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Excessive Buying as a Means of Regulating Boredom: Moderating Role of Materialism

Nadmierne kupowanie jako zachowanie regulujące nudę: moderująca rola materializmu

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Abstract

This dissertation examines whether excessive buying behaviors can serve as a compensatory mechanism for regulating boredom. Specifically, across five studies, we investigated whether excessive buying can be used as a strategic, though potentially dysfunctional, response to mitigate boredom and re-establish a sense of personal meaning. Study 1, through a systematic literature review, mapped the experimental paradigms currently used to induce boredom. Study 2 ($N = 297$) demonstrated that induced boredom causally increases the tendency to engage in excessive buying, and that this effect is moderated by materialism: the relationship between boredom and buying was stronger among individuals with materialistic values and did not appear among those without such values. In a two-week daily diary study (Study 3, $N = 927$), we found that higher levels of daily excessive shopping predicted lower levels of evening state boredom, and this effect was more pronounced among materialistic individuals. A pilot Study 4a ($N = 231$) validated a novel boredom-induction protocol, the Clock Task, which we later used in Study 4b ($N = 766$). In Study 4b, we found that the buying-related task reduced boredom, especially among individuals high in trait materialism. However, the absence of such an effect for the desire to engage in meaningful activity suggests that, for materialistic individuals, shopping may serve as a psychological "buffer" that temporarily alleviates boredom but does not restore the sense of meaning diminished by boredom. These findings suggest that individuals who most strongly use buying to regulate boredom may be those for whom this strategy is least effective in the long term.

Keywords: *boredom, excessive buying, materialism, desire to engage in meaningful activity*

Streszczenie

Niniejsza rozprawa bada, czy nadmierne zachowania zakupowe mogą pełnić funkcję mechanizmu kompensującego nudę. W serii pięciu badań zweryfikowałyśmy, czy nadmierne zakupy mogą być stosowane jako strategiczna, choć potencjalnie dysfunkcyjna, reakcja mająca na celu złagodzenie nudy i przywrócenie poczucia sensu. Badanie 1, poprzez systematyczny przegląd literatury, dostarczyło mapy paradygmatów eksperymentalnych obecnie wykorzystywanych do indukowania nudy. Badanie 2 ($N = 297$) wykazało, że indukowana nuda zwiększa tendencję do angażowania się w nadmierne zakupy oraz że efekt ten jest moderowany przez materializm: związek między nudą a zakupami był silniejszy wśród osób wyznających wartości materialistyczne i nie występował u tych, które ich nie podzielają. W dzienniczkowym Badaniu 3 ($N = 927$) odkryłyśmy, że wyższy poziom codziennych nadmiernych zakupów wiązał się z niższym poziomem wieczornej nudy, a efekt ten był silniejszy u osób wysoko materialistycznych. Pilotażowe Badanie 4a ($N = 231$) zvalidowało nowatorski protokół indukowania nudy „Clock Task”, który następnie zastosowałyśmy w Badaniu 4b ($N = 766$), w którym zaobserwowałyśmy, że zadanie związane z zakupami hamowało nudę, szczególnie wśród osób o wysokim poziomie materializmu. Brak takiego efektu w przypadku pragnienia zaangażowania się w sensowną aktywność sugeruje, że dla osób materialistycznych zakupy mogą pełnić rolę psychologicznego „bufora”, który tymczasowo łagodzi awersyjny stan nudy, ale nie przywraca poczucia sensu ograniczonego przez nudę. Wyniki sugerują, że osoby, które najczęściej wykorzystują zakupy do regulacji nudy, to te same, dla których strategia ta jest najmniej skuteczna w dłuższej perspektywie.

Słowa kluczowe: *nuda, nadmierne kupowanie, materializm, pragnienie zaangażowania w sensowną aktywność*

Introduction

Boredom is often portrayed as a defining experience of contemporary life. Headlines such as *The Plague of Boredom* (Horne, 2020) or *Boredom: The Disease of Our Time* (Colier, 2012) reflect a widespread cultural concern that boredom has become pervasive in modern societies. Empirical evidence supports this perception: around 20% of US adolescents report experiencing high levels of boredom (Martz et al., 2018), between a third and over 80% of employees report to feel bored at work at least occasionally (Loukidou et al., 2009; Van Der Heijden et al., 2012; Watt & Hargis, 2009), and up to 90% of American adults claim to experience boredom at some point in their daily lives (Chin et al., 2017; Harris, 2000). These findings suggest that boredom is not an occasional anomaly but a frequent psychological state that people must commonly regulate.

Because boredom is unpleasant, people are motivated to do something about it. Research suggests that boredom signals that current activities lack sufficient engagement, stimulation, or meaning, thereby motivating individuals to seek alternative activities to restore these deficits (Bench & Lench, 2019; Eastwood et al., 2012; Van Tilburg & Igou, 2017a). Indeed, boredom has been associated with a wide range of behaviors aimed at escaping the unpleasant state, including seeking novel experiences, engaging in impulsive actions, overeating, and risk-taking (Havermans et al., 2015; Kılıç et al., 2020; Moynihan et al., 2015). In other words, boredom often functions as a motivational signal that prompts individuals to search for activities that are more stimulating or meaningful.

Interestingly, everyday intuition and popular media often suggest that shopping may serve as one such strategy. Advice columns and lifestyle articles frequently warn readers about “shopping out of boredom” and provide tips on how to avoid buying unnecessary items simply because one has nothing better to do (Ceron, 2021; Lovitch, 2024). This widespread

belief implies that buying may serve as a convenient way to escape boredom by providing stimulation, novelty, or a temporary sense of satisfaction.

Despite the prevalence of this belief, empirical research directly examining the relationship between boredom and buying behavior remains surprisingly limited. Existing research shows that boredom is related to impulsivity and risky decision-making (Kılıç et al., 2020) and that boredom susceptibility is positively associated with impulsive buying tendencies (Gasiorowska, 2011). However, relatively little research has investigated whether boredom actually promotes everyday buying behavior or whether engaging in buying-related activities can alleviate boredom itself. Consequently, it remains unclear whether the commonly held intuition that people shop when they are bored reflects a genuine psychological mechanism or merely a cultural stereotype.

The present research addresses this gap by examining the relationship between boredom and buying behavior. Specifically, we investigate whether boredom increases excessive buying and engagement in buying-related activities, and whether such engagement subsequently reduces boredom. In addition, we examine an important individual difference that may shape this relationship—materialism (Belk, 1985; Richins, 2017; Richins & Dawson, 1992). Individuals high in materialistic values tend to view acquiring goods as an important source of happiness, success, and meaning in life (Richins, 2004). Therefore, they may be particularly likely to use buying as a coping strategy for boredom.

Boredom

Boredom is a complex psychological phenomenon that can be studied from multiple complementary perspectives. These perspectives can be broadly grouped into trait, state, and integrative approaches that are presented further in this chapter.

Definitions of Boredom

The first approach focuses on boredom proneness as a trait. Although trait boredom is a commonly researched topic, most studies define it broadly, for instance, as a propensity to experience boredom or a tendency to become easily bored (Farmer & Sundberg, 1986; Harris, 2000; LePera, 2011; MacDonald & Holland, 2002; Matic et al., 2015; S. J. Vodanovich et al., 1991; von Gemmingen et al., 2003). Zuckerman (2014) provided a more in-depth definition by describing boredom proneness as an aversion to repetitive experiences of any kind, monotonous work, boring and uninteresting people, and heightened discomfort in situations where it is not possible to escape such conditions. The most nuanced definition comes from Sundberg et al. (1991). They described trait boredom as “a tendency to experience tedium and lack of personal involvement and enthusiasm, to have a general or frequent lack of sufficient interest in one’s life surroundings and future” (p. 210).

In contrast, state boredom refers to a temporary experience that emerges in response to situational conditions (Greenson, 1953; Neu, 1998), such as monotonous tasks, lack of stimulation, or perceived meaninglessness of an activity (Tam, Van Tilburg, Chan, et al., 2021; Van Tilburg & Igou, 2011). It has been conceptualized as a conflict between the tendency to continue the behavior and the tendency to leave a situation that has become unpleasant due to insufficient motivation of the individual, resulting in poor psychological adjustment (Barmack, 1939; Danckert & Elpidorou, 2023; Tam, Van Tilburg, Chan, et al., 2021). Fenichel (1951) succinctly captured this tension, stating that “boredom arises when we must not do what we want to do or must do what we do not want to do” (p. 359). The most commonly applied definition of boredom is the one used by Eastwood et al. (2012): Boredom is “an aversive state of wanting, but being unable, to engage in satisfying activity” (p. 482). This experience is typically accompanied by negative affect, difficulties maintaining attention, and a perception that time passes slowly. Boredom also reflects a mismatch

between the level of cognitive engagement that individuals desire and the level of engagement provided by the current activity (Eastwood et al., 2012; Tam, Van Tilburg, Chan, et al., 2021).

An integrative approach combines these perspectives by conceptualizing boredom as a state-trait system. In this view, state boredom represents a temporary experience of nonoptimal arousal and negative affect arising from situational (Mikulas & Vodanovich, 1993) or individual factors (Farmer & Sundberg, 1986), whereas trait boredom reflects the chronic frequency tendency to experience such states frequently and intensely, alongside a generalized perception that life is boring (Tam, Van Tilburg, Chan, et al., 2021). Thus, trait boredom can be understood as reflecting the frequency and intensity of state boredom across time and contexts.

Determinants and correlates of boredom

The determinants of boredom can be divided into situational and individual factors. A primary situational antecedent is monotony (Daschmann et al., 2011; Loukidou et al., 2009; O’Hanlon, 1981). In his list of five general points on where boredom occurs, O’Hanlon (1981) stated: “Boredom occurs as a reaction to task situations where the pattern of sensory stimulation is nearly constant or highly repetitious, and particularly when required motoric responding is contingent upon information contained within the monotonous stimulation” (p. 54). A second situational cause relates to the level of stimulation provided by a situation (Daschmann et al., 2011; Mikulas & Vodanovich, 1993), which explains, for example, why students become bored in class where the material is not well adjusted to their knowledge and their need for achievement. A third situational determinant is the compulsion to stay in a boring situation (Barmack, 1939; Fenichel, 1951), resulting in a conflict between wanting and being unable to change the activity from boring into a non-boring one.

Among the individual predictors of state boredom, boredom proneness plays a central role by predisposing individuals to experience boredom more frequently (Farmer & Sundberg, 1986; Harris, 2000; LePera, 2011). Additionally, sensation seeking represents a broader dispositional trait related to optimal levels of arousal (Leong & Schneller, 1993). According to Zuckerman (1971), people with a higher optimum level of arousal are more prone to boredom; they are more likely to experience boredom in low-stimulation environments than individuals low in sensation seeking.

Boredom is also associated with several experiential correlates. One of the most robust is the perception of slowed time (Raffaelli et al., 2017). Psychological time, defined as the subjective estimation of time passing, tends to be overestimated during boredom. Additionally, the likelihood of overestimating the time spent on a boring task is higher among highly boredom-prone people (Danckert & Allman, 2005). Distorted time perception is considered a functional signal indicating the need to change an unsatisfactory situation (Bench & Lench, 2013; Raffaelli et al., 2017).

Another key correlate concerns arousal. Researchers have also indicated that non-optimal arousal—whether too-low (Hebb, 1955; Iso-Ahola & Weissinger, 1990; Mikulas & Vodanovich, 1993), too-high (Berlyne, 1960; London et al., 1972), or mixed (Danckert et al., 2018)—is a key experiential component of boredom, suggesting that boredom reflects non-optimal levels of stimulation. Finally, physiological states such as fatigue also contribute to boredom. Additionally, research indicates that boredom is more likely to appear in the afternoon or in the evening, when people experience higher levels of sleepiness (Mavjee & Home, 1994; Raffaelli et al., 2017).

