

Contextual Novelty Modulates the Directionality Between Motivation and Pleasure in Daily Life

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Abstract:

Background: Pleasure comprises anticipatory and consummatory components, and motivation is a key determinant of both. Self-Determination Theory distinguishes intrinsic from extrinsic motivation based on psychological need satisfaction, suggesting they may shape pleasure through distinct mechanisms. Yet whether and how the novelty of everyday contexts modulates these motivation-pleasure relationships remains unknown.

Methods: A sample of 165 participants completed ecological momentary assessments five times daily for 10 days, reporting momentary intrinsic and extrinsic motivation, anticipatory and consummatory pleasure, and contextual novelty (familiar vs. novel) at each assessment ($N = 8,140$).

Results: Intrinsic motivation was a stronger predictor of pleasure than extrinsic motivation across both pleasure components and contexts. Contextual novelty modulated these associations, but only for consummatory pleasure, strengthening the link with intrinsic motivation while weakening the link with extrinsic motivation. Anticipatory pleasure was largely unaffected by novelty and was instead governed by stable individual differences. Time-lagged analyses revealed a bidirectional relationship between intrinsic motivation and anticipatory pleasure that remained stable across contexts.

Conclusions: These findings reveal that pleasure experience is not a uniform response to motivation, but varies as a function of both motivational source and pleasure component. Moreover, this differentiated motivation-pleasure relationship is further shaped by the novelty of everyday contexts. Together, these results advance understanding of when and how motivation translates into pleasure in daily life.

Keywords: motivation; pleasure; ecological momentary assessment; contextual novelty; temporal dynamics

1. Introduction

Pleasure, a key component of emotion, shaping behavior, decisions, and well-being across diverse activities, fluctuates depending on one's psychological state and engagement with the environment (Alexander et al., 2021; Moccia et al., 2018). Central to this dynamic is the human tendency to actively seek pleasure, a premise rooted in Self-Determination Theory (SDT) (Ryan & Deci, 2000). According to SDT, individuals are inherently motivated to pursue experiences that satisfy basic psychological needs for autonomy, competence, and relatedness, thereby engaging in self-exploration and intentional goal pursuit. In this process of active pleasure seeking, motivation becomes a critical driver.

Prior research shows that motivation influences emotional functioning (Hu et al., 2025), and the nature and strength of one's motivation are closely linked to the degree of pleasure experienced in daily activities (Pillny et al., 2020; Wang et al., 2025). Different types of motivation, however, may exert distinct effects. Intrinsic motivation, arising from engagement in personally meaningful or inherently enjoyable activities, supports pleasure especially when autonomy and competence needs are met (Ryan & Deci, 2000), and is associated with favorable outcomes across domains including work performance and emotional well-being (Kuvaas et al., 2017; Zhang et al., 2025). In contrast, extrinsic motivation, driven by external rewards or obligations, may undermine perceived autonomy and produce weaker associations with pleasure (Vecina & Fernando, 2013). Yet the evidence is mixed. Some studies find that extrinsic motivation predicts well-being as well as or better than intrinsic motivation (Pradenas et al., 2021), and under specific conditions, immediate external rewards may even enhance engagement and increase enjoyment and intrinsic interest (Karthik et al., 2025; Liu et al., 2022). Rather than reflecting a genuine theoretical contradiction, these inconsistencies may signal that a critical dimension of the outcome itself has been overlooked.

Specifically, studies examining the motivation-pleasure relationship have largely operationalized pleasure as a broad, undifferentiated construct, without distinguishing between its functionally distinct components. Goal-pursuit frameworks offer a principled

basis for such a distinction. As individuals envision and approach a desired outcome (Beckmann & Heckhausen, 2018), motivation generates anticipatory pleasure through the mental representation of future rewards (Bagozzi & Pieters, 1998); upon attainment, engagement with the actual reward produces consummatory pleasure (Bargh, 2002). These two components are conceptually and empirically distinct. Anticipatory pleasure refers to the enjoyment derived from expecting and approaching a future reward, whereas consummatory pleasure refers to the enjoyment experienced during reward attainment (Gard et al., 2006; Zhou et al., 2024). Evidence from clinical populations further supports this component-specificity. Whereas high amotivation in schizophrenia is associated with reductions in both anticipatory and consummatory pleasure (Da Silva et al., 2017), individuals with schizophrenia spectrum or major depressive disorders show more selective anticipatory impairment relative to healthy controls (Hallford & Sharma, 2019). If motivational influences on pleasure are inherently component-specific, then aggregating across these two components in prior research may have obscured the differential effects of intrinsic and extrinsic motivation. Accordingly, our first research question examines how intrinsic and extrinsic motivation relate differentially to anticipatory and consummatory pleasure in daily life.

Yet even when anticipatory and consummatory pleasure are examined separately, the strength of the motivation-pleasure relationship may not be fixed. The extent to which motivation translates into pleasure may further depend on the context in which activities unfold. Contextual novelty is one such factor that enhances emotional salience and memory (Bench & Lench, 2019; H. Wu et al., 2017), and shapes the fundamental trade-off individuals face in daily life between exploiting familiar routines and exploring novel opportunities (Bagozzi & Pieters, 1998; Barto et al., 2013). While familiar settings stabilize expectations and reduce uncertainty, novelty heightens affective sensitivity and amplifies motivational feedback (S. Becker et al., 2024; Modirshanechi et al., 2023), potentially altering how different types of motivation drive pleasure (Schwartenbeck et al., 2019). Motivation not only sustains engagement but also amplifies both anticipatory and consummatory pleasure (Carruthers, 2024; Schultz, 2023), and pleasurable outcomes in

turn reinforce motivation and sustain future goal pursuit (D. Becker et al., 2024). Critically, because intrinsic and extrinsic motivation differ in their underlying need-satisfaction processes and sensitivity to environmental cues, the moderating effect of novelty on these motivation-pleasure associations may not operate uniformly across motivation types or pleasure components. Whether and how contextual novelty moderates the motivation-pleasure relationship as a function of motivation type and pleasure component, and how these dynamics unfold over time, constitutes our second research question.

To examine these questions, Ecological Momentary Assessment (EMA) offers a methodologically rigorous approach. By repeatedly sampling psychological states as individuals move through their daily lives, EMA captures the naturalistic context in which motivation and pleasure unfold, including whether each activity is familiar or novel, while minimizing recall bias and enhancing ecological validity (Mengelkoch et al., 2023; Roczniowska et al., 2020; Shiffman et al., 2008). Indeed, EMA has been used to track momentary anticipatory and consummatory pleasure as well as motivational states in daily life (Edwards et al., 2018; Merchant et al., 2023). The repeated, nested structure of EMA data enables multilevel modeling, which separates within-person fluctuations from between-person differences. It also supports time-lagged analyses, which can reveal bidirectional associations between motivation and pleasure over time and whether these dynamics differ across familiar and novel contexts (Kuppens et al., 2012) and to examine how positive and negative emotions predict subsequent behavioral outcomes (Emery et al., 2023). Applying this approach allows us to capture how motivation and pleasure influence one another over time and whether this dynamic differs across familiar and novel contexts.

