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Creativity as a Bridge Between Temperament and Attachment to the Night Sky (Noctcaelador)

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Abstract

Temperament reflects biologically rooted patterns of emotional and behavioral reactivity, yet the mechanisms through which temperament dispositions become specific higher-order experiential orientations remain unclear. This study examined whether creativity mediates the relationship between temperament and noctcaelador – psychological attachment to the night sky. Participants (N = 168) completed the EAS Temperament Survey, Scale of Creative Attributes and Behavior (SCAB), and Noctcaelador Inventory-4. Noctcaelador was positively associated with the SCAB Creative Engagement ($r = .27$, $p < .01$) and Spontaneity ($r = .31$, $p < .01$) scales but showed no direct associations with temperament in correlations or simultaneous regression analyses controlling for age and gender. Parallel mediation models indicated that the EAS Activity scale predicted noctcaelador indirectly through the SCAB Creative Engagement (B = .09, 95% CI [.013, .193]) and Spontaneity (B = .13, 95% CI [.046, .236]) scales. Findings support a process-oriented account in which noctcaelador emerges through the creative modulation of activation rather than direct temperament effects.

Keywords: noctcaelador, temperament, creativity, creative engagement

1. Introduction

Temperament reflects constitutionally rooted patterns of emotional and behavioral reactivity that shape personality development and adaptation across the lifespan (Buss & Plomin, 1984; Rothbart & Bates, 2006). Contemporary models emphasize that temperament is not merely an early childhood descriptor but represents enduring individual differences in reactivity and self-regulation that are elaborated and transformed over time through cognitive, motivational, and regulatory processes (Rothbart et al., 2007; Zentner & Bates, 2008). Core temperamental dimensions include negative emotionality, reflecting sensitivity to distress and arousal, and activity or engagement, reflecting tendencies toward energetic exploration and behavioral output (Larsen & Buss, 2024). The Emotionality–Activity–Sociability (EAS) model of temperament (Buss & Plomin, 1984) specifies these temperamental dispositions to include: Sociability, Activity, Fearfulness, Distress, and Anger. These domains have generally been supported by subsequent longitudinal research (Nærde et al., 2004).

Temperamental dispositions are not inherently adaptive or maladaptive but result in vulnerability or advantage depending on how reactivity is regulated and expressed (Rothbart & Bates, 2006). For instance, emotional sensitivity may facilitate empathy, imagination, and aesthetic responsiveness, while also increasing vulnerability to affective dysregulation (Carr & Nielsen, 2017). Similarly, higher activity levels may promote curiosity, creativity, and engagement with the environment, but may also contribute to

impulsivity or heightened arousal when activation is unmodulated (Carver & White, 1994; Tang et al., 2025). As a result, contemporary personality perspectives emphasize transformational pathways whereby biologically rooted childhood temperamental tendencies are shaped into more differentiated adult patterns of functioning (Gray & McNaughton, 2000).

One important pathway through which temperament may be transformed into relatively adaptive outcomes is creativity. Creativity has been conceptualized not only as a cognitive capacity, but as a dispositional tendency involving engagement, spontaneity, and the flexible integration of affect and cognition (Barron & Harrington, 1981; Feist, 1998). From this perspective, creativity may serve as a regulatory outlet for temperamental activation, allowing emotional and behavioral energy to be channeled into constructive meaning-making, exploration, and aesthetic engagement rather than unmanaged arousal (K. Kelly, 2025). Empirical research supports associations between creativity and temperament-related traits, including activity, sensation seeking, openness to experience, and psychological absorption (Feist, 1998; McCrae, 1994). Creativity has also been linked to impulsive nonconformity, characterized by reduced concern for social convention (Batey & Furnham, 2009), as well as to more adaptive psychological outcomes such as interest-driven engagement and flexible coping (Silvia, 2006).

K. Kelly (2004, 2021) advanced a factor-analytically derived multidimensional model of creativity encompassing engagement in creative endeavors, creative cognitive style, spontaneity, tolerance for divergent ideas, and fantasy. Collectively, these dimensions reflect both cognitive–productive engagement and expressive–experiential processes that support creative thought and behavior. Despite growing interest in creativity as a regulatory and meaning-making process, relatively little research has examined how creativity may link temperament to specific affective–aesthetic orientations toward the natural environment.