A persistent challenge in conceptualizing boredom stems from a lack of theoretical consensus regarding the structural role of its associated phenomena—specifically, whether they function as correlates, antecedents, proximal outcomes, or constitutive elements of the

state itself. This taxonomic ambiguity is particularly evident in the relationship between boredom and the perception of meaning. While Van Tilburg and Igou (2011, 2017a) identify a diminished sense of meaning as a salient component of the boredom experience, Chan et al. (2018) argue that a hampered sense of meaning serves as the foundational characteristic—the very essence—of the construct. Furthermore, the researchers (Chan et al., 2018) claim that boredom posits a complex functional role for meaning, suggesting it may operate as both a phenomenological constituent and a longitudinal predictor of boredom, complicating the distinction between the state's internal structure and its causal mechanisms.

Importantly, the present research does not aim to resolve the ongoing debate regarding the structural status of meaning in relation to boredom—whether it constitutes an antecedent, a consequence, or a core component of the experience. Instead, we adopt a pragmatic, empirical approach that brackets these taxonomic distinctions. Specifically, we examine whether experimentally induced boredom influences the *desire for meaning*, operationalized as an increased motivation to seek meaning or engage in meaningful activities (Stillman & Baumeister, 2009; Van Tilburg et al., 2019). In this sense, we treat this motivational tendency as a proxy for deficits in perceived meaning, assuming that heightened desire for meaning may reflect a compensatory response to its temporary lack. Furthermore, we investigate whether coping processes can attenuate or compensate for these effects—particularly, whether engaging in adaptive responses to boredom can reduce this heightened desire by restoring a sense of meaning.

Theoretical approaches to boredom

The literature offers numerous theories of boredom, explaining its functions and underlying mechanisms, such as its self-regulatory function (Bench & Lench, 2013), its role in shaping the sense of meaning in life (Van Tilburg & Igou, 2011, 2012, 2017a), boredom as an attentional phenomenon (Eastwood et al., 2012; Tam, Van Tilburg, Chan, et al., 2021;

Westgate & Wilson, 2018), and its perception as an agential crisis (Gorelik & Eastwood, 2024). Although these approaches emphasize different mechanisms, they are largely complementary and together provide a comprehensive account of boredom.

Functional and self-regulatory accounts. Several theoretical perspectives emphasize the functional role of boredom. In this view, boredom acts as a self-regulatory signal indicating that the current situation fails to satisfy important psychological needs, such as stimulation, engagement, or meaning (Bench & Lench, 2013; Van Tilburg & Igou, 2017a). According to this theory, boredom can catalyze reorientation of our aspirations and the pursuit of different, more suitable goals (Raffaelli et al., 2017). When people experience boredom, they become motivated to change their situation or behavior to address these deficits. Consistent with this view, boredom has been linked to a wide range of behaviors aimed at escaping the unpleasant state. These behaviors include seeking novel or stimulating experiences (Bench & Lench, 2019), engaging in impulsive actions (Moynihan et al., 2017), overeating (Havermans et al., 2015; Moynihan et al., 2015), and risk-taking in financial decisions (Kılıç et al., 2020). Importantly, such behaviors do not necessarily solve the underlying problem that caused boredom; rather, they may provide temporary stimulation or distraction.

Meaning-based accounts. Another line of research highlights the role of boredom in threatening the sense of meaning. Studies by Van Tilburg and Igou (Van Tilburg & Igou, 2011, 2012, 2017a) demonstrate that boredom reduces perceived meaning in life and motivates individuals to engage in compensatory behaviors aimed at restoring a sense of purpose. Similarly, Eastwood et al. (2012) postulated that an impoverished sense of meaning in life may be both a psychological cause and a consequence of constant boredom.

The experience of boredom leaves people with an uncomfortable sense that their activities are meaningless (Van Tilburg & Igou, 2011), prompting them to regain a sense of meaningfulness. Given that the need for meaning is an fundamental human motivation (Heine

et al., 2006), such perceived deficits may constitute a psychological threat (O’Dea et al., 2022). Compensatory responses may include increased identification with social groups, support for ideological causes, or engagement in prosocial behavior (Van Tilburg & Igou, 2016, 2017b). Taken together, these findings suggest that boredom motivates individuals to search for activities that either increase stimulation or restore meaning. This motivational function of boredom provides a useful framework for understanding why individuals may engage in consumption behaviors when they are bored.

Attentional accounts. A third theoretical approach focuses on the attentional features of boredom. Within this approach, Eastwood et al. (2012, p. 482) defined boredom as “an aversive state that occurs when we are not able to successfully engage attention with internal or external information required for participating in satisfying activity.” In this view, boredom arises from a mismatch between required and available attentional engagement.

Building on this, Tam and colleagues (2021) state that inadequate attentional engagement is a key condition for the emergence of boredom. Following Eastwood et al. (2012), they propose a Boredom Feedback Model (BFM), in which boredom reflects a discrepancy between actual and desired levels of attentional engagement (Tam, Van Tilburg, Chan, et al., 2021). Similarly, Westgate and Wilson (2018), in their Meaning and Attentional Components (MAC) model, argue that boredom may arise independently of deficits in attention or meaning. They further note that attentional deficits leading to boredom can result from both under- or overstimulation. These accounts predict that boredom will be associated with reduced task performance, particularly in contexts that require sustained attention.

Agency-based accounts. Another approach frames boredom as an agential crisis. From this perspective, “to be bored is to struggle to engage in an agentic action” (Elpidorou, 2021, p. 114). In this view, boredom reflects difficulties in initiating and sustaining goal-directed behavior, particularly among individuals high in boredom proneness. Such individuals may

experience a chronic lack of agency, impairing their ability to form and pursue goals.

Situations that restrict autonomy or impose unwanted tasks may therefore intensify boredom and motivate attempts to reassert agency, for example, by disengaging or withdrawing.

Integrative perspective Although the boredom theories differ in the psychological constructs they emphasize (Elpidorou, 2023), they converge on a common core: boredom reflects a state in which individuals want to engage in satisfying activity but are unable to do so. As summarized by Eastwood et al. (2012, p. 484) “boredom is the experience of being disengaged and stuck in an endless, dissatisfying present”.

Strategies for dealing with boredom

Individuals employ a variety of strategies to regulate and alleviate boredom. These strategies can be grouped into three broad categories: (1) changing the situation or activity, (2) regulating attention and engagement, and (3) restoring arousal or meaning.

Changing or enriching the activity. The first group of strategies involves directly modifying the situation. Individuals may attempt to replace a boring activity with a more stimulating one (Bench & Lench, 2013; Van Tilburg & Igou, 2019), such as reading a book, watching TV, or exercising (Harris, 2000). Alternatively, and especially if undertaking a different non-boring activity is not an option, sometimes people attempt to make their current activity more engaging (Sansone et al., 1992). Such strategies include enhancing the challenge posed by the activity (Bandura, 1982), redirecting attention to overlooked aspects of the environment, or introducing variation into task performance (Sansone et al., 1992). A particularly effective strategy involves redefining the activity by assigning it a more meaningful purpose, thereby transforming its subjective experience (Sansone et al., 1992). In this way, even the most monotonous and boring job can become an unusual adventure.

Attentional disengagement. Another set of strategies involves regulating attention (Eastwood et al., 2012). Individuals may disengage from the current activity by shifting

attention away from it, for example, through mind wandering, a mental state that appears when our attention is focused more on our thoughts than on the outside world and sensory environment (Martarelli et al., 2021). This form of cognitive escape from boredom often occurs spontaneously and allows individuals to temporarily alleviate the aversive state of feeling bored.

Arousal-restoration and impulsive strategies. A third group of strategies focuses on restoring optimal levels of arousal. In this context, research demonstrates that in order to feel properly aroused again, people may engage in behaving impulsively (Moynihan et al., 2017). Those impulsive behaviors may range from impulsive eating (Moynihan et al., 2015), through impulsive bidding at auctions (Cheema et al., 2012, Kocimska-Bortnowska et al., 2026b), up to impulsive buying (Rook & Fisher, 1995). Individuals may also seek novel or intense experiences (Bench & Lench, 2013). The source of pursued novel experience can either be internal (self-generated) or external to the person. Such behaviors may serve to counteract under-stimulation but are often maladaptive, as they might include substance use (LePera, 2011), problematic gambling (Mercer & Eastwood, 2010), overeating and binge eating (Havermans et al., 2015; Moynihan et al., 2015; Stickney et al., 1999), and risk-taking in various domains, including financial risk (Kılıç et al., 2020).

Meaning-restoration strategies. Finally, some strategies focus on restoring a diminished sense of meaning. Rather than merely alleviating negative affect, these responses aim to reestablish purpose. That means that, people are bored, instead of simply engaging in activities that are not boring, they might engage in more complex compensatory behaviors (Coughlan et al., 2019; Van Tilburg & Igou, 2016, 2017a) that serve not only to cope with the negative affect by making the situation more interesting but also, and perhaps most importantly, to restore a diminished sense of purpose (Barbalet, 1999; Fahlman et al., 2009).

This reasoning is consistent with theories of meaning regulation, which posit that the need for meaning is a fundamental human motivation. When this need is threatened, individuals are motivated to restore it by engaging in activities and commitments perceived as meaningful (Coughlan et al., 2019; Van Tilburg & Igou, 2016, 2017b). In line with this argumentation, Van Tilburg & Igou (2017b) showed that boredom can have consequences that are socially positively valued. Their findings indicate that boredom can increase prosocial intentions and, in turn, prosocial behavior, especially when such actions are perceived as highly meaningful. Importantly, these actions are not necessarily stimulating, interesting, or arousing, yet they still function as an effective way of coping with the longer-lasting consequences of boredom. The same team of researchers (Van Tilburg & Igou, 2016), in a related line of work, showed that another way to reestablish a diminished sense of meaning is through engagement with more extreme political orientations (both left- and right-wing).

Another way of reintroducing meaningfulness into people's lives was described by Van Tilburg and colleagues (2013). These researchers showed that people tend to appeal to nostalgia, which, by allowing them to return to their past, provides an opportunity to find and regain the meaning diminished by experiencing boredom. Finally, Coughlan et al. (2019) argued that the same mechanism of trying to reestablish a sense of meaning undermined by boredom can be responsible for an elevated affirmation of heroes. Heroes inspire people to do the right thing and improve their performance in life, which requires inhibition and self-control. By doing so, heroes become representations of individuals' goals and desires, and as a result, they strongly contribute to people's sense of purpose in life. These findings further contribute to our understanding of the existential and psychological qualities of boredom.

However, apart from many socially "positively" perceived ways to restore meaning in life, we can also distinguish some non-adaptive strategies. In the chase for meaningfulness,

some people seek momentary refuge in hedonic or stimulating distractions (Moynihan et al., 2021). These researchers argued that sometimes the actions undertaken as a result of a diminished sense of meaning are not aimed at restoring it. Instead, they are meant to counteract awareness of one's bored and meaningless self. In their work, Moynihan et al. (2021) also argued that the impulsive behaviors used as a way to restore a desired arousal level in the context of boredom—such as impulsive consumption (Groeppel-Klein, 2005; Moynihan et al., 2015), risk-taking across various domains (e.g., health, safety, recreation, gambling), increased interest in hedonic forms of sex (Moynihan et al., 2021) or “dark flow,” defined as a highly absorbing and enjoyable experience which, through loss of self-reflection and underestimation of risk, leads to engagement in high-risk activities such as problem gambling (Wisman, 2006)—are also meant to distract individuals from focusing on the feeling of meaninglessness. Overall, it might be argued that many of the more complex behaviors—serving not only as a mere escape from a boring situation—are ultimately oriented toward addressing a diminished sense of meaning. Depending on the type of behavior, they either help individuals regain meaningfulness or help them avoid confronting the meaninglessness that boredom evokes. In this context, the present research focuses on whether excessive buying can alleviate boredom, both by restoring optimal levels of arousal and by reestablishing a sense of meaning.