To address these research questions within a single naturalistic framework, we conducted a 10-day EMA study in which participants reported intrinsic and extrinsic motivation alongside anticipatory and consummatory pleasure at each assessment, and indicated whether activities occurred in familiar or novel contexts. Three-level multilevel models accounted for momentary, daily, and between-subject variance, with contextual novelty specified as a within-person moderator. Time-lagged multilevel models further examined bidirectional associations between motivation and pleasure across familiar and novel

contexts. Together, these analytical approaches allow us to examine motivation and pleasure not as static constructs, but as dynamic processes shaped by the contexts of everyday life.

2. Methods

2.1. Participants

G*Power 3.1 (Faul et al., 2009) indicated that $N = 144$ was sufficient to detect a medium effect size ($f = 0.15$) at $\alpha = 0.05$ and $power = 0.80$. We recruited 172 participants from a university in China for a 10-day ecological momentary assessment (EMA) study conducted between April and November 2023. Participants received performance-based compensation (50–60 RMB). Seven participants were excluded for low adherence (<20% prompts). The final sample included 165 participants (135 females, 30 males; $M_{age} = 19.89$ years, $SD = 0.66$) providing 8,140 valid reports. The study was approved by the institutional ethics committee.

2.2. Ecological Momentary Assessment

Participants completed a 10-day EMA (5 prompts/day, 8:00 AM–10:00 PM). At each prompt, activities were categorized as familiar (routine) or novel (exploratory). Participants completed visual analog scale (0–100) ratings assessing extrinsic motivation (the extent to which they engaged in the activity to achieve a specific goal), intrinsic motivation (the extent to which they engaged in the activity because it was interesting or enjoyable), and consummatory pleasure (indexed by ratings of enjoyment, interest, and increased happiness following activity completion). Additionally, participants specified whether novel activities were newly explored and forecasted their anticipated pleasure for the subsequent three hours. This design bridges exploration-exploitation frameworks with real-time behavioral tracking to examine how situational novelty modulates motivation-pleasure dynamics in daily life.

2.3. Questionnaires

To account for individual differences, participants completed baseline assessments of pleasure sensitivity, exploratory tendencies, and affective symptoms. Pleasure sensitivity was measured via the Snaith-Hamilton Pleasure Scale (SHAPS) (Snaith et al., 1995) for general hedonic capacity and the Temporal Experience of Pleasure Scale (TEPS, Chinese version) (Chan et al., 2012), which distinguishes between anticipatory and consummatory pleasure across abstract and contextual dimensions. Motivational and exploratory tendencies were assessed using the Exploration Behavior Scale (Green & Campbell, 2000) and the Behavioral Inhibition/Activation System Scale (BIS/BAS) (Carver & White, 1994). Finally, the GAD-7 and BDI were employed to measure anxiety and depressive symptoms, respectively.

2.4. Data Analysis

All analyses were conducted in R (v 4.4.2). We employed three-level linear mixed-effects modeling to account for the hierarchical structure of the EMA data. Prior to estimation, all continuous predictors were person-mean centered to facilitate interpretation and reduce multicollinearity. Correlation analyses and variance inflation factors ($VIFs < 2$) confirmed no significant multicollinearity concerns among predictors.

2.4.1 Examining How Motivation Predicts Momentary Pleasure

To examine how intrinsic and extrinsic motivation predict momentary pleasure (both anticipatory and consummatory), we fitted three-level linear mixed-effects models (LMMs) using the lme4 package in R (Bates et al., 2015), with measurement occasions (Level 1) nested within days (Level 2) and days nested within subjects (Level 3). Random intercepts for day and subject were included to account for within-subject variability over time. In all equations, subscripts i, j , and k denote the measurement occasion, day, and individual, respectively; T represents the outcome variable; π denotes level-specific intercepts and slopes; β and γ represent day- and person-level coefficients; and ε , ν , and μ are residual terms at each respective level. Exemplar equations are as follows:

$$T_{ijk} = \pi_{0jk} + \pi_{1jk} \times \text{Motivation}_{ijk} + \varepsilon_{ijk}, \text{ (Equation 1)}$$

Here, represents momentary pleasure for individual k at time i on day j , and ε_{ijk} is the residual.

$$\pi_{0jk} = \beta_{00j} + v_{0jk}, \text{ (Equation 2)}$$

At the Level 2 (*day level*, Equation 2), captures day-level deviations within individuals.

$$\begin{aligned} \beta_{00j} = & \gamma_{000} + \gamma_{001} \times \text{Temporal Experience of Pleasure}_k + \gamma_{002} \times \text{Hedonic Capacity}_k + \\ & \gamma_{003} \times \text{Trait Exploratory Behavior}_k + \gamma_{004} \times \text{Behavioral Inhibition/Activation}_k + \\ & \gamma_{005} \times \text{Anxiety}_k + \gamma_{006} \times \text{Depression}_k + \mu_{00k}, \text{ (Equation 3)} \end{aligned}$$

At the Level 3 (Equation 3) γ_{000} denotes the grand mean, and μ_{00k} represents between-subject variability. Subject-level covariates included Temporal Experience of Pleasure, Hedonic Capacity, Trait Exploratory Behavior, Behavioral Inhibition/Activation, Anxiety, and Depression.

2.4.2. Testing the Moderating Role of Context

To examine whether contextual novelty moderates the association between motivation and pleasure, cross-level interaction terms were added to the model. Context (0 = familiar, 1 = novel) was dummy-coded and interacted with both intrinsic and extrinsic motivation:

$$\begin{aligned} T_{ijk} = & \pi_{0jk} + \pi_{1jk} \times \text{Motivation}_{ijk} + \pi_{2jk} \times \text{Context}_{ijk} + \pi_{3jk} (\text{Motivation}_{ijk} \times \text{Context}_{ijk}) + \\ & \varepsilon_{ijk}, \text{ (Equation 4)} \end{aligned}$$

The interaction term β_3 captures whether the strength of the motivation–pleasure relationship differs between familiar and novel contexts. To further interpret significant interactions, simple slopes analyses were conducted using the *emmeans* package (Lenth, 2017), estimating the effects of motivation separately in familiar and novel contexts. Differences between slopes were tested using z-tests, with p-values corrected using the false discovery rate (FDR) procedure.