Noctcaelador, defined as psychological attachment to the night sky (Kelly, 2003), represents one such orientation. Conceptually, noctcaelador appears to reflect a form of affective–aesthetic engagement characterized by fascination, emotional resonance, and a sense of connection to something larger than oneself. Individuals higher in noctcaelador report more frequent night-sky watching, greater investment in night-sky viewing activities, ownership of viewing equipment, and intentional travel to observe the night sky (Kelly, Kelly, et al., 2006; Tapada et al., 2023). Evidence for noctcaelador's existence has accumulated across methodologies and samples, including quantitative factor-analytic studies supporting its coherence as a distinct individual differences dimension (Kelly, 2004a, 2006) and qualitative investigations documenting its experiential and meaning-oriented features (Blair, 2016). Understanding noctcaelador is important because voluntary engagement with natural environments reflects a pathway through which individuals choose to orient attention, allocate time, and maintain contact with non-instrumental aspects of the world: processes central to personality expression, self-regulation, and everyday behavior.

Noctcaelador has been associated with a range of psychological characteristics, including curiosity (Kelly & Daughtry, 2016), psychological absorption (Kelly, Daughtry, et al., 2006), connection with nature (Barnes & Passmore, 2024), enjoyment of night-time urban environments (Gao & Zhu, 2025), rational and problem-focused cognitive and coping styles (Idris, 2018; Kelly, 2005a; Kelly & Kelly, 2008), and sleep- and arousal-related variables (Kelly, 2025a; Kelly & Rose, 2005). Across studies, noctcaelador has also demonstrated consistent, moderate associations with openness to experience, typically in the .30–.45 range (Kelly, 2004b; Kelly & Kelly, 2010; Kelly, 2025b), suggesting conceptual relatedness without construct redundancy.

A growing body of work further indicates that noctcaelador is meaningfully related to creativity and creativity-adjacent processes, including global creativity (Kelly & Kelly, 2014), fantasy engagement (Kelly & Batey, 2005), awareness of internally generated sensory stimuli (Kelly, 2025c), acceptance of divergent beliefs (Kelly & Daughtry, 2005), artistic interests (Kelly, 2005b, 2021), and aesthetic sensitivity (Kelly, 2008). One empirically supported theoretical account proposes that these associations may reflect aspects of a more permeable or fragmentable self-structure, motivating attachment to stable, emotionally evocative stimuli such as the night sky (Kelly, 2019; Kelly & Daughtry, 2025). An alternative, complementary possibility is that creativity itself functions as a developmental pathway, translating temperamental activation into noctcaelador through engagement and spontaneity rather than fantasy or affective reactivity alone.

Despite previous work linking noctcaelador to personality and creativity, the role of temperament in these associations remains largely unexplored. It remains unclear whether biologically rooted temperamental dispositions directly predict noctcaelador, or whether their influence is indirect, operating through creative processes that shape how activation is expressed. As such, the present study examined whether creativity mediates the relationship between temperament and noctcaelador. To allow for a relatively "pure" approach, all analyses controlled for overlap among temperament dimensions. Based on prior theory and empirical findings, three hypotheses were developed: **(H1)** noctcaelador would be positively associated with creativity facets emphasizing enacted engagement, particularly Creative Engagement and Spontaneity; **(H2)** Temperamental higher Activity would be positively associated with these creativity facets; and **(H3)** Activity would predict noctcaelador indirectly through Creative Engagement and Spontaneity.

2. Methods

2.1. Participants and Procedure

After obtaining informed consent 168 (120 women, 46 men, 2 unidentified) university students enrolled in undergraduate psychology courses at a small university completed the self-report measures described below. The average age of the sample was 24.45 years (SD = 6.49) ranging from 18–48. The study was determined to be nonregulated by the local research ethics board.