Boredom and Excessive Buying

Consumption can be defined as a group of actions such as selecting, purchasing, or using products, services, ideas, or experiences aimed at satisfying one's needs (Lintott, 1998). At the most general level, consumption has an instrumental function: people purchase and use goods and services in order to satisfy needs related not only to survival, but also to comfort, convenience, and everyday functioning. In contemporary consumer societies, however, purchasing decisions are often driven not only by utilitarian considerations but also by

psychological motives, such as regulating emotions, expressing identity, or pursuing symbolic goals (e.g., Bartels & Urminsky, 2011; Belk, 1988; Koles et al., 2018; Rucker & Galinsky, 2008; Shrum et al., 2013). Thus, consumption is not merely a means of obtaining functionally useful products, but also a way of managing one's emotions, constructing and expressing identity, communicating social position, and pursuing personally valued meanings. From this perspective, buying products or even just browsing shopping malls or online shops can provide novelty, stimulation, and immediate hedonic reward (Chang et al., 2011), helping to counteract the low arousal associated with boredom. At the same time, consumption may also provide symbolic meaning by reinforcing identity or signaling progress toward valued goals (Belk, 1988; Folwarczny et al., 2024; Shrum et al., 2013). Consequently, consumption may function as a convenient strategy for coping with unpleasant emotional states, including boredom. In other words, people may turn to consumption not only because they need something in a practical sense, but also because they believe that consumption can satisfy emotional, social, symbolic, and existential needs that go beyond immediate utility.

The traditional economic and consumer behavior models assume a “rational,” discerning, thoughtful consumer who gathers information strategically and buys goods according to functional cost/benefit considerations (Dittmar & Drury, 2000). However, this view has been challenged, particularly in the context of widening consumer choices. In contemporary society, people consume to an extent that exceeds satisfying immediate functional needs. This phenomenon is usually called excessive consumption or overconsumption, and it refers not only to excessive food intake but also to buying and consuming an excessive amount of material goods, experiences, or even information (Solomon et al., 2014). More specifically, excessive consumption may be understood as consumption that goes beyond what is immediately necessary for practical functioning and is

increasingly driven by psychological motives rather than by utilitarian benefits or financial constraints. In this sense, there is a shift from buying in order to satisfy physical or practical needs toward using consumer goods as a means of acquiring and expressing self-identity (e.g., Dittmar, 1992; Dittmar & Drury, 2000), regulating emotions (e.g., Elliott, 1994), or gaining social status (e.g., McCracken, 1990) through the symbolic meaning associated with material goods or with buying itself (Dittmar, 2005). Indeed, buying and consuming became increasingly psychologically driven, with people purchasing goods not only for their usefulness but also for the emotional, social, identity-related, and symbolic benefits they are expected to provide (Dittmar, 2005). From this perspective, buying can also function as a strategy for coping with unpleasant emotional states, including boredom.

In the present work, it is also important to distinguish excessive buying from related concepts such as impulsive and compulsive buying. Impulsive buying usually refers to spontaneous, immediate, and unplanned purchases, often undertaken with little deliberation and in response to situational or emotional triggers (Gasiorowska, 2011, 2013; Rook & Fisher, 1995). Compulsive buying, in turn, is typically understood as a more chronic, repetitive, and difficult-to-control pattern of purchasing that may become maladaptive or even pathological (Dittmar, 2005; Faber & O'Guinn, 1992; Gasiorowska, 2001). Excessive buying, as understood here, is a broader category: it refers to purchasing or buying-related activity that exceeds immediate functional necessity and is driven primarily by psychological motives (Kyrios et al., 2020; Wu, 2006). Therefore, excessive buying may include impulsive purchases, but it is not limited to them; at the same time, it may overlap with compulsive buying in some cases, but it does not have to imply pathology or clinical severity.

Some research suggests that boredom may be associated with impulsive consumption. For example, susceptibility to boredom has been shown to correlate positively with impulsive buying tendencies (Gasiorowska, 2011). Similarly, boredom has been linked to impulsive

behaviors across several domains, including eating, risk-taking, and financial decision making (Havermans et al., 2015; Kılıç et al., 2020; Moynihan et al., 2015). Research in marketing has also indicated that boredom proneness may predict impulse purchasing tendencies and related behaviors such as increased engagement with digital devices or online environments that facilitate consumption (Bozaci, 2020). However, despite these indications, existing research on boredom and excessive buying remains limited in scope and fragmented. Much of the available evidence relies on correlational studies examining boredom proneness and impulse buying tendencies rather than directly measuring purchasing behavior. For instance, survey-based studies typically focus on trait boredom and its association with impulse consumption or related behaviors, not providing any causal evidence for the link between buying and boredom (e.g., Bozaci, 2020; Gasiorowska, 2011). Other studies examining boredom and consumption rely primarily on qualitative or exploratory approaches. For example, interview-based research on online fashion shopping suggests that consumers sometimes engage in impulse purchases when bored, describing online shopping as a way of “clicking the boredom away” (Sundström et al., 2019). However, such studies are typically conducted with small samples and specific product categories, making it difficult to draw general conclusions about the role of boredom in consumer behavior more broadly. Furthermore, some contributions addressing the relationship between boredom and consumer culture adopt a conceptual or sociological perspective, arguing that boredom plays a structural role in sustaining consumer capitalism by motivating individuals to seek novelty and consumption (e.g., Finkielstein, 2022). Whereas these analyses provide valuable theoretical insights, they do not offer systematic empirical tests of how boredom affects individual buying behavior. In particular, little research has systematically examined whether boredom leads people to engage in buying behavior in everyday contexts or whether buying-related activities can actually alleviate boredom.

In the present research, we focus specifically on excessive buying, understood as purchasing behavior that exceeds immediate functional needs and is driven primarily by psychological motives rather than necessity. Excessive buying may manifest in unplanned purchases, the acquisition of products that are not strictly needed, or engaging in buying-related activities, such as browsing online stores or spending time in the shopping malls, that may increase the likelihood of spending (Dittmar & Drury, 2000; Li et al., 2019; Rook & Fisher, 1995). Importantly, excessive buying does not necessarily imply pathological or compulsive buying behavior; rather, it refers to everyday consumer actions that involve spending beyond immediate necessity and may be motivated by emotional regulation or situational cues. This conceptualization allows us to examine whether boredom may promote everyday forms of purchasing that go beyond immediate necessity, including purchases that are impulsive in form, but not necessarily compulsive in nature. Therefore, our first hypothesis is that (H1) boredom triggers excessive buying.

Another important question concerns whether engaging in buying-related behavior can reduce boredom itself. If purchasing functions as a boredom-regulation strategy, then engaging in such behavior should alleviate the unpleasant state that triggered it. At the same time, however, it is possible that buying provides only temporary stimulation without addressing the underlying sources of boredom. Understanding the relationship between boredom and buying, therefore, requires examining not only whether boredom increases consumption but also the boundary conditions for whether excessive buying can be an effective strategy for coping with boredom.

Because boredom can be regulated through various strategies, including social interaction, leisure activities, and cognitive disengagement (Bench & Lench, 2013; Van Tilburg & Igou, 2017a), buying might be treated as one of the different possible responses to boredom. Yet buying may be a particularly attractive strategy because it can promise multiple

kinds of psychological reward at once. Beyond its instrumental value, consumption may offer stimulation and hedonic pleasure, support emotion regulation, reinforce identity, communicate status, and provide symbolic confirmation that one is moving toward desired goals or becoming a desired kind of person. For this reason, consumption may be perceived as capable of satisfying not only practical needs, but also emotional, symbolic, social, and self-related needs. Importantly from the perspective of the present research, it is also possible that people believe consumption can satisfy needs related to meaning and significance. If so, excessive buying may be attractive not only because it counteracts the under-stimulation associated with boredom, but also because it may be seen as a way of restoring a diminished sense of meaning. Therefore, our second hypothesis is that (H2) excessive buying hinders boredom and the desire for the sense of meaning.

Against this background, an important question remains: why do some people respond to boredom by engaging in buying behavior, whereas others turn to different activities? One particularly relevant factor in this context may be materialism, a value orientation that emphasizes the importance of acquiring material possessions (Richins, 2004, 2017; Richins & Dawson, 1992).

Materialism as a Moderator of the Link Between Boredom and Excessive Buying

Materialism is commonly defined as a value orientation in which the acquisition and possession of material goods are considered central to life, an important indicator of success, and a key source of happiness (Richins, 2004; Richins & Dawson, 1992). Individuals who strongly endorse materialistic values tend to attach greater importance to consumption and are more likely to view acquiring goods as meaningful and personally rewarding (Kasser, 2002). This conceptualization is consistent with other approaches that operationalize materialism as, for example, the significance one attaches to the material possessions as a part of one's personality structure (Belk, 1985), a preference for acquiring material possessions

over experiential purchases (Van Boven & Gilovich, 2003), or the extent to which people try to build their self-identity on the acquisition of various goods (Shrum et al., 2013). Finally, a more complex view on materialism was offered by Kasser and Ryan (1996), who divided human aspirations into intrinsic and extrinsic ones. In that division, materialism fits into the extrinsic group by being connected with achieving external approval and rewards. A combination of the three main materialistic goals (the materialistic triad) consists of “financial success (money), social recognition (fame), and an appealing appearance (image)” (Kasser & Ryan, 1996, p. 280).

Research suggests that materialistic values shape how individuals interpret and respond to consumption opportunities. For highly materialistic individuals, purchasing goods can serve not only utilitarian purposes but also symbolic and psychological ones, such as expressing identity, achieving social status, or pursuing life goals (Kasser, 2002, 2016; Kasser & Sheldon, 2000). In this sense, highly materialistic individuals might assume that buying provides not only immediate gratification but also a sense of direction and purpose, making consumption an activity that is experienced as meaningful. More broadly, for individuals high in materialism, consumption may be perceived as a legitimate and effective way of fulfilling needs that extend beyond practical utility, including needs related to identity, self-worth, and life meaning.

However, research suggests that focus on materialistic goals rarely leads to long-term psychological satisfaction (Dittmar et al., 2014). Instead, it often draws individuals into a repetitive cycle of consumption where the initial excitement of a purchase quickly fades, leading to a constant longing for more. This psychological process, known as the hedonic treadmill, explains why people in materialistic societies often find themselves in a perpetual struggle to reach happiness through new goals, failing to realize that these efforts are ultimately ineffective for achieving lasting well-being in the long run (Diener et al., 2006).

From the perspective of boredom research, this tension is particularly relevant. As discussed earlier, boredom has been shown to threaten individuals' sense of meaning and motivate behaviors aimed at restoring a sense of purpose (Van Tilburg & Igou, 2011). If consumption is perceived as capable of restoring stimulation in meaning, then individuals who strongly value material goods may be especially likely to use buying as a strategy for coping with boredom. In other words, when boredom signals a deficit in meaning, materialistic individuals may be more inclined to turn to consumption as a way of addressing this deficit.

At the same time, it remains unclear whether engaging in consumption-related behavior is actually effective in reducing boredom or restoring a diminished sense of meaning. Although individuals high in materialism may believe that buying can serve these functions, existing evidence suggests that materialistic pursuits are associated with lower psychological well-being and may fail to provide lasting satisfaction (Diener et al., 2006; Kasser, 2002). This raises the possibility that consumption, while subjectively perceived as a solution to boredom, may in fact be ineffective in alleviating it, particularly in the long term.

Consequently, opposing predictions emerge. On the one hand, individuals high in materialism should be more likely to respond to boredom by engaging in buying behavior, because they perceive consumption as meaningful and rewarding. On the other hand, buying may not successfully reduce boredom or restore meaning, and repeated reliance on such strategies may contribute to diminished well-being over time.

In contrast, individuals low in materialism may be less inclined to see consumption as a meaningful or rewarding activity. For them, boredom may be more likely to trigger alternative coping strategies, such as social interaction, entertainment, or other non-consumption activities. Thus, the extent to which boredom translates into buying behavior

may depend on the importance individuals perceive consumption as capable of fulfilling psychological and existential needs.