2.4.3. Investigating the Reciprocal Dynamics Between Motivation and Pleasure Over Time

To examine temporal and reciprocal relationships between motivation and pleasure, we conducted time-lagged LMMs within the same three-level structure. Specifically, we predicted outcomes at time $t + 1$ from predictors at time t , while controlling for autoregressive effects. A representative model is shown below:

$$AP_{t+1,ijk} = \pi_{0jk} + \pi_{1jk} \cdot Motivation_{t,ijk} + \pi_{2jk} \cdot AP_{t,ijk} + \varepsilon_{ijk}, \text{ (Equation 5.1)}$$

$$Motivation_{t+1,ijk} = \pi_{0jk} + \pi_{1jk} \cdot AP_{t,ijk} + \pi_{2jk} \cdot Motivation_{t,ijk} + \varepsilon_{ijk}, \text{ (Equation 5.2)}$$

Pleasure_{ijk} is included as an autoregressive term. Parallel models were estimated in the reverse direction, predicting motivation at time $t + 1$ from prior pleasure.

3. Results

3.1 Descriptive Results, Variance Decomposition, and Intercorrelations

Extrinsic motivation and intrinsic motivation exhibited robust positive correlations with consummatory pleasure ($r = 0.36, p < 0.001$; $r = 0.80, p < 0.001$) and anticipatory pleasure ($r = 0.28\text{--}0.46, p < 0.001$). Notably, consummatory and anticipatory pleasure demonstrated substantial covariance across contexts ($r = 0.48, p < 0.001$ in familiar context; $r = 0.45, p < 0.001$ in novel context) (Table 1), reflecting shared variance in pleasure experience.

Variance decomposition revealed pronounced within-person variability in extrinsic motivation and pleasure, as indexed by moderate intraclass correlation coefficients (ICC_1) for extrinsic motivation (0.49–0.56) and intrinsic motivation (0.47–0.59). In contrast, between-person variability ($ICC_3 = 0.35\text{--}0.47$) and day-level fluctuations ($ICC_2 = 0.05\text{--}0.12$) were relatively attenuated, suggesting stable within-subject associations between motivational orientations and emotional outcomes across contexts.

Hedonic capacity showed a robust negative association with depressive symptoms ($r = -0.47, p < 0.001$) and a non-significant positive trend with anxiety ($r = 0.12, p < 0.14$). These covariates were retained in subsequent analyses to control for subject-level

confounding. Multicollinearity diagnostics yielded variance inflation factors ($VIFs = 1.04–2.55$), well below the threshold of 5, confirming the absence of problematic collinearity.

Insert Tabel 1 here.

3.2. Hierarchical Models Predicting Momentary Pleasure: Main Effects and Contextual Moderation

3.2.1. Primary Associations Between Motivation and Pleasure

In the novel context, both extrinsic motivation and intrinsic motivation at time t significantly predicted higher levels of pleasure. Specifically, extrinsic motivation positively predicted consummatory ($b = 0.19, SE = 0.01, p < 0.001$) and anticipatory pleasure ($b = 0.09, SE = 0.01, p < 0.001$). Intrinsic motivation was also significantly associated with consummatory pleasure ($b = 0.67, SE = 0.01, p < 0.001$) and anticipatory pleasure ($b = 0.15, SE = 0.01, p < 0.001$) (Table 2).

Insert Table 2 here.

In the familiar context, similar patterns emerged. Extrinsic motivation significantly predicted consummatory ($b = 0.22, SE = 0.01, p < 0.001$) and anticipatory pleasure ($b = 0.08, SE = 0.01, p < 0.001$). Intrinsic motivation was again significantly associated with both consummatory ($b = 0.63, SE = 0.01, p < 0.001$) and anticipatory pleasure ($b = 0.13, SE = 0.01, p < 0.001$).

3.2.2. Moderating Role of the Contextual Novelty

As shown in Table 3, contextual novelty moderated the relationship between motivation and pleasure, although the magnitude and direction of this moderation varied across motivation type and pleasure components.

For consummatory pleasure, extrinsic motivation ($b = 0.21, SE = 0.01, p < 0.001$) and context ($b = 1.81, SE = 0.24, p < 0.001$) both showed significant main effects. The interaction between extrinsic motivation and context was significant and negative ($b = -0.04, SE = 0.01, p < 0.01$), indicating that the positive association between extrinsic motivation and consummatory pleasure was weaker in novel contexts than in familiar

contexts. However, fixed effects explained only 3.8% of the variance ($R^2_{\text{marginal}} = 0.038$), suggesting that the moderating effect was relatively modest.

A stronger pattern emerged for intrinsic motivation. Intrinsic motivation ($b = 0.58$, $SE = 0.01$, $p < 0.001$) significantly predicted consummatory pleasure, while context showed a small negative main effect ($b = -0.54$, $SE = 0.19$, $p < 0.01$). The interaction between intrinsic motivation and context was positive and significant ($b = 0.05$, $SE = 0.01$, $p < 0.001$), with fixed effects explaining 27% of the variance ($R^2_{\text{marginal}} = 0.27$, $R^2_{\text{conditional}} = 0.67$), representing a substantially larger effect than that observed for extrinsic motivation. This finding indicates that contextual novelty strengthened the association between intrinsic motivation and consummatory pleasure, whereas it weakened the association between extrinsic motivation and consummatory pleasure.

Insert Table 3 here.

For anticipatory pleasure, both extrinsic motivation ($b = 0.05$, $SE = 0.01$, $p < 0.001$) and intrinsic motivation ($b = 0.09$, $SE = 0.01$, $p < 0.001$) showed significant positive main effects. Context exerted a small negative effect in the intrinsic motivation model ($b = -0.49$, $SE = 0.18$, $p < 0.01$) but was not significant in the extrinsic motivation model ($b = -0.24$, $SE = 0.18$, $p = 0.187$). The interaction between extrinsic motivation and context was not significant ($b = 0.01$, $SE = 0.01$, $p = 0.244$). Although the interaction between intrinsic motivation and context reached statistical significance ($b = 0.02$, $SE = 0.01$, $p < 0.05$), fixed effects explained less than 1% of the variance ($R^2_{\text{marginal}} = 0.004$ and 0.009 , respectively), with individual differences accounting for the majority of explained variance ($R^2_{\text{conditional}} \approx 0.60$). These findings suggest that contextual novelty had only a limited influence on the relationship between motivation and anticipatory pleasure.

Taken together, contextual novelty exerted its strongest moderating influence on consummatory pleasure. Specifically, novelty enhanced the positive association between intrinsic motivation and consummatory pleasure while attenuating the association between extrinsic motivation and consummatory pleasure. In contrast, the moderating effects of contextual novelty on anticipatory pleasure were weak or absent, indicating that contextual

novelty primarily shapes pleasure experienced during activity engagement rather than pleasure anticipated before engagement.