2.2. Measures

2.2.1. Temperament. Temperament was measured with the 20-item Emotionality–Activity–Sociability Temperament Survey (EAS; Buss & Plomin, 1984). Participants respond to items using a 1 (Not at all characteristic of me) to 5 (Very characteristic of me) scale. The EAS includes five subscales: Sociability, Activity, Fearfulness (hereafter Fearful), Distress, and Anger. Total scores indicate more of each temperament factor. Adequate psychometrics have been reported (Buss & Plomin, 1984; Nærde et al., 2004).

2.2.2. Creativity. Creativity was assessed using the 20-item Scale of Creative Attributes and Behavior (SCAB; K. Kelly, 2004). Participants responded using a 1 (Strongly disagree) to 7 (Strongly agree) scale. The SCAB includes five subscales: Creative Engagement (hereafter Engagement), Creative Cognitive Style (hereafter Cognitive), Spontaneity, Tolerance, and Fantasy. Total scores indicate more of each factor. Adequate psychometrics have been reported (K. Kelly, 2004, 2016).

2.2.3. Noctcaelador. Noctcaelador was measured using the 4-item version of the Noctcaelador Inventory (Kelly, 2019). Participants responded using a 1 (Strongly disagree) to 5 (Strongly agree) scale. Total scores

indicate more noctcaelador. Adequate psychometrics have been reported (Kelly, 2019).

2.3. Statistical Analysis

Statistical analyses were conducted using SPSS for Windows (Version 30), with significance set at $p < .05$. Gender differences were examined using t-tests. Zero-order Pearson correlations were computed among all study variables. A hierarchical linear regression examined the unique associations between the five EAS temperament dimensions and noctcaelador. Mediation analyses were conducted using Hayes' (2022) PROCESS macro for SPSS (Version 4.2; Model 4), with noctcaelador specified as the outcome variable. Separate models were estimated for each EAS dimension as the focal predictor, controlling for the remaining EAS dimensions, age, and gender, with SCAB subscales entered as parallel mediators. Indirect effects were considered significant when 95% bias-corrected bootstrap confidence intervals (10,000 resamples) did not include zero.

3. Results

Age significantly correlated with EAS Activity ($r = .17$, $p = .028$) and SCAB Fantasy ($r = –.27$, $p < .001$) but not other scales ($rs < .10$, $ps > 191$). Men scored significantly higher than women on SCAB Cognitive, $t(164) = 2.99$, $p = .003$, and Spontaneity, $t(164) = 2.31$, $p = .022$, scales. Women scored significantly higher on EAS Fearful, $t(164) = 3.84$, $p < .001$, and Distress, $t(164) = 2.56$, $p = .011$. No differences were found for other scales, $ts(164) < 1.66$, $ps > 100$. Based on these findings, age and gender were retained as covariates in regression and mediation models.

As shown in Table 1 noctcaelador was not significantly correlated with any EAS scales but was related to three of the five SCAB scales (Engagement, Cognitive, and Spontaneity). Activity was the only EAS scale significantly related to more than one SCAB scale.

Table 1: Correlations of Noctcaelador and Creativity and Temperament factors

	Noctcaelador	Engagement	Cognitive	Spontaneity	Tolerance	Fantasy
Noctcaelador	1.00	0.27**	0.20**	0.31**	0.13	0.14
Sociability	0.01	0.01	– 0.06	0.05	0.16*	– 0.02
Activity	0.02	0.32**	0.22**	0.35**	0.11	– 0.22**
Fearful	– 0.01	– 0.02	– 0.07	– 0.03	– 0.05	0.22**
Distress	0.06	0.06	– 0.02	0.12	– 0.08	0.16*
Anger	– 0.09	0.11	0.06	0.24**	– 0.14	– 0.02

Note: N = 168. *p < .05 **p < .01.

Presented in Table 2, a simultaneous multiple regression including all EAS subscales and demographic covariates revealed no significant direct predictors of noctcaelador. Sociability, Activity, Fearful, and Distress were not uniquely associated with noctcaelador, whereas Anger exhibited a negative trend, though this did not reach significance. Notably, Activity showed a null direct association ($\beta = .00$), indicating that temperamental activation alone is unrelated to noctcaelador. These findings suggest that temperament does not directly account for individual differences in noctcaelador, supporting subsequent mediation analyses examining whether creative processes transmit temperamental influences.