Taking together these considerations, our third hypothesis (H3) is that materialism moderates both the relationship between boredom and excessive buying and the relationship between the desire for a sense of meaning and excessive buying. Specifically, boredom should be more likely to lead to buying among individuals who strongly endorse materialistic values, because they are more likely to perceive consumption as both psychologically rewarding and meaningful, including as a potential source of restored stimulation and regained sense of purpose. However, whether such behavior actually alleviates boredom and restores a sense of meaning remains an open empirical question.

Intended Theoretical Contribution and Overview of the Studies

Understanding how people respond to aversive psychological states is a central question in both emotion research and consumer psychology. While previous research has shown that boredom motivates individuals to seek stimulation and meaning, relatively little is known about whether everyday consumption may serve as a behavioral response to boredom. The present research addresses this question by examining whether boredom promotes excessive buying and whether engaging in buying-related activities can alleviate boredom.

Building on functional accounts of boredom, we propose that consumption may serve as a readily available behavioral response to boredom. In modern consumer environments, buying-related activities—such as browsing shops or purchasing small consumer goods—are easily accessible and may provide immediate stimulation or symbolic meaning. As a result, individuals experiencing boredom may turn to consumption as a convenient strategy for regulating this aversive state.

Importantly, we argue that this tendency should depend on individual differences in materialism. Because materialistic individuals view acquiring goods as an important source

of happiness, success, and meaning (Richins, 2004, 2017), they may be particularly likely to interpret consumption as a meaningful and rewarding response to boredom. Consequently, boredom should be more likely to translate into buying behavior among individuals who strongly endorse materialistic values.

To test these ideas, we conducted four studies using complementary methodologies that combine real-life behavioral observation with controlled experimental tests. Study 1 aimed to systematically map the landscape of experimental boredom inductions, identifying major methodological families that vary in the degree of experimental control they afford, and to establish the case for active, quantity-based manipulations as the most methodologically sound approach for isolating boredom as a causal mechanism.

Preregistered laboratory experimental Study 2 tests the causal role of boredom in a controlled laboratory experiment. Participants were randomly assigned to a boredom condition or a control condition and performed the boredom-induction task that was chosen based on the results of the systematic review. They then received five play banknotes to buy their study rewards, and were given a choice between spending the money immediately on a set of stimulating but unnecessary consumer items or using the money to enter a lottery offering a substantially larger but uncertain reward. This paradigm allows us to examine whether boredom increases the tendency to engage in immediate, hedonic, and non-necessary consumption rather than pursue a delayed but potentially more valuable outcome. We further test whether this effect is moderated by materialism. Study 3 uses a daily diary methodology to examine the relationship between boredom and consumption in everyday life. Participants from the United Kingdom and Poland reported their daily consumption-related activities, while their experienced boredom was measured at the end of each day. This design allows us to investigate whether engaging in consumption during the day predicts end-of-day boredom and whether this association is moderated by individual differences in materialism. By

capturing naturally occurring behaviors across multiple days, this study provides ecologically valid evidence about the everyday relationship between boredom and consumption.

Preregistered online Study 4a explores whether a novel boredom manipulation based on auction clocks (Kocimska-Bortnowska et al., 2026b) not only affects the level of participants' boredom, but also increases their desire to engage in meaningful activity. This manipulation was further used in preregistered online Study 4b, conducted in a 2 (boredom: high vs. low) $\times$ 2 (exposure to buying opportunities: present vs. absent) design. This design allows us to test whether exposure to buying opportunities alleviates boredom and meaning deficits following boredom induction and whether these effects are stronger among individuals higher in materialism.

Transparency Statement

This project adheres to ethical guidelines specified in the APA Code of Conduct and the Declaration of Helsinki, and was approved by the Ethics Committee of Psychological Research at the Faculty of Psychology in Wroclaw, SWPS University (Decision 03/P/04/2022). Across studies, all participants provided informed consent within the survey system. Across studies, we report how we determined our sample size, any data exclusions, and all measures, and we followed JARS (Kazak, 2018). All data, analysis codes for Studies 2, 3, 4a-4b, and preregistrations for Studies 2, 4a-4b are available at <https://researchbox.org/6932> (CODE: YXIEKS). Data analysis was conducted using Jamovi 2.7.13 and Mplus 8.10.

Study 1. Methodological aspects of manipulating boredom. Systematic review

The scientific study of boredom has been dominated by non-experimental work, including research on trait boredom (Vodanovich & Watt, 2015), experience sampling studies of boredom in everyday life (Chan et al., 2018), and analyses of boredom in specific contexts such as work or education (Goetz et al., 2023; van Hooff & Hooft, 2014). Experimental research has developed more slowly, likely due to the limited availability of validated boredom inductions, despite the growing number and refinement of boredom measures (Fahlman et al., 2013; Struk et al., 2017; Tam, Van Tilburg, & Chan, 2021).

In recent years, however, experimental work on boredom has increased (e.g., Belinda et al., 2024; Finkielsztejn, 2024; Gorelik & Eastwood, 2024). These studies typically compare a high-boredom condition with a low-boredom or neutral control condition. Because boredom is associated with several negative experiences—such as anger, depression, and anxiety (e.g., anger, depression, and anxiety; Van Tilburg & Igou, 2012), it is important to determine whether these outcomes are caused by boredom itself. Experiments are particularly valuable in this regard: random assignment to conditions helps control for confounding variables and strengthens internal validity, allowing researchers to infer whether observed effects are indeed due to the boredom induction.

Although a wide range of tasks has been developed to induce boredom, these paradigms differ considerably in how well they meet the methodological requirements for experimentally isolating boredom. That is why we decided to commence this dissertation by exploring the effectiveness of boredom manipulations in various conditions. With this end in view, we conducted a systematic review of the manipulations used in the boredom studies.

Method

We performed a Scopus title/abstract/keyword search (as of 28 October, 2025), on peer-reviewed articles published in English using the following search string: (bored*) AND

(manip* OR experim*). This search procedure originally generated 1,284 hits. After screening the title and abstract, we excluded 1,199 irrelevant entries. Further analysis of the 85 remaining full texts identified 55 papers with 83 studies in which boredom was manipulated (see Figure 1). In eight of them, no control/comparison condition was included, such that all participants were subjected to boredom induction. Among the remaining 75, 62 were conducted in the between-subjects design, and 13 were conducted in the within-subjects design. Table 1 presents the summary of all studies identified.

Figure 1

PRISMA flow diagram of the systematic review on boredom manipulations procedure

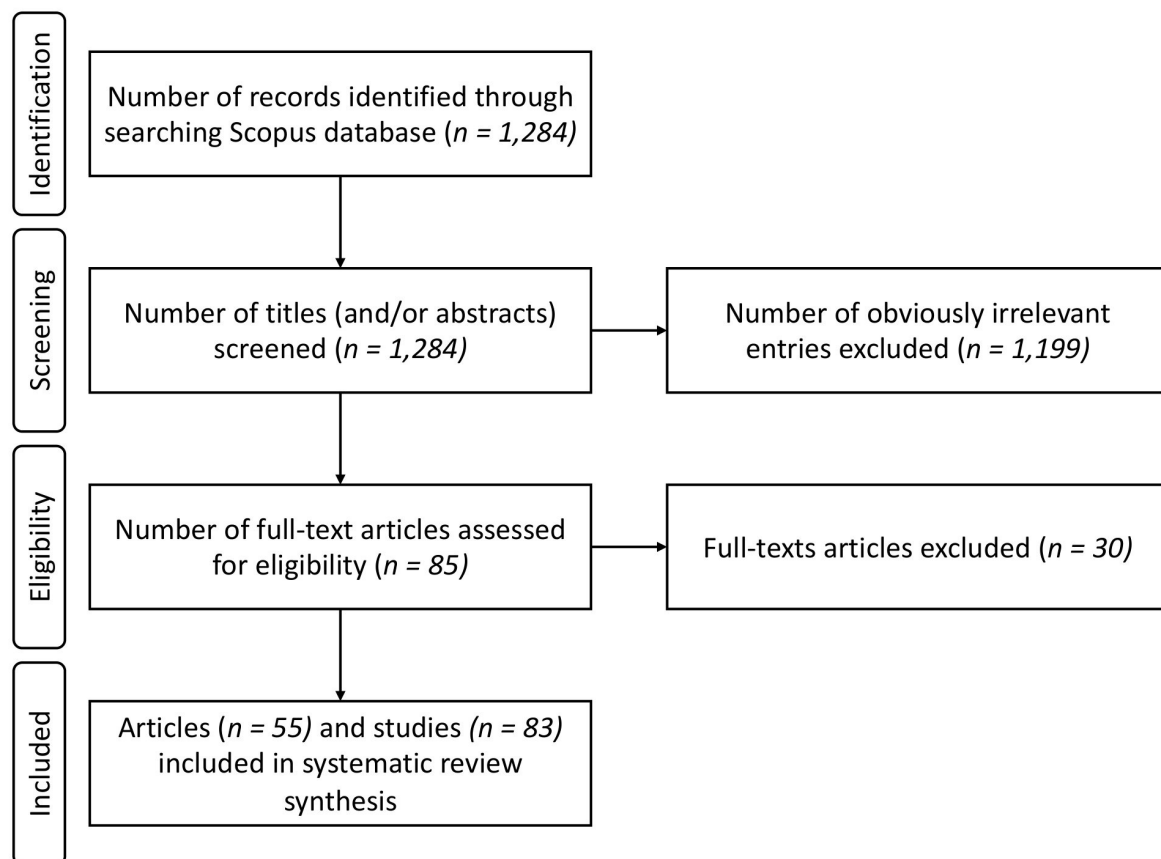


Table 1*The papers included in a systematic review on boredom manipulations*

	Reference	Study within the paper	Category	Manipulation	Design
				type	
1	Allen, 1980	S1	non-equivalent or confounded manipulations	A	B
2	Bailey et al., 1976	S1	non-equivalent or confounded manipulations	A	B
3	Belinda et al., 2024	S2	content-based manipulations	P	B
4	Bench & Lench, 2019	S1	no control condition	P	-
5	Bench & Lench, 2019	S2	quantity-based manipulations	P	B
6	Bieleke et al., 2021	S1	quantity-based manipulations	A	B
7	Bowman & Tamborini, 2015	S1	no control condition	A	-
8	Boyle et al., 1993	S1	delay vs. no delay	P	B
9	Chao et al., 2024	S1	non-equivalent or confounded manipulations	M	W
10	Chapman et al., 2014	S1	content-based manipulations	P	W

Reference	Study		Category	Manipulation type	Design
	within the paper				
11 Danckert et al., 2018	S1	content-based manipulations		P	W
12 Danckert & Merrifield, 2018	S1	content-based manipulations		P	W
13 Drody et al., 2022	S1	content-based manipulations		P	B
14 Drody et al., 2022	S2	content-based manipulations		P	B
15 Goldberg & Todman, 2018	S1	non-equivalent or confounded manipulations		M	B
16 Gu et al., 2021	S2	content-based manipulations		A	B
17 Gu et al., 2021	S3	quantity-based manipulations		A	B
18 Havermans et al., 2015	S1	content-based manipulations		P	W
19 Havermans et al., 2015	S2	content-based manipulations		P	W
20 Hong et al., 2024	S2	delay vs. no delay		P	B

	Reference	Study		Manipulation type	Design
		within the paper	Category		
21	Hong et al., 2024	S3	delay vs. no delay	P	B
22	Horrey et al., 2017	S1	content-based manipulations	P	W
23	Hunter & Eastwood, 2018	S1	content-based manipulations	P	B
24	Hunter & Eastwood, 2021	S1	content-based manipulations	A	B
25	Hunter & Eastwood, 2021	S2	content-based manipulations	P	B
26	Hunter et al., 2016	S1	content-based manipulations	P	B
27	Hunter et al., 2016	S2	content-based manipulations	P	B
28	Kim et al., 2018	S1	no control condition	P	-
29	Kılıç et al., 2020	S2	no control condition	A	-
30	Kılıç et al., 2020	S3	no control condition	A	-
31	Kolas & von Mühlenen, 2024	S1	content-based manipulations	P	B