3.2.3. Post Hoc Analyses: Simple Slope Comparisons

Simple slopes analyses were conducted to clarify the nature of the significant interactions between motivation and contextual novelty. For anticipatory pleasure, extrinsic motivation significantly predicted pleasure in both familiar ($b = 0.06$, $SE = 0.01$, $p < 0.001$) and novel contexts ($b = 0.07$, $SE = 0.01$, $p < 0.001$), though the difference between slopes was not statistically significant ($p = 0.27$). In contrast, intrinsic motivation was positively associated with anticipatory pleasure in both familiar ($b = 0.09$, $SE = 0.01$, $p < 0.001$) and novel contexts ($b = 0.11$, $SE = 0.01$, $p < 0.001$), with a significantly stronger association in the novel context ($p = 0.02$). These relationships can be visually confirmed in Figure 1, where the moderating effect of contextual novelty is clearly depicted.

For consummatory pleasure, extrinsic motivation again showed significant positive associations in both contexts—familiar ($b = 0.21$, $SE = 0.01$, $p < 0.001$) and novel ($b = 0.18$, $SE = 0.01$, $p < 0.001$)—with a significantly stronger effect in the familiar context ($p = 0.01$). Intrinsic motivation exhibited an even larger difference, predicting consummatory pleasure more strongly in the novel ($b = 0.64$, $SE = 0.01$, $p < 0.001$) than in the familiar context ($b = 0.60$, $SE = 0.01$, $p < 0.001$; p for slope difference < 0.001). Again, Figure 1 provides a clear visual representation of these interactions, illustrating how the effects of both extrinsic and intrinsic motivation on consummatory pleasure vary depending on the context.

Insert Fig 1 here.

3.3. Temporal Dynamics of Motivation-Anticipatory Pleasure Linkages

Time-lagged analyses uncovered cross-contextually stable bidirectional relationships between intrinsic motivation and anticipatory pleasure. In novel contexts, intrinsic motivation at time t significantly predicted higher levels of anticipatory pleasure at time $t+1$ ($b = 0.05$, $SE = 0.01$, $p < 0.001$). Reciprocally, anticipatory pleasure at time t also predicted increased intrinsic motivation at time $t+1$ ($b = 0.14$, $SE = 0.01$, $p < 0.001$). These findings

indicate bidirectional temporal coupling between intrinsic motivation and affective forecasting in novel contexts, which is illustrated in Figure 2A.

In familiar contexts, a similarly bidirectional pattern emerged: intrinsic motivation at time t significantly predicted anticipatory pleasure at time $t+1$ ($b = 0.10$, $SE = 0.01$, $p < 0.001$), and anticipatory pleasure at time t also predicted subsequent intrinsic motivation at time $t+1$ ($b = 0.05$, $SE = 0.01$, $p < 0.001$) (Figure 2B). Together, these findings suggest that the reciprocal reinforcement between intrinsic motivation and anticipatory pleasure operates robustly regardless of contextual novelty.

Insert Fig 2 here.

4. Discussions

This study investigated how motivation shapes pleasure experience across familiar and novel contexts in daily life. Three key findings emerged: intrinsic motivation robustly predicted greater pleasure than extrinsic motivation across contexts; contextual novelty differentially moderated consummatory but not anticipatory pleasure; and intrinsic motivation maintained a stable bidirectional relationship with anticipatory pleasure regardless of contextual variation. Together, these results suggest that the translation of motivation into pleasure depends on a confluence of who is motivated, how they are motivated, and what component of pleasure experience is considered.

Both intrinsic and extrinsic motivation positively predicted pleasure across contexts, with intrinsic motivation showing stronger associations for both anticipatory and consummatory components of pleasure. This aligns with SDT (Ryan & Deci, 2000), which holds that intrinsically motivated activities satisfy basic psychological needs for autonomy and competence, thereby generating immediate and sustained affective rewards. Such benefits likely arise because intrinsic pursuits integrate personal values with both the process and outcomes of action, supporting self-concordant engagement (Ehrlich, 2023; Ehrlich et al., 2024). Although extrinsic motivation also showed reliable positive associations with pleasure, its comparatively smaller effect sizes are consistent with SDT's proposition that external goal pursuit tends to undermine perceived autonomy, reducing the felt satisfaction

of engagement even when external outcomes are achieved. This contrast highlights that it is not motivation per se, but its underlying regulatory source, that determines the magnitude of hedonic returns in daily life. Notably, this finding partially reconciles prior inconsistencies in the literature: although some studies have reported comparable or even superior well-being outcomes for extrinsic motivation under specific conditions (Karthik et al., 2025; Pradenas et al., 2021), the present results suggest that such effects may reflect context-specific exceptions rather than a general equivalence between motivation types, with intrinsic motivation consistently yielding stronger hedonic returns when momentary experience is assessed in naturalistic settings. This pattern is consistent with broader psychoradiological perspectives, which emphasize extending affective science from explaining clinical dysfunction to understanding adaptive variability in everyday emotional functioning (T. Wu & Yuan, 2026).

Contextual novelty differentially moderated the motivation-pleasure relationship depending on motivation type. Novel contexts strengthened the association between intrinsic motivation and consummatory pleasure. This is consistent with evidence that novelty activates dopaminergic reward signaling and enhances intrinsic interest (Bunzeck et al., 2012; Modirshanechi et al., 2023), and may reflect a deeper psychological affinity between novelty and intrinsic motivation: both orient individuals toward exploratory engagement driven by curiosity and personal interest, such that novel contexts amplify rather than disrupt the conditions under which intrinsic motivation generates pleasure. In contrast, extrinsic motivation depends on predictable external outcomes; novel contexts reduce outcome predictability, disrupting the instrumental conditions under which external incentives generate hedonic returns (Bardach & Murayama, 2025). This disruption may operate through reduced incentive salience: when environmental unpredictability diverts attentional resources toward orienting responses, the motivational pull of external rewards becomes less perceptually prominent, weakening their capacity to sustain pleasurable engagement. The opposite directions of these moderating effects reveal that contextual novelty does not uniformly amplify motivation's affective benefits but instead acts as a

differential filter: selectively potentiating pleasure for those motivated by internal interest while attenuating it for those driven by external contingencies.

Notably, these moderating effects were confined to consummatory rather than anticipatory pleasure, revealing a stage-specific role of context in hedonic processing. The substantially larger variance explained in consummatory pleasure ($R^2_{\text{marginal}} = 0.27$) relative to anticipatory pleasure ($R^2_{\text{marginal}} < 0.01$), alongside the dominance of stable individual differences in the latter ($R^2_{\text{conditional}} \approx 0.60$), indicates that consummatory pleasure is shaped by real-time contextual experience, whereas anticipatory pleasure is primarily governed by stable dispositional tendencies accumulated through prior reward history. This dissociation aligns with theoretical distinctions between the present-focused 'liking' system, which is sensitive to real-time environmental input, and the forward-looking 'wanting' system, which relies on internalized reward representations built from past experience and is therefore less susceptible to momentary contextual shifts (Berridge, 2023; Berridge & Kringelbach, 2015). The present findings thus provide ecologically grounded evidence that the two components of pleasure experience are not merely temporal variants of the same process but are regulated through fundamentally different mechanisms. Notably, whereas prior evidence for this dissociation has largely emerged from clinical populations characterized by motivational deficits, the present findings demonstrate that component-specific hedonic regulation is also observable within the motivational variability of healthy daily life, suggesting that the anticipatory-consummatory distinction reflects a fundamental feature of hedonic architecture rather than a marker of psychopathology.