Table 2: Simultaneous Regression Predicting Noctcaelador from EAS Temperament Dimensions			
Variable	**β**	**t**	**p**
Age	.00	0.01	.993
Gender	–.05	0.55	.582
Sociability	.01	0.09	.928
Activity	.00	0.00	1.000
Fearful	–.10	0.88	.380
Distress	.19	1.60	.113
Anger	–.15	1.73	.086

PROCESS mediation models are presented in Table 3. Activity exhibited significant adjusted indirect effects on noctcaelador through Creative Engagement and Spontaneity, whereas indirect effects through Creative Cognitive Style, Tolerance, and Fantasy were not significant. The adjusted direct effect of Activity on noctcaelador was negative and approached statistical significance, consistent with a competitive mediation pattern in which temperamental activation relates to noctcaelador primarily through expressive and engaged forms of creativity rather than via a direct pathway.

In contrast, EAS Fearful and Distress scales did not demonstrate significant adjusted direct or indirect effects, despite their zero-order associations with fantasy-based creativity. Anger showed a significant negative adjusted direct effect on noctcaelador, with no clear adjusted indirect effects via creativity, suggesting that anger proneness independent of other temperament traits is inversely associated with night-sky attachment. Sociability was not associated with noctcaelador either directly or indirectly.

Taken together, these findings indicate that noctcaelador is not broadly related to temperament but rather emerges when specific temperamental tendencies – particularly Activity – are channeled into creative engagement and spontaneous expression.

Table 3: Mediation Models Predicting Noctcaelador from Temperament Via Creative Factors				
SCAB Variable	**B**	**SE**	**LLCI**	**ULCI**
	Sociability Direct effect: B = .02, SE = .09, p = .791			
Engagement	–.01	.04	–.104	.065
Cognitive	–.01	.02	–.057	.031
Spontaneity	.01	.03	–.057	.069
Tolerance	–.01	.02	–.055	.017
Fantasy	.00	.01	–.021	.017
	Activity Direct effect: B = –.21, SE = .11, p = .057			
Engagement	.09	.05	.013	.193
Cognitive	.00	.03	–.057	.072
Spontaneity	.13	.05	.046	.236
Tolerance	–.01	.02	–.052	.027
Fantasy	–.01	.03	–.059	.044
	Fearful			

	Direct effect: B = –.07, SE = .10, p = .505			
Engagement	–.06	.03	–.063	.053
Cognitive	.00	.01	–.019	.022
Spontaneity	–.03	.03	–.091	.044
Tolerance	.00	.01	–.017	.027
Fantasy	.00	.02	–.026	.039
	Distress Direct effect: B = .17, SE = .10, p = .111			
Engagement	–.01	.03	–.062	.053
Cognitive	–.00	.01	–.030	.021
Spontaneity	.01	.04	–.056	.084
Tolerance	.00	.01	–.022	.027
Fantasy	.00	.02	–.025	.041
	Anger Direct effect: B = –.24, SE = .09, p = .008			
Engagement	.01	.02	–.029	.059
Cognitive	.00	.01	–.019	.018
Spontaneity	.06	.03	–.004	.131
Tolerance	.01	.02	–.024	.046
Fantasy	–.00	.01	–.021	.018

4. Discussion

The present study examined whether creativity mediates the relationship between temperament and noctcaelador. Consistent with prior findings (Kelly & Kelly, 2014), noctcaelador showed modest but selective associations with creative attributes, particularly Creative Engagement and Spontaneity. In contrast, temperament traits exhibited little direct association with noctcaelador. Together, these findings support a process-oriented account in which noctcaelador emerges not from temperament alone, but through specific creative pathways that shape how temperamental activation is expressed.