Reference		Study	Category	Manipulation type	Design
		within the paper			
32	Kubose, 1972	S1	content-based manipulations	P	B
33	London et al., 1972	S1	non-equivalent or confounded manipulations	A	B
34	London et al., 1972	S2	non-equivalent or confounded manipulations	A	B
35	Markey et al., 2014	S1	non-equivalent or confounded manipulations	M	B
36	Markey et al., 2014	S2	non-equivalent or confounded manipulations	M	B
37	Martarelli et al., 2024	S1	delay vs. no delay	P	W
38	Mercer-Lynn et al., 2014	S1	content-based manipulations	P	B
39	Merrifield & Danckert, 2014	S1	content-based manipulations	P	W
40	Mlynski et al., 2025	S1	content-based manipulations	P	B
41	Moynihan et al., 2017	S3	quantity-based manipulations	A	B

Reference	Study		Category	Manipulation type	Design
	within the paper				
42 Müller-Boysen et al., 2025	S1	content-based manipulations		P	B
43 Nederkoorn et al., 2016	S1	content-based manipulations		P	B
44 O’Dea et al., 2024	S3	quantity-based manipulations		A	B
45 Park et al., 2019	S1	content-based manipulations		A	B
46 Park et al., 2019	S2	content-based manipulations		A	B
47 Park et al., 2019	S3	content-based manipulations		A	B
48 Perrin-Wallqvist et al., 2004	S1	non-equivalent or confounded manipulations		M	B
49 Pfattheicher et al., 2021	S6	content-based manipulations		P	B
50 Pfattheicher et al., 2021	S7	content-based manipulations		P	B
51 Pfattheicher et al., 2021	S8	content-based manipulations		P	B

Reference		Study	Category	Manipulation type	Design
		within the paper			
52	Pfattheicher et al., 2021	S9	content-based manipulations	P	B
53	Pirla & Navarro-Martinez, 2022	S1	non-equivalent or confounded manipulations	M	B
54	Pirla & Navarro-Martinez, 2022	S2	quantity-based manipulations	A	B
55	Pirla & Navarro-Martinez, 2022	S3	content-based manipulations	M	B
56	Pirla & Navarro-Martinez, 2022	S4	content-based manipulations	P	B
57	Raes et al., 2024	S1	no control condition	A	-
58	Rodin, 1975	S2	content-based manipulations	P	B
59	Shi et al., 2025	S1	quantity-based manipulations	A	B
60	Spencer-Mueller & Fenske, 2024	S1	no control condition	P	-
61	Spencer-Mueller & Fenske, 2024	S2	no control condition	P	-
62	Stone et al., 2023	S1	delay vs. no delay	P	B

Reference		Study	Category	Manipulation type	Design
		within the paper			
63	Stone et al., 2024	S1	content-based manipulations	P	B
64	Tam & Inzlicht, 2024	S1	content-based manipulations	P	W
65	van Aart et al., 2010	S1	delay vs. no delay	P	W
66	Van Hooft & van Hooff, 2018	S2	quantity-based manipulations	A	B
67	Van Tilburg & Igou, 2011	S1	non-equivalent or confounded manipulations	M	B
68	Van Tilburg & Igou, 2011	S2	quantity-based manipulations	A	B
69	Van Tilburg & Igou, 2011	S3	quantity-based manipulations	A	B
70	Van Tilburg & Igou, 2011	S4	quantity-based manipulations	A	B
71	Van Tilburg & Igou, 2011	S5	quantity-based manipulations	A	B
72	Van Tilburg & Igou, 2012	S4	quantity-based manipulations	A	B

Reference	Study		Category	Manipulation type	Design
	within the paper				
73 Van Tilburg & Igou, 2016	S1	quantity-based manipulations		A	B
74 Van Tilburg & Igou, 2017b	S1	non-equivalent or confounded manipulations		M	B
75 Van Tilburg & Igou, 2017b	S2	quantity-based manipulations		A	B
76 Woods & Miltenberger, 1996	S1	non-equivalent or confounded manipulations		P	W
77 Yao et al., 2023	S1	content-based manipulations		P	B
78 Yao et al., 2023	S2	content-based manipulations		P	B
79 Yusoufzai et al., 2024	S1	non-equivalent or confounded manipulations		A	B
80 Yuvaraj et al., 2025	S1	combined manipulations		P	W
81 Zhang et al., 2024	S1	quantity-based manipulations		A	B
82 Zhang et al., 2024	S2	content-based manipulations		P	B

Reference	Study		Category	Manipulation type	Design
	within the paper				
83 Zhang et al., 2024	S3	content-based manipulations		P	B

Note. A = active manipulation, P = passive manipulation, M = mixed manipulation, B = between-subject design, W = within-subject design.

Results

In our systematic review, we identified five major families of methods for inducing boredom. The first category consists of quantity-based monotony manipulations (16 studies). These procedures elicit boredom by increasing the amount or duration of simple, repetitive, low-engagement tasks. For example, several studies required participants to copy a large number of bibliographic references or to complete extended sets of highly repetitive perceptual trials, with shorter versions of the same tasks used as low-boredom controls (e.g., Van Tilburg & Igou, 2011, 2012, 2016; Moynihan et al., 2017; Shi et al., 2025). In these paradigms, boredom arises primarily from task quantity, rather than task content or meaning.

A second category includes content-based manipulations that contrast interesting and uninteresting materials of equal duration (38 studies). These approaches hold exposure time constant while varying the intrinsic engagement of the material. Typical examples include pairing a monotonous or dry video with an identically long but compelling nature documentary, or presenting unengaging textbook excerpts alongside narrative fiction of the same length (e.g., Danckert et al., 2018; Danckert & Merrifield, 2018; Hunter & Eastwood,

2018; Chapman et al., 2014; Belinda et al., 2024). Here, boredom emerges from content quality, not duration.

A third category comprises combined manipulations that vary both task quantity and content attractiveness (one study). The high-boredom condition involved lengthy or numerous trials paired with uninteresting content, whereas the low-boredom condition offered shorter exposure to more engaging material (Yuvaraj et al., 2025). This design induces boredom through the joint effects of prolonged monotony and reduced intrinsic interest, in contrast to a condition that is simultaneously shorter and more stimulating.

A fourth category consists of waiting-based manipulations (six studies). In some studies, boredom was induced by inserting a waiting period before the main procedure, with the control condition beginning immediately (e.g., Boyle et al., 1993; Hong et al., 2024; Stone et al., 2023). In others, the quality of waiting was manipulated—for instance, by presenting a slowed clock in the boring condition and an accelerated one in the control condition (Martarelli et al., 2024).

Finally, we identified a set of methodologically confounded manipulations in which the boredom and control conditions differ on multiple uncontrolled dimensions beyond interest level (fourteen studies). These include paradigms in which boredom is induced through prolonged waiting, reduced sensory stimulation, or restricted choice, contrasted with control conditions that differ substantially in modality, arousal, or cognitive load (e.g., Hong et al., 2024; Stone et al., 2023; Park et al., 2019; London et al., 1972; van Aart et al., 2010). Because these manipulations introduce multiple confounding differences, effects observed in such studies cannot be attributed solely to boredom.

These five categories capture the dominant methodological strategies used to elicit boredom, but a further distinction is needed: whether the manipulation task is passive or active (see Table 1). Passive manipulations (44 studies), such as waiting, watching dull

videos, reading boring material, or listening to monotonous audio clips (e.g., Belinda et al., 2024; Horrey et al., 2017; Hunter & Eastwood, 2018; Yao et al., 2023), are undeniably effective but do not prevent participants from employing various strategies to alleviate boredom, such as redirecting attention to previously overlooked elements of the environment (Sansone et al., 1992), redefining the activity—to find and specify a more meaningful purpose (Sansone et al., 1989), or disengaging attentionally through different activities (Eastwood et al., 2012), including mind wandering (Martarelli et al., 2021; Weibel et al., 2018). By contrast, the active boredom manipulations (27 studies), such as transcribing references (e.g., Bieleke et al., 2021; Moynihan et al., 2017; O’Dea et al., 2024; Van Tilburg & Igou, 2011, 2012, 2016), drawing lines or spirals (e.g., van Hooff & Hooft, 2014; Van Tilburg & Igou, 2011) or counting letters or objects (e.g., Zhang et al., 2024) preclude these coping strategies. They also evoke generic boredom and allow quantification of the level of engagement and performance during the task itself, which passive boredom inductions do not offer. Seven remaining studies applied a mixed approach, in which one condition had an active manipulation, and the other condition had a passive manipulation (Chao et al., 2024; Goldberg & Todman, 2018; Markey et al., 2014; Perrin-Wallqvist et al., 2004; Pirla & Navarro-Martinez, 2022).

In sum, although a wide range of tasks has been developed to induce boredom, these paradigms differ considerably in how well they meet the methodological requirements for experimentally isolating boredom. As shown in our systematic review of boredom manipulations, existing inductions cluster into a small number of methodological families that vary not only in their surface features but also in the degree of experimental control they afford.

Our review highlights two challenges common to experimental research on emotion and motivation, and one that is particularly salient to boredom research. General challenges

include separating boredom from correlated states such as low arousal, negative affect, cognitive fatigue, or task difficulty, and equating experimental conditions on dimensions other than the target state. A challenge more specific to boredom research stems from boredom's defining motivational tendency: the urge to disengage and regulate one's experience.

Although passive boredom inductions—such as waiting or exposure to uninteresting materials—dominate the literature, they afford participants substantial opportunities for attentional disengagement, mind wandering, or reappraisal, thereby weakening experimental control and complicating causal inference. In such paradigms, researchers have limited control over how participants cope with boredom in either the experimental or control condition. By contrast, active, quantity-based monotony manipulations, in which participants perform the same task but differ only in the *amount* of low-engagement activity required, constitute a smaller but methodologically more constrained subset of paradigms. For these reasons, we consider active manipulations preferable to passive ones for experimental boredom research. Accordingly, we selected reference transcription as the focal boredom induction for the present research, as it was the most frequently used manipulation within this class of active, quantity-based paradigms in the literature we reviewed.

However, even active, quantity-based monotony manipulations carry their own methodological risks. As we demonstrated in a recent paper (Kocimska-Bortnowska et al., 2026a), such manipulations may inadvertently activate boredom's defining motivational feature: the urge to disengage from the ongoing activity. Because boredom is associated with reduced perceived meaning, a desire to pursue more satisfying alternatives, and impulsivity (Bench & Lench, 2013; Havermans et al., 2015; Moynihan et al., 2017), participants in high-boredom conditions may attend less carefully to the task or withdraw from the study altogether. Critically, this disengagement does not affect all conditions equally: participants

in high-boredom conditions are disproportionately likely to drop out relative to those in low-boredom control conditions, leaving a non-representative sample of successfully non-bored participants in the high-boredom cell. This differential attrition threatens the internal validity that is otherwise the primary advantage of experimental designs, and may lead to underestimation of boredom's true effects on behavior.

Based on a systematic comparison of contextual factors, we identified several conditions that mitigate these risks (Kocimska-Bortnowska et al., 2026a). Laboratory settings substantially reduced differential dropout relative to online environments, likely because higher opportunity costs of disengagement and stronger situational norms of commitment increased task persistence even under boring conditions. Conducting the manipulation task in participants' native language further improved data quality, as tasks presented in a foreign language introduced additional cognitive load that confounded boredom with fatigue — a pattern consistent with attentional accounts linking boredom to impaired sustained attention (Eastwood et al., 2012). Importantly, making compensation salient and adequate appeared to support study completion, whereas explicitly tying payment to performance did not reliably improve data quality or strengthen the manipulation's effectiveness. Taken together, these findings suggest that the most methodologically sound active boredom inductions are those conducted in laboratory settings, using cognitively manageable tasks presented in participants' native language, with clearly communicated and adequate—but not necessarily performance-contingent—compensation.