Time-lagged analyses revealed a stable bidirectional relationship between intrinsic motivation and anticipatory pleasure across both novel and familiar contexts, suggesting a reciprocal reinforcement process in which intrinsically motivated engagement generates positive affective forecasts that in turn sustain motivational states over time (Bunzeck et al., 2012; Petzke & Schomaker, 2022). Critically, this cross-contextual stability contrasts with the context-dependent moderation observed for consummatory pleasure, further supporting a functional dissociation between anticipatory and consummatory components of pleasure. The context-independence of this reciprocal process suggests that intrinsic motivation

functions as an adaptive motivational resource: by sustaining forward-looking pleasure experience regardless of whether the surrounding environment is familiar or novel, it enables individuals to maintain goal-directed engagement across the varied and unpredictable contexts of daily life. These effects were limited to lag-1, indicating that this reinforcement process operates on a relatively short timescale, consistent with the rapid motivational updating characteristic of everyday goal pursuit.

Several limitations warrant consideration in interpreting the present findings. First, the fixed-interval design prompted participants five times daily regardless of whether motivationally significant events had occurred. Because hedonic peaks are often tied to specific goal-relevant moments rather than evenly distributed across the day, this approach may undersample highly affectively salient episodes while overrepresenting motivationally neutral states, potentially attenuating observed motivation–pleasure associations. Event-contingent sampling may better capture the hedonic dynamics targeted in this study. Second, repeated prompting may itself function as an external regulatory cue, potentially shifting motivational orientation away from intrinsic engagement toward compliance with the study protocol. If intrinsic motivation was systematically dampened, observed associations may underestimate those occurring in naturalistic, unprompted contexts. This is a particular concern in EMA research on intrinsic motivation, where measurement procedures may inadvertently influence the construct under study. Third, novelty was assessed using a binary self-report measure, which likely conflates perceptual, cognitive, and affective components and may obscure which aspects of novelty drive the observed moderation effects on pleasure. Fourth, the predominantly female sample limits generalizability, particularly given evidence for gender differences in reward sensitivity and motivational orientation (Zahn et al., 2009), underscoring the need for replication in more balanced samples. Collectively, these limitations suggest that future work should adopt finer-grained sampling and measurement approaches to more precisely capture how motivational processes translate into momentary pleasure across contexts.

Despite these limitations, these findings advance understanding of affective regulation by demonstrating both stable motivational effects and differential contextual modulation of

pleasure experience. Cultivating intrinsic, self-endorsed goals may therefore serve as a relatively robust emotional resource across varying environmental conditions, from stable routines to unfamiliar challenges. Practically, these findings suggest that well-being interventions and motivational coaching may benefit from considering not only whether individuals are motivated, but also the source of that motivation and the specific component of pleasure experience being targeted: fostering intrinsic engagement may be particularly relevant for sustaining anticipatory pleasure and supporting adaptive motivational dynamics, whereas contextual novelty may play a more prominent role in shaping consummatory pleasure.

5. Conclusions

This study reveals that motivation and pleasure are linked through both stable and context-sensitive pathways. Intrinsic motivation functioned as a robust affective resource, predicting greater pleasure across contexts and maintaining a stable reciprocal reinforcement process with anticipatory pleasure independent of environmental novelty. Contextual novelty, by contrast, selectively reshaped consummatory pleasure in opposing directions depending on motivation type, while leaving anticipatory pleasure largely intact. Together, these insights advance understanding of affective resilience and offer a more precise framework for designing interventions that target motivation and pleasure across the varied contexts of everyday life.

Declaration of Interest Statement:

The authors declare that there is no conflict of interest with respect to the research, authorship, and/or publication of this article.

Informed Consent:

Informed consent was obtained from all participants prior to their participation in the study.

Ethics Approval:

All procedures were approved by the Biomedical Ethics Committee of Southern Medical University, China, where the research was conducted (Approval No. 2022-47). The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and its later amendments or comparable ethical standards.

Data Availability:

De-identified datasets, EMA survey instruments, and analysis scripts supporting the findings of this study are available from the corresponding author upon reasonable request. These materials were made available to the editors and reviewers during the peer review process to facilitate evaluation and reproducibility.

Reference

- Alexander, R., Aragón, O. R., Bookwala, J., Cherbuin, N., Gatt, J. M., Kahrilas, I. J., Kästner, N., Lawrence, A., Lowe, L., Morrison, R. G., Mueller, S. C., Nusslock, R., Papadelis, C., Polnaszek, K. L., Helene Richter, S., Sifton, R. L., & Styliadis, C. (2021). The neuroscience of positive emotions and affect: Implications for cultivating happiness and wellbeing. *Neuroscience & Biobehavioral Reviews*, 121, 220–249. <https://doi.org/10.1016/j.neubiorev.2020.12.002>
- Bagozzi, R. P., & Pieters, R. (1998). Goal-directed Emotions. *Cognition & Emotion*, 12(1), 1–26. <https://doi.org/10.1080/026999398379754>
- Bardach, L., & Murayama, K. (2025). The role of rewards in motivation—Beyond dichotomies. *Learning and Instruction*, 96, 102056. <https://doi.org/10.1016/j.learninstruc.2024.102056>
- Bargh, J. A. (2002). Losing Consciousness: Automatic Influences on Consumer Judgment, Behavior, and Motivation. *Journal of Consumer Research*, 29(2), 280–285. <https://doi.org/10.1086/341577>
- Barto, A., Mirolli, M., & Baldassarre, G. (2013). Novelty or Surprise? *Frontiers in Psychology*, 4.

