (high on positive and low on negative affect) were more likley to use constructive cognitive coping as compared to "less healthy" personalities (low positive and high negative affect). Therefore, it is possible that individuals may choose to use particular coping strategies based on their personality dispositions or their available resources (i.e., Thoits, 2006). Recently individual differences have been found in night-sky watching interest and behaviors. Might this also be a disposition which is related to behavior on sleepless nights? For instance, is it possible that individuals with an affinity for night-sky watching might take advantage of the opportunity to watch the night-sky during times of sleeplessness?

Although evidence exists that individuals across many cultures have watched the night-sky for thousands of years (Brecher & Feirtag, 1979), only recently has the psychology of night-sky watching become an area of scientific study. Historically, purposes cited for watching the night-sky have included aesthetic appreciation, cultural and spiritual inspiration, and attaining insight or knowledge (Brashier & Lewis, 2001; Hoskin, 1999; Wyman, 1936). Although the reasons are currently unclear, it seems that watching the night-sky continues to be important to many individuals in contemporary society. For example, a recent study found that 17.8% of a general college student sample endorsed purposefully viewing the night-sky at least once a night (Kelly, Kelly, & Batey, 2006).

In preliminary studies, Kelly (2003) and Kelly and Kelly (2003) used factor analyses to reveal that night-sky watching attitudes and behaviors were influenced by one general factor, or construct. Kelly (2003) termed this construct *noctcaelador* (from Latin: *noct* from nocturnus meaning night, *cael* from caelum meaning

celestial or sky, and *ador* from adorare meaning to worship or adore), and tentatively defined it as an "emotional attachment to, or adoration for, the night-sky" (p. 196). Across several studies, this construct has been associated with variables primarily indicating openness to novel ideas and an interest in intellectual stimulation. One study of interest to the present research included findings of a positive relationship between noctcaelador and a positive-problem-solving orientation and rational-problem-solving approach. A negative relationship was found between noctcaelador and an impulsive, careless style of problem-solving (Kelly, 2005). If one were to compare these problem-solving styles to coping, a positive problem orientation and rational-problem-solving style corresponds to a problem-focused coping style whereas as an impulsive, careless problem-solving style reflects an avoidant coping strategy (D'Zurilla & Chang, 1995).

Also pertinant to the present research was Kelly's (2003) finding that students reported watching the night-sky to be calming and improve mood. Based on Kelly's (2003) findings that night-sky watching improves mood and Kelly's (2005) findings that noctcaelador is associated with a rational problem-solving style, it might be speculated that for individuals with the disposition to enjoy the watching night-sky (those high in noctcaelador), one function of night-sky watching may be to sooth and calm stress and tension (i.e., to cope) and/or somehow facilitate a positive, rational coping style.

Based on the aforementioned findings, it is possible that individuals who report higher levels of noctcaelador and habitually attain less sleep may watch the night-sky as an attempt to cope with difficulties sleeping or concerns which influence their sleeplessness. One previous study provides indirect support for this possibility. Kelly and Rose (2005) found that individuals who reported higher levels of noctcaelador also reported habitually attaining less sleep. The purpose of this study was to examine the relationship between sleep-length and both noctcaelador and watching the night-sky as a coping mechanism. It was predicted that individuals who report habitually attaining less sleep would report higher levels of noctcaelador and watching the night-sky as a coping mechanism.

Method

Participants and Procedure

After obtaining informed consent, 105 females (*M* age = 24.7, *SD* = 7.3) enrolled in undergraduate psychology courses were administered the self-report surveys described below. The majority of the sample (80%) described their ethnicity as (White/Caucasian) while 20% indicated their ethnic background was African American.

Measures

Sleep-Length. Sleep-length estimates were self-reported as a continuous variable by using the method of Kumar & Vaidya (1984), whereby participants were asked to write the number of hours and minutes they habitually sleep in a 24-hour period.

Noctcaelador Inventory (NI). The NI (Kelly, 2004) is a 10-item self-report scale designed to measure psychological attachment to the night sky. Participants respond to items using a 5-point Likert scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." Items are summed to produce a total NI score; higher scores indicate more noctcaelador. Kelly (2004) found the NI to have good internal consistency (α = .92), test-retest reliability (.88, one month), and factorial validity. Further, Batey and Kelly (2005) found support for the criterion validity of the instrument in that astronomical society members scored significantly higher on the NI than controls. A sample item is "I like to go outside and look at the night-sky often."