Study 2. Boredom triggers excessive buying. A Laboratory Experiment.

In Study 2, we aimed to provide initial evidence that boredom triggers excessive buying. To this end, based on the conclusions from Study 1, we conducted a laboratory experiment with compensation, in which we aimed to measure trait boredom and materialism, and to evoke momentary boredom using the manipulation chosen based on the results of Study 1. On the basis of Study 1, to manipulate boredom we chose reference transcription (Van Tilburg & Igou, 2011, 2012, 2016). This method represents an active manipulation, in which boredom is varied quantitatively rather than qualitatively: participants in the high-boredom condition perform more repetitions of the same low-meaning task than participants in the control condition. Such a design minimizes differences between conditions in task type, stimulus modality, and task structure, thereby reducing the risk that observed effects reflect factors other than boredom.

We further selected this manipulation because it targets generic boredom rather than context-specific or situationally bound variants. The reference transcription task is inherently low in meaning and challenge—partly because a substantial portion of the retyped material consists of arbitrary strings of letters and numbers, which reliably diminishes participants' sense of meaning (Van Tilburg & Igou, 2011, 2012, 2017a). At the same time, the repetitiveness and understimulation associated with this task impair sustained attention (Eastwood et al., 2012; Tam, Van Tilburg, Chan, et al., 2021; Westgate & Wilson, 2018) and reduce perceived agency, as participants may feel trapped in an aversive activity and unable to pursue alternative goals (Gorelik & Eastwood, 2024). These features align with major theoretical accounts of boredom and make the task well-suited for eliciting boredom as a general affective–motivational state.

As a reward for participation in this experiment, participants received five play banknotes which they could spend in a mock “shop” located in the room next door to the

laboratory, or put as tickets into a raffle to draw for a highly valuable reward (a university sweatshirt in size and color of their choice). The "shop" offered a range of small, visually attractive items with limited practical value, including novelty stationery (e.g., decorative notebooks, bookmarks), accessories (e.g., keychains, enamel pins, small puzzles), and small decorative objects (e.g., miniature figurines). These items were selected to be appealing and varied in appearance while remaining low in functional utility, making them suitable proxies for hedonic excessive purchasing behavior. We hypothesized that (H1) participants in the high (vs. low) boredom condition will choose to spend more banknotes (obtained as remuneration for their participation in the study) on purchasing items instead of saving them for a potentially bigger reward later. We also expected that (H2) the relationship between boredom level and excessive shopping would be moderated by trait materialism, such that it would be stronger for people scoring higher (vs lower) in materialism. Finally, we predicted that (H3) this main relationship will also be moderated by trait boredom, such that it would be stronger for people scoring higher (vs lower) in boredom proneness¹. We preregistered this study's hypotheses, measures, manipulations, analysis, design, and sample size at <https://aspredicted.org/td3je3.pdf>.

Procedure and participants

We calculated our sample size assuming a weak effect size of boredom manipulation, that is $\eta^2 = .05$. While previous empirical investigations utilizing identical induction protocols reported substantially larger effects (e.g., Van Tilburg & Igou, 2011, 2016), the present study adopted this more stringent threshold to account for the phenomenological fragility and transient nature of the boredom state. By assuming a smaller effect size, the study design aimed to ensure sufficient sensitivity to detect the target construct despite its

¹ Due to an error, we preregistered analyses with those moderators, but failed to include them in the hypotheses section.

inherent instability and potential for rapid decay. A priori power analyses using G*Power (Faul et al., 2007) revealed that given $\alpha = .05$ and a conventionally assumed power of .80, a total sample of 150 participants would be required to detect such an effect. However, because we were mostly interested in the interaction between boredom manipulation and materialism and trait boredom, we decided to double the sample size, and we planned to recruit a total of 300 participants.

We recruited a total of $N = 306$ participants (213 women, 85 men, 8 others; age $M = 25.60$, $SD = 7.92$). Although we did not preregister any exclusion criteria, we decided to exclude the participants who did not follow the experimental instructions properly (did not rewrite any reference; $n = 3$), and participants whose identification information from the first part of the study did not match the information provided in raffle in the second part of the procedure ($n = 6$). Our final sample included $N = 297$ participants (82 men, 209 women, 6 others; age $M = 25.60$, $SD = 7.90$).

The experiment took part on the premises of the SWPS University in Wrocław, Poland. The first part of the study took place in a computer laboratory. After entering the laboratory and being seated, participants were given a closed envelope filled with five play banknotes (the remuneration for participating in the study). Their first task was to complete a computerized survey. After providing informed consent and answering demographic questions, participants completed two scales presented in a random order. The first one was the Materialistic Values Scale (MVS; English version: Richins & Dawson, 1992; Polish version Górnik-Durose, 2016). It consists of 15 statements (e.g., “It sometimes bothers me quite a bit that I can’t afford to buy all the things I’d like,” “I like a lot of luxury in my life,” “I’d be happier if I could afford to buy more things.”) with responses on a scale from 1 = strongly disagree to 5 = strongly agree. The second one was the Short Boredom Proneness Scale (SBPS; English version: Struck et al., 2017; Polish version: Kocimska-Bortnowska &

Gasiorowska, 2026). It contains eight statements (e.g., “I find it hard to entertain myself.”, “Unless I am doing something exciting, even dangerous, I feel half-dead and dull.”, “Many things I have to do are repetitive and monotonous.”) with a response scale from 1 = strongly disagree to 7 = strongly agree. The order of questions within both scales was randomized.

After filling in the questionnaires, the participants were randomly assigned to one of two conditions in a between-subjects design and asked to read a text and rewrite it quickly and accurately (Van Tilburg & Igou, 2011, 2012, 2016). In the high-boredom condition ($n = 150$), the text consisted of six references in Polish from a study of concrete, whereas in the control condition ($n = 146$), participants were provided with two references to rewrite. We provided the references as a non-editable picture to avoid copying and pasting (see Figure 2).

Figure 2

Pictures of references used as a boredom manipulation - high boredom condition (A) and low boredom condition (B)

- A** D.Olędzka, A.Węglarz, K.Żmijewski: Projektowanie polioptymalnych budynków przyjaznych środowisku, *Izolacje*, 9/2007, s. 22–24.
S.Wierzbicki: Budownictwo a stały rozwój środowiska ludzkiego. VII Ogólnopolska Interdyscyplinarna Konf. Nauk.-Tech.: Ekologia a budownictwo, 1985, s. 19–27.
M. Stienss, J. Judycki: Mieszanki mineralno-asfaltowe na ciepło – przegląd dodatków, *Drogownictwo* 7-8, 2010.
Glinicki A., Litorowicz A., Zieliński M.: Badanie odporności fibrobetonów na pękanie przy zginaniu. “Materiały Budowlane”. Nr 3/2002, 74-76.
Ablewicz Z., Dubrowski W.B. (1986) Osłony przed promieniowaniem jonizującym. Arkady, Warszawa, s. 300.
Abramowicz M., Ciało A. (1975b) Rozszerzalność liniowa betonów osłonowych. *Arch. Inż. Łąd.*, 21, 4, 667–677.
- B** D.Olędzka, A.Węglarz, K.Żmijewski: Projektowanie polioptymalnych budynków przyjaznych środowisku, *Izolacje*, 9/2007, s. 22–24.
S.Wierzbicki: Budownictwo a stały rozwój środowiska ludzkiego. VII Ogólnopolska Interdyscyplinarna Konf. Nauk.-Tech.: Ekologia a budownictwo, 1985, s. 19–27.

After completing this task, participants were informed that, as remuneration for participating in the study, they were given five play banknotes in the envelope that was handed in at the beginning, and that they could spend them in the “shop” next door. In a

neighboring laboratory, we have arranged a small shop (See Figure 3) offering a variety of small, impractical toys (e.g., rubber ducks, marbles, stickers, toy cars, bookmarks, little animal figurines), priced at one or two banknotes². The participants were instructed that they could either buy some of the toys from the shop or use the banknotes as lottery tickets in a raffle for a university sweatshirt. They could also divide their banknotes between those two purposes.

Figure 3

The experimental setup of a shop arranged as an excessive buying measure in Study 2



To prevent confounds stemming from communication between participants, they were asked to go to the “shop” one by one. They were also instructed by the experimenter managing the shop that they had two minutes to decide how to allocate the banknotes, and that during that time they could only look at the products; they could not touch or play with them. That measure was crucial for maintaining a rather fragile state of boredom evoked in

² The toys’ prices were established based on a pilot study conducted online via Prolific with a Polish sample ($N = 40$; 20 men, 20 women; age $M = 29.80$, $SD = 6.85$). In the pilot study, participants were asked to imagine completing a 10-minute laboratory study for an endowment of five experimental banknotes, which could be spent on small items or used for lottery tickets. After being shown a reference item (a sticker set worth one banknote), participants estimated the value of 16 other items on a scale from 1 to 5. The final prices used in the main laboratory study were based on the mean ratings obtained from this pilot.

the first part of the study. Participants who decided to enter the raffle placed their banknotes in an envelope, wrote their participant ID—the same one used in the first part of the study—and deposited the envelope in a ballot box. Those who chose to spend their banknotes in the shop received the selected items immediately. This concluded the experimental session. The number of banknotes spent on shop items served as the dependent variable, with higher values reflecting greater engagement in excessive hedonic purchasing behavior.

Results and discussion

Table 2 presents descriptive statistics and zero-order correlations between all the variables measured in the study.

Table 2

Descriptive statistics and zero-order correlations between the variables measured in Study 2

Variable	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6
1. Trait materialism	45.70	8.26	.80	-					
2. Trait boredom proneness	24.70	9.30	.82	-.31***	-				
3. State boredom	3.56	1.68	-	-.18**	.20***	-			
4. State happiness	4.30	1.46	-	.12*	-.30***	-.18**	-		
5. State sadness	2.69	1.45	-	-.03	.22***	.19**	-.46***	-	
6. Banknotes spent on immediate purchases	1.24	1.71	-	.04	-.03	.11	.07	.02	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Manipulation checks

We first verified the effectiveness of the experimental manipulation by comparing the reported feelings of boredom, happiness, and sadness across conditions. We found a significant effect of boredom manipulation on the reported level of state boredom after manipulation task, $t(294) = -3.48$, $p < 0.001$, $d = -0.40$, such that participants from the high-boredom condition reported higher levels of boredom ($M = 3.89$, $SD = 1.61$) than those in the

low-boredom condition ($M = 3.23$, $SD = 1.68$). We also found significant but weaker differences between conditions for the feeling of happiness, $t(294) = 2.54$, $p = .012$, $d = 0.30$, such that participants in the high-boredom condition felt less happy ($M = 4.09$, $SD = 1.49$) than those in the low boredom condition ($M = 4.52$, $SD = 1.40$). We did not find significant differences between the conditions for the feeling of sadness, $t(294) = 0.39$, $p = .697$, $d = 0.05$ (respectively $M = 2.65$, $SD = 1.42$ in the high boredom condition and $M = 2.72$, $SD = 1.48$ in the low boredom condition). This pattern of results provides initial support for the effectiveness of the manipulation.

In the second step, we conducted a multiple linear regression analysis with condition (high boredom vs. low boredom) a predictor of reported state boredom, while controlling for participants' levels of happiness and sadness. The overall model was significant, $R^2 = .08$, indicating that 8.2% of the variance in boredom was explained by the predictors. Boredom manipulation was a significant predictor of reported state boredom, $\beta = .38$, $SE = .11$, 95% CI [.16, .61], $t(292) = 3.35$, $p < .001$. We also found a significant effect of sadness, $\beta = .16$, $SE = .06$, 95% CI [.03, .28], $t(292) = 2.48$, $p = .014$, indicating that higher levels of sadness were associated with greater reported boredom. In contrast, happiness was not related significantly to boredom, $\beta = -.08$, $SE = .06$, 95% CI [-.21, .05], $t(292) = -1.23$, $p = .220$.