The absence of direct temperament effects suggests that noctcaelador is not reducible to a basic temperamental disposition, aligning with prior work conceptualizing it as a differentiated experiential orientation rather than a direct expression of biologically rooted reactivity (Kelly & Batey, 2005; Kelly, 2019). More broadly, this pattern is consistent with contemporary temperament models emphasizing that biologically based sensitivities are transformed to more specific outcomes through regulatory and meaning-making processes (Rothbart et al., 2007; Zentner & Bates, 2008). From this perspective, temperament may shape vulnerability or activation thresholds, but higher-order experiential orientations such as noctcaelador require intervening processes to emerge.

Although Activity showed no direct association with noctcaelador, it exhibited significant indirect effects through Creative Engagement and Spontaneity. These findings indicate that temperamental activation contributes to noctcaelador when it is channeled into expressiveness and engagement. General activity or energy, in the absence of such modulation, appears insufficient. The presence of positive indirect effects alongside a small negative adjusted direct effect suggests competitive mediation, whereby unchanneled activation may be incompatible with the sustained, receptive attentional stance characteristic of

noctcaelador, whereas creatively organized activation facilitates experiential immersion. Viewed through a regulatory lens, creative engagement and spontaneity appear to modulate temperamental activation, organizing energy and arousal into sustained, receptive experiential engagement rather than unstructured activity or affective reactivity. This interpretation is consistent with personality research indicating that activation supports adaptive outcomes when structured through engagement and meaning rather than externally driven or instrumental action (Barron & Harrington, 1981; Feist, 1998).

The selective role of Spontaneity further suggests that creative nonconformity – characterized by reduced concern for social rules and instrumental goals (Batey & Furnham, 2009) – may lower barriers to what could be solitary, non-instrumental, and aesthetically appreciative activities such as night-sky watching. In this context, prior findings linking noctcaelador to hypomanic-type processes (Kelly, 2025c) may be partly explained by the present results, insofar as elevated activation coupled with spontaneous, expressive modes of engagement may reflect subclinical hypomanic features such as heightened energy, rapid ideation, and reduced behavioral constraint rather than psychopathology per se.

The present findings also extend existing noctcaelador theory by clarifying how temperament-related activation becomes incorporated into noctcaelador rather than merely identifying structural correlates. Prior accounts have emphasized noctcaelador as a hypnotic or self-stabilizing attachment that is more likely to develop among individuals with a flexible or permeable psychic structure, for whom the night sky functions as a predictable and regulating self-object (Kelly, 2019; Kelly & Daughtry, 2025). The current results complement this framework by identifying creative engagement and spontaneity as process mechanisms through which activation is transformed into noctcaelador. Rather than reflecting direct expression of temperament or absorptive-based coping, noctcaelador appears to arise when activation is organized into experiential immersion with a stable external stimulus. This process-based extension helps explain why noctcaelador is consistently associated with openness and absorption (Kelly, 2025b; Kelly, Daughtry et al., 2006) yet remains distinct from temperament and negative emotionality.

Several limitations of the current study warrant consideration. First, the cross-sectional design does not allow causal inference. Longitudinal or developmental designs are needed to determine whether creative engagement precedes the emergence of noctcaelador or vice versa. Second, reliance on self-report measures raises the possibility of shared method variance and response bias (Grimmond et al., 2025), suggesting value in incorporating behavioral, experiential-sampling, or observational indicators of night-sky engagement. Third, the sample was relatively small and consisted of university students. This suggests limitations in statistical power for detecting smaller indirect effects and draws concerns of whether the results reflect the general population. Future research should utilize larger, community samples. Future research also could examine whether impulse regulation, conformity orientation, or indices of self-cohesion moderate the pathway from activation to noctcaelador, and whether similar processes operate for other forms of aesthetic or nature-based attachment. Experimental or diary-based studies manipulating engagement with the night sky would further clarify the regulatory functions proposed here.

In conclusion, the present study indicates that noctcaelador is not a direct expression of temperament, but an emergent experiential orientation shaped by the creative modulation of activation. By identifying creative engagement and spontaneity as mechanisms linking activity to noctcaelador, these findings extend existing models by specifying how dispositional tendencies are transformed into a stabilizing, aesthetically meaningful attachment rather than remaining as undifferentiated reactivity.

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