Night-Sky Coping Scale (NCS). Five items were developed by the authors to assess the extent to which watching the night-sky was used as a coping mechanism. NCS items were as follows: 1. "The night-sky is calming to me," 2. "I usually feel better after looking at the night-sky," 3. "The night-sky is comforting to me," 4. "Looking at the night-sky helps me forget my problems," and 5. "Looking at the night-sky helps me to cope." Participants responded to items using a 5-point Likert scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." Items were summed to produce a total NCS score; higher scores indicated more use of viewing the night-sky as a coping mechanism. An exploratory factor analysis using the current sample found the NCS to measure a single factor accounting for 65% of the variance in responses. All items had factor loadings above .75. These findings provide some preliminary evidence of the construct validity of the scale (Gorsuch, 1983).

Results

Descriptive statistics of the measures used in this study are presented in Table 1. Also presented in Table 1 are zero-order correlations between the measures. As seen in the table, the NI significantly, positively correlated with the NCS and negatively with sleep-length. The NCS significantly, negatively correlated with sleep-length.

To examine the unique relationships of the NI and NCS with sleep-length, partial correlations were calculated. First, the relationship between the NI and sleep-length were examined after controlling the NCS. The result was not significant, r = -.10, p

= .33. Second, the relationship between the NCS and sleep-length were examined after controlling the NI. This result was also not significant, r = -.03, p = .75.

Table 1
Descriptive Statistics and Zero-Order Correlations

	NI	NCS	Sleep-Length
NCS	.83**		
Sleep-Length	-.22*	-.20*	
M	28.3	15.6	7.1
SD	8.1	3.8	1.5
α	.93	.86	--

Note: N = 105. NI = Noctcaelador Inventory; NCS = Night-Sky Coping Scale.
*p < .05 **p < .01

Table 2
Factor Analysis of NI and NCS Items

Item Content	Factor Loading
NI Items	
1. Emotional attachment	.75
2. Mesmerized watching	.76
3. Spend all night watching	.77
4. Watch night-sky often	.74
5. Watching is important to me	.77
6. Find pleasure watching	.77
7. Watching pleases me	.79
8. Feel connected to night-sky	.79
9. Fondness for night-sky	.86
10. Adore objects in night-sky	.81
NCS Items	
1. Night-sky is calming	.73
2. Watching helps me feel better	.79
3. Night-sky is comforting	.80
4. Watching helps me forget problems	.70
5. Watching helps in coping	.70

Note: N = 105. Results are from forcing the extraction of one factor. NI items are available from the first author.

Because of the high correlation between the NI and NCS and their inability to independently predict sleep-length, it was decided to test whether or not the NI and NCS were statistically separable. Hence, NI and NCS items were subjected to an exploratory principal components factor analysis, forcing the extraction of one factor. These results are presented in Table 2. The one extracted factor (eigenvalue = 8.9) accounted for 59% of the variance in responses. All items loaded on the single factor with factor loadings exceeding .70. According to Gorsuch (1983), factors accounting for at least 50% of the variance define a strong factor which likely represents a single underlying construct.

Discussion

The results indicated that, overall, individuals who reported less habitual sleep-length scored higher on noctcaelador and watching the night-sky as a coping mechanism. These results were consistent with the hypothesis and with previous research (Kelly & Rose, 2005). However, statistically, noctcaelador and watching the night-sky as a coping mechanism did not independently predict sleep-length. This result makes some sense considering the factor analysis findings in this study indicating that the NI and NCS tap the same construct. This is consistent with findings that that one underlying factor influences general night-sky watching attitudes and behaviors (Kelly, 2003, 2006; Kelly & Kelly, 2003). Thus, viewing the night-sky as a coping mechanism may be part of the greater construct of noctcaelador and not easily separable. It follows, then, that one function of noctcaelador may be to use viewing the night-sky as a coping mechanism. This finding is consistent with Kelly's (2003) findings which suggested that watching the night-sky was associated with a sense of calmness and improved mood.