In sum, the experimental manipulation constituted the strongest predictor in the model, with an effect size more than twice as large as that observed for sadness, while happiness showed only a negligible and non-significant association with boredom. This pattern is consistent with the literature on boredom, which states that sadness is one of the main emotional correlates of boredom, differing mainly on the ratings of perceived challenge (Van Tilburg & Igou, 2017a), which is one of the main components of boredom targeted by our manipulation.

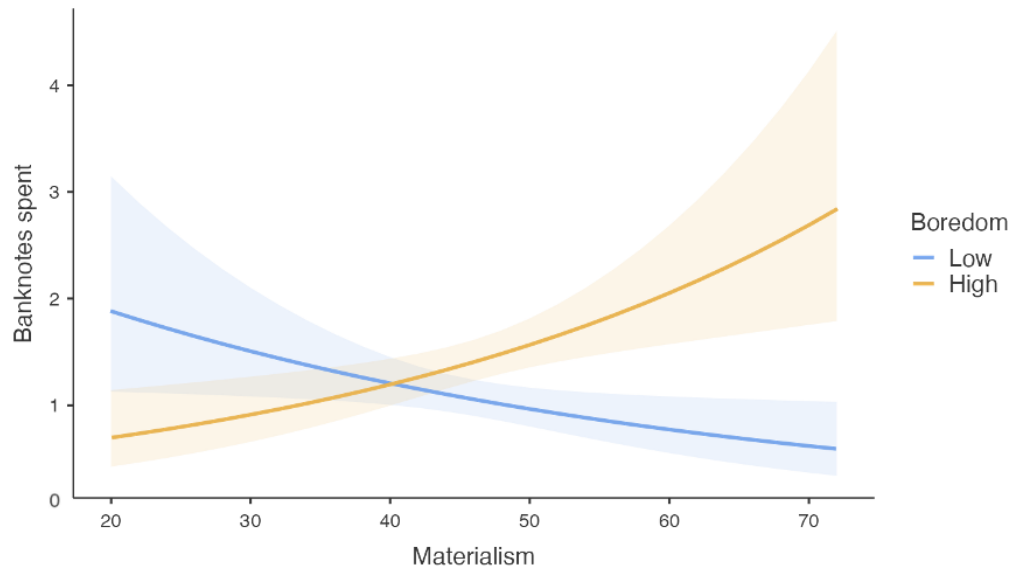
Hypotheses testing

Our outcome variable follows a discrete count distribution restricted to integer values (0 to 5) and exhibits significant right-skewness, with a high frequency of zero-value observations. Given that these distributional characteristics violate the assumptions of normality and homoscedasticity required by the general linear model, we instead conducted a Poisson regression. This approach more accurately models count-based data and accounts for the overrepresentation of zero-expenditure cases within the sample. In this regression analysis, we included boredom manipulation as a predictor, trait boredom proneness (SBPS), and materialism (MVS) as a moderator, and the number of play banknotes spent on purchasing as a dependent variable.

The model was statistically significant, $\chi^2(5) = 25.8, p < .001, R^2 = 3.5\%$. The effect of boredom manipulation was significant and in line with our hypothesis, $B = 0.28, SE = 0.11, z = 2.59, p = .010, \text{Exp}(B) = 1.32, 95\% \text{ CI } [1.07, 1.62]$, such that participants in the experimental condition spent 32% more banknotes than those in the control condition. The main effects for boredom proneness and materialism were not significant, respectively $B = 0.001, SE = 0.01, z = 0.08, p = .935, \text{Exp}(B) = 1.00, 95\% \text{ CI } [0.99, 1.01]$ and $B = 0.002, SE = 0.01, z = 0.35, p = .723, \text{Exp}(B) = 1.00, 95\% \text{ CI } [0.99, 1.02]$. We did not observe a significant interaction between boredom manipulation and trait boredom proneness, $B = -0.01, SE = 0.01, z = -0.84, p = .399, \text{Exp}(B) = 0.99, 95\% \text{ CI } [0.97, 1.01]$, indicating that participants' reaction to boredom manipulation in terms of excessive buying was not contingent on their boredom proneness. Most importantly, however, we found a significant interaction between boredom manipulation and materialism, $B = 0.05, SE = 0.01, z = 3.66, p < .001, \text{Exp}(B) = 1.05, 95\% \text{ CI } [1.02, 1.08]$ (see Figure 4). This interaction suggests that the effect of the boredom manipulation on spending behavior was contingent on individuals' levels of materialism.

Figure 4

The number of banknotes spent by the participants on the immediate small purchases as a function of their materialism and boredom manipulation. Shaded regions represent 95% CIs



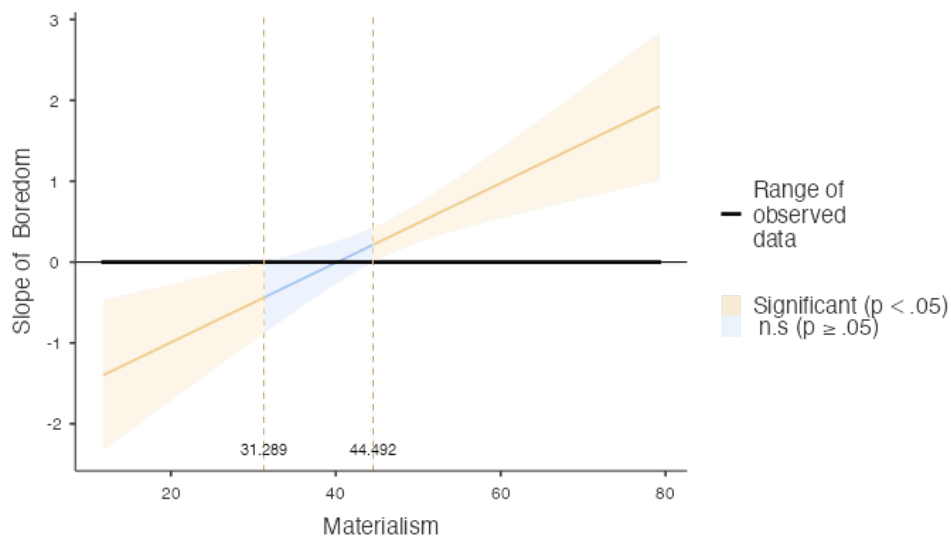
To interpret the interaction, we first decomposed it using a pick-a-point approach, evaluating the effect of the boredom manipulation on excessive buying at three levels of materialism: one standard deviation below the mean ($M - 1\ SD = 37.55$), at the mean ($M = 45.78$), and one standard deviation above the mean ($M + 1\ SD = 54.02$). For participants with low levels of materialism, we did not observe a significant effect of boredom manipulation on excessive buying, $B = -0.13$, $SE = 0.15$, $z = -0.84$, $p = .400$, $\text{Exp}(B) = 0.88$, 95% CI [0.65, 1.19]. Importantly, this effect was significant for participants with average levels of materialism, $B = 0.28$, $SE = 0.11$, $z = 2.59$, $p = .010$, $\text{Exp}(B) = 1.32$, 95% CI [1.07, 1.62], such that those in the boredom condition spent more banknotes than those in the control condition. This effect was even stronger for participants with high levels of materialism, $B = 0.68$, $SE = 0.15$, $z = 4.44$, $p < .001$, $\text{Exp}(B) = 1.98$, 95% CI [1.46, 2.67].

Additionally, we employed the Johnson-Neyman technique to identify the regions of the moderator (materialism), in which the conditional effect of the boredom manipulation reached statistical significance (see Figure 5). The analysis revealed two distinct regions of

significance: a lower region and an upper region. Specifically, the conditional effect of boredom manipulation on spending banknotes was statistically significant and positive when raw materialism scores exceeded 44.49 (-0.16 SD below the mean), negative when the raw materialism scores were below 31.29 (-1.76 SD below the mean). For participants with intermediate materialism scores (31.29 to 44.49), the effect of the boredom manipulation was non-significant. These results indicate that the influence of the boredom manipulation on the number of banknotes spent depends on the participant's level of materialism: the higher a participant's level of materialism, the more positive the conditional effect of the boredom manipulation. Additionally, the effect reverses direction for people scoring very low on materialism.

Figure 5

Johnson–Neyman regions of significance for the conditional effect of boredom on banknotes spent at different levels of materialism.



In sum, the results of Study 2 indicate that experimentally induced boredom triggers excessive buying operationalized as the purchase of non-necessary items, and that the strength of this association is contingent upon materialistic values. Boredom drives excessive

purchasing behavior especially among individuals with average-to-high materialistic orientations.

Study 3. Excessive buying lowers boredom. A daily diary study.

In Study 2, we demonstrated that inducing boredom triggers excessive buying in a laboratory setting, and that this effect was contingent on participants' materialism level. However, although this design affords internal validity and supports causal conclusions, it does not capture the richness of naturally occurring boredom experiences or the dynamics of real spending behavior. Therefore, in Study 2, we investigated the associations between excessive buying, state boredom, and materialism in a naturalistic setting, using a daily diary study. We used this method rather than experience sampling—which is more often used in boredom studies—because while boredom occurs frequently enough for experience sampling designs to pick it up (Lovitch, 2024), this method might not manage to collect sufficient buying-related behavior (although it could capture the occurrence of buying-related thoughts). Additionally, a diary study method was successfully implemented in a study by Moynihan et al. (2015), where the researchers explored the daily link between state boredom and calorie, fat, carbohydrate, and protein consumption in a week-long study.

Over two weeks, a large group of participants from Poland and the UK answered questions about their daily shopping behaviors and momentary boredom levels. Using a Multilevel Structural Equation Modelling Approach, we investigated whether momentary boredom in the evening was associated with excessive shopping that day, measured by the number of items purchased and the amount of money and time spent shopping or browsing in stores. We tested the main hypothesis (H1): the more excessive shopping participants report during the day, the lower their evening boredom levels. We also expected that (H2) this relationship would hold after controlling for momentary happiness and sadness. Moreover, we predicted that (H3) the relationship between excessive shopping and boredom would be

moderated by trait materialism, such that it would be stronger for people scoring higher (vs lower) in materialism. Finally, we expected that this pattern of results would hold in both countries.

Participants and procedure

As we had no expectations regarding effect sizes, we calculated our sample size based on our funding limits and decided to recruit 1000 participants in total. Therefore, we recruited a total of $N = 1006$ participants from two countries, $n_{Poland} = 501$ (243 men, 252 women, 6 others; age $M = 28.22$, $SD = 8.09$) and $n_{UK} = 505$ (251 men, 249 women, 5 others; age $M = 41.28$, $SD = 13.15$) to participate in the first part of the study in exchange for £1.05. All participants were then invited to join a 14-day diary study, with £0.30 paid for each completed short survey. For those who completed the daily measurements for more than 10 days, we offered an additional bonus of £1. Our final sample included $N = 927$ participants in the analyses who completed the T0 measurement and at least one daily measurement ($n_{PL} = 491$, 249 men, 237 women, 5 others; age $M = 28.20$, $SD = 8.15$; $n_{UK} = 436$, 214 men, 218 women, 4 others; age $M = 41.10$, $SD = 12.90$). No data were discarded.

At the very beginning of the survey, participants were informed that the study consisted of an initial 7-minute online questionnaire followed by a 14-day longitudinal project. Consent to participate included agreement to complete both phases of the study. After providing informed consent and answering demographic questions, participants completed the Materialistic Values Scale (English version: Richins & Dawson, 1992; Polish version: Górník-Durose, 2016) and the Short Boredom Proneness Scale (SBPS; English version: Struk et al., 2017; Polish version: Kocimska-Bortnowska & Gasiorowska, 2026) as part of the larger cross-sectional study. The order of questions was randomized. At the end of this survey, all participants were informed that the daily diary study would start the following day. Every evening for two weeks, at approximately 9 pm local time, participants received an

email reminding them to complete a short survey. Access to each daily survey was limited to 2 am on the following day.