- <https://doi.org/10.3389/fpsyg.2013.00907>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1). <https://doi.org/10.18637/jss.v067.i01>
- Becker, D., Bernecker, K., Guobyte, A., & Ganama, D. (2024). ‘Pleasureful self-control’? A new perspective on old problems. *Current Opinion in Psychology*, 60, 101888. <https://doi.org/10.1016/j.copsyc.2024.101888>
- Becker, S., Modirshanechi, A., & Gerstner, W. (2024). Computational models of intrinsic motivation for curiosity and creativity. *Behavioral and Brain Sciences*, 47, e94. <https://doi.org/10.1017/S0140525X23003424>
- Beckmann, J., & Heckhausen, H. (2018). Motivation as a Function of Expectancy and Incentive. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation and Action* (pp. 163–220). Springer International Publishing. https://doi.org/10.1007/978-3-319-65094-4_5
- Bench, S. W., & Lench, H. C. (2019). Boredom as a seeking state: Boredom prompts the pursuit of novel (even negative) experiences. *Emotion*, 19(2), 242–254. <https://doi.org/10.1037/emo0000433>
- Berridge, K. C. (2023). Separating desire from prediction of outcome value. *Trends in Cognitive Sciences*, 27(10), 932–946. <https://doi.org/10.1016/j.tics.2023.07.007>
- Berridge, K. C., & Kringelbach, M. L. (2015). Pleasure Systems in the Brain. *Neuron*, 86(3), 646–664. <https://doi.org/10.1016/j.neuron.2015.02.018>
- Bunzeck, N., Doeller, C. F., Dolan, R. J., & Duzel, E. (2012). Contextual interaction between novelty and reward processing within the mesolimbic system. *Human Brain Mapping*, 33(6), 1309–1324. <https://doi.org/10.1002/hbm.21288>
- Carruthers, P. (2024). The New Hedonism. In P. Carruthers, *Human Motives* (1st ed., pp. 40–63). Oxford University PressOxford. <https://doi.org/10.1093/oso/9780198906131.003.0003>
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, 67(2), 319–333. <https://doi.org/10.1037/0022-3514.67.2.319>
- Chan, R. C. K., Shi, Y., Lai, M., Wang, Y., Wang, Y., & Kring, A. M. (2012). The Temporal Experience of Pleasure Scale (TEPS): Exploration and Confirmation of Factor Structure in a Healthy Chinese Sample. *PLoS ONE*, 7(4), e35352. <https://doi.org/10.1371/journal.pone.0035352>
- Da Silva, S., Saperia, S., Siddiqui, I., Fervaha, G., Agid, O., Daskalakis, Z. J., Ravindran, A., Voineskos, A. N., Zakzanis, K. K., Remington, G., & Foussias, G. (2017). Investigating consummatory and anticipatory pleasure across motivation deficits in schizophrenia and healthy controls. *Psychiatry Research*, 254, 112–117. <https://doi.org/10.1016/j.psychres.2017.04.040>
- Edwards, C. J., Cella, M., Emsley, R., Tarrier, N., & Wykes, T. H. M. (2018). Exploring the relationship between the anticipation and experience of pleasure in people with schizophrenia: An experience sampling study. *Schizophrenia Research*, 202, 72–79. <https://doi.org/10.1016/j.schres.2018.06.040>
- Ehrlich, C. (2023). Evaluation of the Happiness Through Goal-Setting Training. *Psychological Reports*, 126(4), 1910–1932. <https://doi.org/10.1177/00332941211071007>

- Ehrlich, C., Cripps, K., & Ehrlich, S. (2024). Self-Concordance Theory and the Goal-Striving Reasons Framework and Their Distinct Relationships With Hedonic and Eudaimonic Well-Being. *Psychological Reports*, 00332941241268557. <https://doi.org/10.1177/00332941241268557>
- Emery, N. N., Stanton, K., Baumgardner, S., Simons, J. S., Douglass, M. A., & Prince, M. A. (2023). Discrete emotions and global affect: Applying empirically driven approaches to experience sampling data to model state and trait affective structure and affect-alcohol use associations in a heavy drinking young-adult sample. *Behaviour Research and Therapy*, 167, 104356. <https://doi.org/10.1016/j.brat.2023.104356>
- Gard, D. E., Gard, M. G., Kring, A. M., & John, O. P. (2006). Anticipatory and consummatory components of the experience of pleasure: A scale development study. *Journal of Research in Personality*, 40(6), 1086–1102. <https://doi.org/10.1016/j.jrp.2005.11.001>
- Green, J. D., & Campbell, W. K. (2000). Attachment and Exploration in Adults: Chronic and Contextual Accessibility. *Personality and Social Psychology Bulletin*, 26(4), 452–461. <https://doi.org/10.1177/0146167200266004>
- Hallford, D. J., & Sharma, M. K. (2019). Anticipatory pleasure for future experiences in schizophrenia spectrum disorders and major depression: A systematic review and meta-analysis. *British Journal of Clinical Psychology*, 58(4), 357–383. <https://doi.org/10.1111/bjc.12218>
- Hu, H., Wang, L., Zhang, Y., Yang, H., Wang, Y., Wang, Y., Lui, S. S. Y., & Chan, R. C. K. (2025). Motivation and Pleasure Domain Links to Social Function in College Students: A Network Analysis. *PsyCh Journal*. <https://doi.org/10.1002/pchj.70001>
- Karthik, S. K., Pereira, K. M. K., Culbreth, A. J., Barch, D. M., & Moran, E. K. (2025). Higher motivation and pleasure scores predict more reliance on model-free decision making. *Cognitive, Affective, & Behavioral Neuroscience*. <https://doi.org/10.3758/s13415-025-01302-3>
- Kuppens, P., Champagne, D., & Tuerlinckx, F. (2012). The Dynamic Interplay between Appraisal and Core Affect in Daily Life. *Frontiers in Psychology*, 3. <https://doi.org/10.3389/fpsyg.2012.00380>
- Kuvaas, B., Buch, R., Weibel, A., Dysvik, A., & Nerstad, C. G. L. (2017). Do Intrinsic and Extrinsic Motivation relate differently to Employee Outcomes? | Request PDF. *Journal of Economic Psychology*, 61, 244–258. <https://doi.org/10.1016/j.joep.2017.05.004>
- Lenth, R. V. (2017). emmeans: Estimated Marginal Means, aka Least-Squares Means (R package version 1.8.8). [Dataset]. <https://doi.org/10.32614/CRAN.package.emmeans>
- Liu, Y., Yang, Y., Bai, X., Chen, Y., & Mo, L. (2022). Do Immediate External Rewards Really Enhance Intrinsic Motivation? *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.853879>
- Mengelkoch, S., Moriarity, D. P., Novak, A. M., Snyder, M. P., Slavich, G. M., & Lev-Ari, S. (2023). Using Ecological Momentary Assessments to Understand How Daily Fluctuations in Psychological States Impact Stress, Well-Being, and Health. *Public Health and Healthcare*. <https://doi.org/10.20944/preprints202310.0060.v1>
- Merchant, J. T., Moran, E. K., Strube, M. J., & Barch, D. M. (2023). Correlates of real-world goal-directed behavior in schizophrenia. *Psychological Medicine*, 53(6), 2409–2417. <https://doi.org/10.1017/S0033291721004281>