From these results it cannot be determined whether watching the night-sky to cope functions as a problem or emotion-focused coping strategy, or perhaps a combination of both. Previous research is contradictory on this point. For instance, Kelly (2003) found that watching the night-sky was calming and soothing, which appears to represent an emotion-focused coping strategy. However, Kelly (2005) found that noctcaelador is related to a rational problem-solving style, which seems to represent a problem-focused coping strategy (D'Zurilla & Chang, 1985). It may be that watching the night-sky assists individuals high in noctcaelador to calm themselves so they may better rationally analyze their stressors and problem-solve. Additional research is needed to examine these possibilities.

The findings of this study have several limitations which should be noted before generalizing the results. For instance, the study was correlational. Thus, no cause-

effect can be assumed. Also, the reliance on self-reported measures may limit our ability to use these findings to predict "real-world" behaviors. The use of only a female sample of college students whose ethnicity was primarily White limits the generalizability of these results to other populations. Finally, the validity of the NCS has not been thoroughly examined. Although factorial valdity of the scale shows promise, it is not known if the scale is an adequate measure of coping by watching the night-sky.

References

Batey, J., & Kelly, W. E. (2005). Criterion-group validity of the Noctcaelador Inventory: Differences between astronomical society members and controls. *Individual Differences Research, 3,* 200-203.

Brashear, R., & Lewis, D. (2001). *Star struck: One-thousand years of the art and science of astronomy*. Seattle: University of Washington Press.

Brecher, K., & Feirtag. M. (Eds.) (1979). *Astronomy of the ancients.* Cambridge, MA: MIT Press.

D'Zurilla, T. J., & Chang, E. C. (1995). The relations between social problem solving and coping. *Cognitive Therapy and Research, 19,* 547-562.

Gorsuch, R. L. (1983). *Factor analysis*. Hillside, NJ: Erlbaum.

Hoskin, M. (Ed.). (1999). *The Cambridge concise history of astronomy*. Cambridge, UK: Cambridge University Press.

Hunt, S. L., Simon, S. L., & Wisocki, P. (2007). An examination of physical health and coping styles associated with symptoms of generalized anxiety. *Psychology Journal, 4,* 15-27.

Karlsson, E., & Archer, T. (2007). Relationship between personality characteristics and affect: Gender and affective personality. *Individual Differences Research, 5,* 44-58.

Kelly, W. E. (2003). Night-sky watching attitudes among college students: A preliminary investigation. *College Student Journal, 37,* 194-196.

Kelly, W. E. (2004). Development of an instrument to measure noctcaelador: Psychological attachment to the night-sky. *College Student Journal, 38,* 100-102.

Kelly, W. E. (2005). Some cognitive characteristics of night-sky watchers: Correlations between social problem-solving, need for cognition, and noctcaelador. *Education, 126,* 328-333.

Kelly, W. E. (2006). Evidence of the existence of noctcaelador across three measures: A factor analytic study. *Journal of Instructional Psychology, 33,* 261-262.

Kelly, W. E., & Kelly, K. E. (2003). Further identification of noctcaelador: An underlying factor influencing night-sky watching behaviors. *Psychology and Education: An Interdisciplinary Journal, 40(3/4),* 26-27.

Kelly, W. E., Kelly, K. E., & Batey, J. (2006). Frequency of college students' night-sky watching behaviors. *College Student Journal, 40,* 166-168.

Kelly, W. E., & Rose, C. (2005). Losing sleep to watch the night-sky: The relationship between sleep-length and noctcaelador. *College Student Journal, 39,* 45-47.

Kumar, A., & Vaidya, A. K. (1982). Neuroticism in short and long sleepers. *Perceptual and Motor Skills, 54*, 962.

Kumar, A., & Vaidya, A. K. (1984). Anxiety as a personality dimension of short and long sleepers. *Journal of Clinical Psychology, 40*, 197-198.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Libman, E., Creti, L., Amsel, R., Brender, W., & Fichten, C. (1997). What do older good and poor sleepers do during periods of nocturnal wakefulness? The Sleep Behaviors Scale: 60+. *Psychology and Aging, 12,* 170-182.

Thoits, P. A. (2006). Personal agency in the stress process. *Journal of Health and Social Behavior, 47,* 309-323.

Watson, D., & Walker, L. (1996). The long-term stability and predictive validity of of trait measures of affect. *Journal of Personalty and Social Psychology, 70,* 567-577.

Wyman, L. C. (1936). Navajo diagnosticians. *American Anthropologist, 38,* 236-246.