- Moccia, L., Mazza, M., Nicola, M. D., & Janiri, L. (2018). The Experience of Pleasure: A Perspective Between Neuroscience and Psychoanalysis. *Frontiers in Human Neuroscience*, 12, 359. <https://doi.org/10.3389/fnhum.2018.00359>
- Modirshanechi, A., Kondrakiewicz, K., Gerstner, W., & Haesler, S. (2023). Curiosity-driven exploration: Foundations in neuroscience and computational modeling. *Trends in Neurosciences*, 46(12), 1054–1066. <https://doi.org/10.1016/j.tins.2023.10.002>
- Petzke, T. M., & Schomaker, J. (2022). A bias toward the unknown: Individual and environmental factors influencing exploratory behavior. *Annals of the New York Academy of Sciences*, 1512(1), 61–75. <https://doi.org/10.1111/nyas.14757>
- Pillny, M., Schlier, B., & Lincoln, T. M. (2020). “I just don’t look forward to anything”. How anticipatory pleasure and negative beliefs contribute to goal-directed activity in patients with negative symptoms of psychosis. *Schizophrenia Research*, 222, 429–436. <https://doi.org/10.1016/j.schres.2020.03.059>
- Pradenas, D., Oyanedel, J. C., Da Costa, S., Rubio, A., & Páez, D. (2021). Subjective Well-Being and Its Intrinsic and Extrinsic Motivational Correlates in High Performance Executives: A Study in Chilean Managers Empirically Revisiting the Bifactor Model. *International Journal of Environmental Research and Public Health*, 18(15), 8082. <https://doi.org/10.3390/ijerph18158082>
- Roczniewska, M., Smoktunowicz, E., & Gruszczyńska, E. (2020). Capturing life and its fluctuations: Experience sampling and daily diary studies in studying within-person variability. *Social Psychological Bulletin*, 15(2), e3643. <https://doi.org/10.32872/spb.3643>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Schultz, W. (2023). Reward, Pleasure and Motivation. In M.-E. Lynall, P. B. Jones, & S. M. Stahl (Eds.), *Cambridge Textbook of Neuroscience for Psychiatrists* (1st ed., pp. 199–207). Cambridge University Press. <https://doi.org/10.1017/9781911623137.032>
- Schwartenbeck, P., Passecker, J., Hauser, T. U., FitzGerald, T. H., Kronbichler, M., & Friston, K. J. (2019). Computational mechanisms of curiosity and goal-directed exploration. *eLife*, 8, e41703. <https://doi.org/10.7554/eLife.41703>
- Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological Momentary Assessment. *Annual Review of Clinical Psychology*, 4(1), 1–32. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091415>
- Snaith, R. P., Hamilton, M., Morley, S., Humayan, A., Hargreaves, D., & Trigwell, P. (1995). A Scale for the Assessment of Hedonic Tone the Snaith–Hamilton Pleasure Scale. *British Journal of Psychiatry*, 167(1), 99–103. <https://doi.org/10.1192/bjp.167.1.99>
- Vecina, M. L., & Fernando, C. (2013). Volunteering and well-being: Is pleasure-based rather than pressure-based prosocial motivation that which is related to positive effects? *Journal of Applied Social Psychology*, 43(4), 870–878. <https://doi.org/10.1111/jasp.12012>

- Wang, X., Guo, X., Cai, X., Huang, B., Wang, Y., Pu, C., Yu, X., Lui, S. S. Y., & Chan, R. C. K. (2025). Cerebellar–Basal Ganglia Dysconnectivity in Schizophrenia: Insights into Motivational Deficits. *Schizophrenia Bulletin*. <https://doi.org/10.1093/schbul/sbaf087>
- Wu, H., Mata, J., Furman, D. J., Whitmer, A. J., Gotlib, I. H., & Thompson, R. J. (2017). Anticipatory and consummatory pleasure and displeasure in major depressive disorder: An experience sampling study. *Journal of Abnormal Psychology*, 126(2), 149–159. <https://doi.org/10.1037/abn0000244>
- Wu, T., & Yuan, J. (2026). Extending psychoradiology of emotion regulation from mental health to adaptiveness promotion. *Psychoradiology*, 6, kkaf037. <https://doi.org/10.1093/psyrad/kkaf037>
- Zahn, R., Moll, J., Paiva, M., Garrido, G., Krueger, F., Huey, E. D., & Grafman, J. (2009). The neural basis of human social values: Evidence from functional MRI. *Cerebral Cortex*, 19(2), 276–283. <https://doi.org/10.1093/cercor/bhn080>
- Zhang, Z., Van Lieshout, L. L. F., Colizoli, O., Li, H., Yang, T., Liu, C., Qin, S., & Bekkering, H. (2025). A cross-cultural comparison of intrinsic and extrinsic motivational drives for learning. *Cognitive, Affective, & Behavioral Neuroscience*, 25(1), 25–44. <https://doi.org/10.3758/s13415-024-01228-2>
- Zhou, Q., Zheng, Y., Guo, X., Wang, Y., Pu, C., Shi, C., & Yu, X. (2024). Abnormal hedonic process in patients with stable schizophrenia: Relationships to negative symptoms and social functioning. *Schizophrenia Research: Cognition*, 38, 100325. <https://doi.org/10.1016/j.scog.2024.100325>

Table 1 Means, Standard Deviations, ICCs, and Intercorrelations of Central Study Variables

Context	Variable	Mean (SD)	ICC1	ICC2	ICC3	2	3	4
Familiar	1. Extrinsic motivation	65.42(22.56)	0.49	0.10	0.40	0.28***	0.36***	0.31***
	2. Intrinsic Motivation	66.89(22.23)	0.47	0.12	0.41	1	0.80***	0.46***
	3. CP	68.16(21.12)	0.48	0.12	0.39		1	0.48***
	4. AP	77.17(18.20)	0.46	0.07	0.47			1
Novel	1. Extrinsic motivation	61.34(26.18)	0.56	0.06	0.38	0.29***	0.41***	0.28***
	2. Intrinsic Motivation	63.22(22.83)	0.59	0.05	0.35	1	0.78***	0.43***
	3. CP	65.57(21.34)	0.56	0.06	0.38		1	0.45***
	4. AP	77.17(18.20)	0.46	0.07	0.47			1

Note. n = 165 individuals; N = 8140. ICCs = Intraclass Correlations. ICC₁ = T-level ICC (within-subject, across EMA prompts); ICC₂ = day-level; ICC (between-day); ICC₃ = person-level ICC (between-subject). CP = Consummatory Pleasure; AP = Anticipatory Pleasure.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 2 Multilevel Model Results for Intrinsic and Extrinsic Motivation Predicting Pleasure

Experience							
Context	Motivation Type	Model	Pleasure Type	Intercept	Estimate	SE	Deviance (REML)
Novel	Extrinsic motivation	1	CP	51.92***	0.19***	0.02	69024.90
		2	AP	59.57***	0.09***	0.01	65310.70
	Intrinsic Motivation	3	CP	26.21***	0.67***	0.01	64044.60
		4	AP	55.33***	0.15***	0.01	65140.10
Familiar	Extrinsic motivation	5	CP	63.15***	0.22***	0.01	68117.10
		6	AP	61.37***	0.08***	0.01	65357.70
	Intrinsic Motivation	7	CP	28.57***	0.63***	0.01	63986.30
		8	AP	61.37***	0.13***	0.01	65210.70

Note. n = 165 individuals; N = 8140. CP = Consummatory Pleasure; AP = Anticipatory Pleasure.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 3 Moderation Effects of Context on the Relationship Between Intrinsic/Extrinsic Motivation
and Pleasure Experiences

	Consummatory Pleasure		Anticipatory Pleasure	
	Estimate	SE	Estimate	SE
Fixed effects				
Intercept	66.01***	1.02	77.26***	0.96
Extrinsic motivation	0.21***	0.01	0.05***	0.01
Context	1.81***	0.24	-0.24	0.18
Extrinsic motivation: Context	-0.04**	0.01	0.01	0.01
Deviance (REML Criterion)	136670.10		128669.60	
Fixed effects				
Intercept	67.07***	0.42	77.38***	0.91
Intrinsic Motivation	0.58***	0.01	0.09***	0.01
Context	-0.60**	0.19	-0.52**	0.18
Intrinsic Motivation: Context	0.05***	0.01	0.02*	0.01
Deviance (REML Criterion)	128804.00		128505.50	

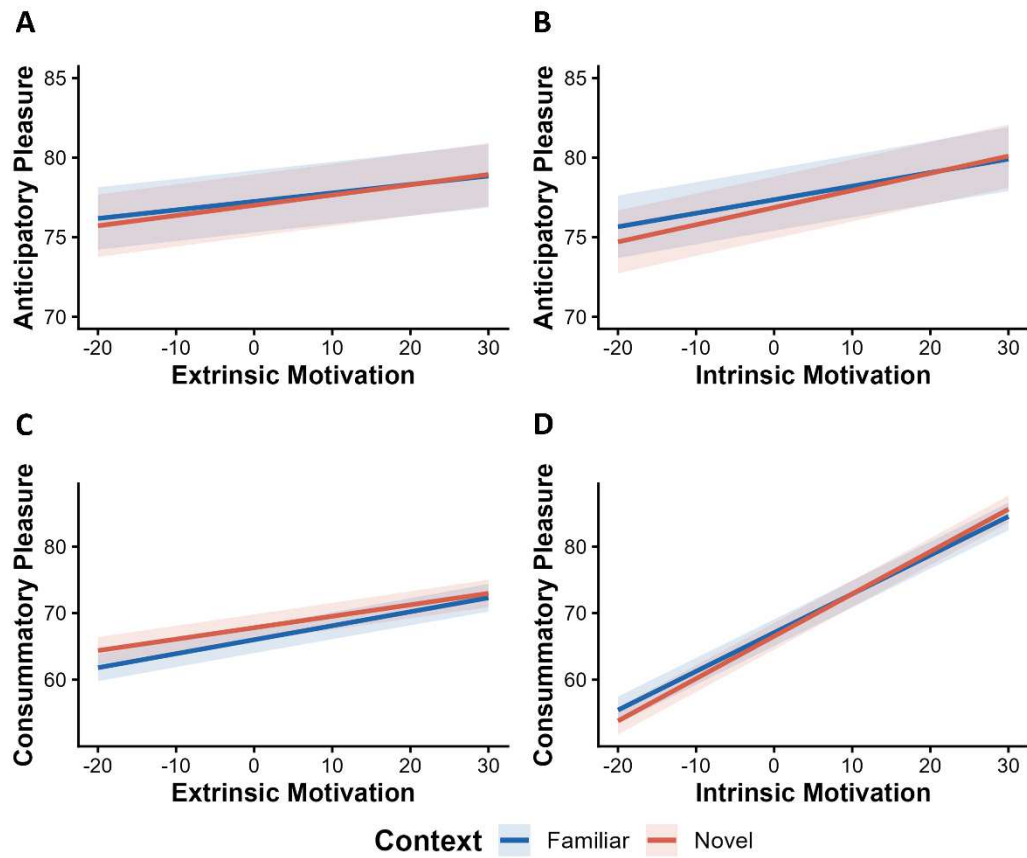
Note. n = 165 individuals; N = 8140.

* $p < 0.05$.

** $p < 0.01$.

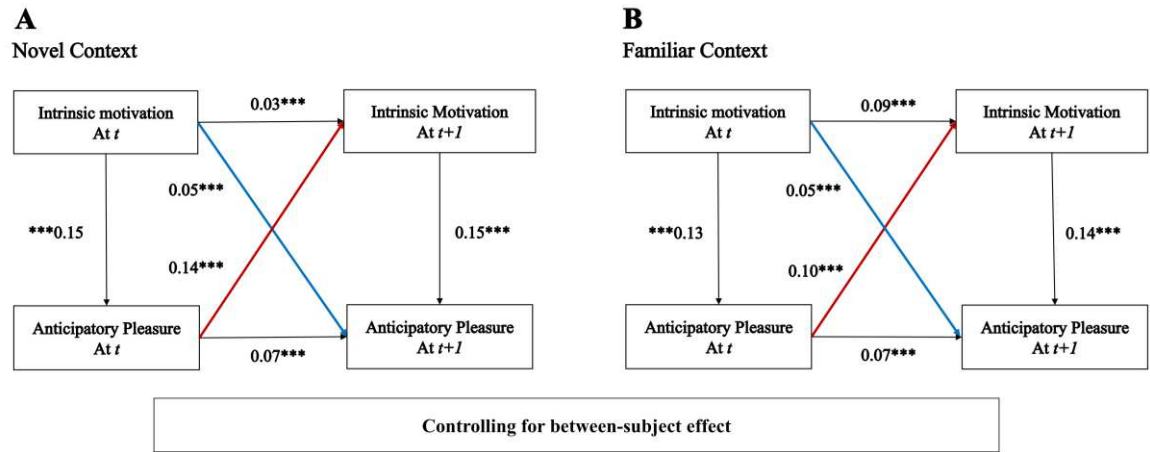
*** $p < 0.001$.

Figure 1 Model-predicted interactions illustrating the moderating effect of context.



Note. Lines represent fixed effects predictions, with shaded areas indicating 95% confidence intervals. (A–B) Anticipatory pleasure was more strongly associated with extrinsic motivation (A) and intrinsic motivation (B) in novel contexts. (C–D) Consummatory pleasure also showed amplified associations with extrinsic motivation (C) and intrinsic motivation (D) in novel settings.

Figure 2 Cross-contextual temporal coupling between intrinsic motivation and anticipatory pleasure.



Note. Results of time-lagged multilevel models examining the bidirectional associations between intrinsic motivation and anticipatory pleasure in novel (A) and familiar (B) contexts. Blue lines represent the predictive effect of intrinsic motivation at time t on anticipatory pleasure at time $t+1$. Red lines represent the reverse direction: anticipatory pleasure at time t predicting intrinsic motivation at time $t+1$. Autoregressive paths are represented by horizontal arrows. All depicted paths are statistically significant ($p < 0.05$). Models controlled for between-subject effects.

*** $p < .001$.

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