Each daily survey included three sets of questions. First, participants were asked to indicate whether that day was a working or studying day, or a day off. The second set concerned excessive buying behaviors undertaken that day (both in-store and online). We explained that the question concerns unplanned purchases, understood as those they decide to buy on the spur of the moment, e.g., seeing something in the shop or thinking of buying it at the last minute. Specifically, participants reported: (1) time spent shopping, including the time spent on browsing even if no purchase was ultimately made (“How much time have you spent shopping today?” with a slider scale from 0 hours to 5 hours or more), (2) number of unplanned items purchased (“How many unplanned things did you buy today?” with a slider scale from 0 items to 15 items or more;), and (3) the amount of money spent on these unplanned purchases (“Please estimate how much money you have spent on those unplanned things”; open-ended question in £ or PLN, depending on the subsample). Next, participants who made unplanned purchases were asked to provide examples of those purchases (up to three items). In the third set, participants reported their feelings experienced that day. Specifically, they indicated their agreement with the following statements: “I felt bored today,” “I felt happy today,” and “I felt sad today,” using a scale from 1 = strongly disagree to 7 = strongly agree. At the end, participants were thanked and reminded of the upcoming survey the following day. The order of questions remained the same for each daily survey. All study materials were in English (for the UK sample) or Polish (for the Polish sample).

Results and discussion

Tables 3 and 4 present descriptive statistics and zero-order correlations between the variables measured in Study 3.

Table 3

Descriptive statistics and zero-order correlations between the variables measured in Study 3 – a total sample

Variable	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7
1. Trait materialism	43.90	9.05	.88	-						
2. Trait boredom proneness	26.40	10.20	.90	.25***	-					
3. Day-level time spent shopping	0.51	0.68	-	.05***	.03*	-				
4. Day-level number of items bought	1.00	1.79	-	.03**	-0.00	.39***	-			
5. Day-level money spent	29.90	249.00	-	.03**	-.01	.08***	.13***	-		
6. Day-level boredom	2.92	1.75	-	.12***	.32***	-.04***	-.04***	-.02	-	
7. Day-level happiness	4.40	1.58	-	-.14***	-.29***	.06***	.04***	.01	-.41***	-
8. Day-level sadness	2.71	1.69	-	-.12***	.28***	-.02	-.03*	.01	.38***	-.68***

Note. Trait-level data are person-level correlations ($N = 927$). Day-level data are day-level correlations ($N = 9432$).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4

Descriptive statistics and zero-order correlations between the variables measured in Study 3 – divided by country

Country	Variable	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7
Poland	1. Trait materialism	45.80	8.24	.85	-						
	2. Trait boredom proneness	27.50	10.10	.88	.19***	-					
	3. Day-level time spent shopping	0.51	0.65	-	.02	.01	-				
	4. Day-level number of items bought	0.97	1.66	-	.03**	-.01	.38***	-			
	5. Day-level money spent	41.5	311.00	-	.02	-.01	.09***	.16***	-		
	6. Day-level boredom	2.99	1.73	-	.05***	.25***	-.06***	-.05***	-.03	-	
	7. Day-level happiness	4.14	1.58	-	-.08***	-.21***	.06***	.05***	.01	-.37***	-
	8. Day-level sadness	2.91	1.71	-	.09***	.23***	-.02	-.02	.01	.36***	-.66***
UK	1. Trait materialism	41.40	9.45	.90	-						
	2. Trait boredom proneness	25.00	10.30	.91	.27***	-					
	3. Day-level time spent shopping	0.53	0.71	-	.09***	.05*	-				
	4. Day-level number of items bought	1.03	1.96	-	.04**	.01	.40***	-			
	5. Day-level money spent	14.6	124.00	-	.03	-.02	.09***	.11***	-		
	6. Day-level boredom	2.82	1.76	-	.19***	.41***	-.02	-.03*	-.01	-	
	7. Day-level happiness	4.73	1.51	-	-.11***	-.35***	.06***	.03*	.02	-.46***	-
	8. Day-level sadness	2.46	1.63	-	.10***	.33***	-.01	-.03	-.03*	.39***	-.71***

Note. Trait-level data are person-level correlations ($N_{Pl} = 491$, $N_{UK} = 436$). Day-level data are day-level correlations ($N_{Pl} = 5373$, $N_{UK} = 4059$).

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypotheses testing

We analyzed the data using multilevel structural equation modeling (MSEM) with a Bayesian estimator in Mplus 8.10. We considered the data as nested, because we had daily answers for multiple days for participants, thereby we included random intercept for participants, accounting for individual differences in momentary boredom in the evening.

Before testing our research hypothesis, we tested a measurement model in which the latent variable representing excessive buying was operationalized using three indicators: (1) time spent shopping, (2) number of items purchased, and (3) the amount of money spent on these purchases, both at the within and between participant levels. Because these indicators deviated from normal distributions and included zero values, they were transformed using $\log(X + 1)$. As the data came from two countries (Poland and the United Kingdom), the monetary amounts reported in the UK sample were multiplied by 3 to approximate differences in the purchasing power of GBP and PLN.

The measurement model was well-fitted to data, with 95% confidence interval for the difference between the observed and the replicated χ^2 values including 0, 95% CI [-18.88, 15.49], and a posterior predictive p-value of $ppp = .463$. All standardized factor loadings were higher than $\beta = .4$ ($ps < .001$), respectively, at the within-participant level: $\beta = .55$ for time, $\beta = .92$ for items bought, and $\beta = .92$ for money spent, and at the between-participant level: $\beta = .45$ for time, $\beta = .92$ for items bought, and $\beta = .99$ for money spent. This pattern of results attests to using a latent variable indicating excessive buying in our focal analysis.

Second, we have run an MSEM analysis in which excessive buying predicted boredom at both within- and between-participant levels, with materialism level as a moderator at the between-participant level. As we tested models that include interaction between latent variable (excessive buying) and observed variable (materialism), we could not obtain classic fit statistics. These are available only for models where means, variances, and

covariances are sufficient statistics for model estimation (Maslowsky et al., 2015; Muthén et al., 2017). The latent interaction term does not have a mean, variance, or covariance with other parameters, and thus should not affect the fit of the measurement model. Given this, we used a two-step method to assess each model's fit (A. G. Klein & Muthén, 2007; Maslowsky et al., 2015). First, we calculated the fit statistics values obtained from the null model (where the interaction is assumed to be zero). Second, we compared the relative fit of the null and alternative models using the Deviance Interaction Criterion. This test determines whether the more parsimonious null model represents a significant loss in fit relative to the more complex alternative model (Satorra, 2000; Satorra & Bentler, 2010). If the null model fits well and represents a significant loss in fit relative to the alternative model, then we can conclude that the alternative model is also well-fitted. In our case, the null model was well-fitted to the data, with 95% confidence intervals for the difference between the observed and replicated χ^2 values (95% CI: [-15.11, 26.04]), a posterior predictive p-value (*ppp*) of .305, and DIC = 64,404.91. The model with interaction had a better fit than the null model, DIC = 64,297.48, and hence was also well fitted to the data.

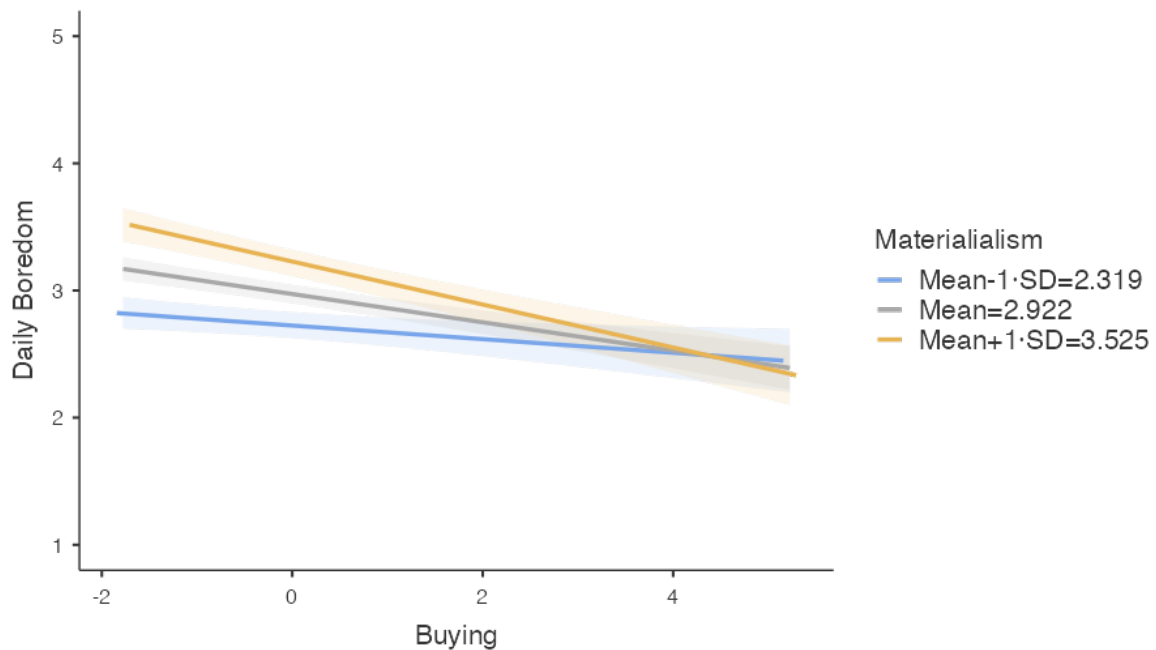
At the within-participant level, daily boredom was significantly and negatively linked with daily excessive buying, $b = -0.11$, $SE = 0.02$, 95% CI [-0.14, -0.07], $p < .001$, such that the more participants purchased on a specific day, the less bored they were in the evening. The respective link at the between-participant level was not significant, $b = -0.05$, $SE = 0.05$, 95% CI [-0.15, 0.05], $p = .374$; hence, average excessive buying was not related to average state boredom. However, both average excessive buying and average levels of boredom were significantly and positively associated with materialism, respectively, $b = 0.24$, $SE = 0.07$, 95% CI [0.10, 0.38], $p < .001$ for buying and $b = 0.39$, $SE = 0.06$, 95% CI [0.27, 0.52], $p < .001$ for boredom.

Additionally, we found a significant cross-level interaction between daily excessive buying and materialism on daily boredom, $b = -0.07$, $SE = 0.02$, 95% CI $[-0.15, -0.02]$, $p = .002$. The interaction between average excessive buying and materialism on average boredom on the between-participants level was not significant, $b = -0.10$, $SE = 0.08$, 95% CI $[-0.26, -0.05]$, $p = .182$.

Further decomposition of the cross-level interaction revealed that the link between daily excessive buying and boredom was significant and negative at low levels of materialism ($M - 1SD = 2.32$), $b = -0.06$, $SE = 0.03$, 95% CI $[-0.11, -0.001]$, $p = .042$, stonger at medium levels ($M = 2.92$), $b = -0.11$, $SE = 0.02$, 95% CI $[-0.14, -0.07]$, $p < .001$, and the strongest at high levels ($M + 1SD = 3.52$), $b = -0.15$, $SE = 0.03$, 95% CI $[-0.21, -0.10]$, $p < .001$ (see Figure 6).

Figure 6

Daily boredom level as a function of excessive buying that day and participants' materialism



In sum, we found that individuals with higher levels of materialism reported higher levels of boredom than those with lower levels of materialism, and that individuals who

engaged in more buying during a given day reported lower levels of boredom later that day than those who bought less. Importantly, the relationship between buying and boredom depended on the level of materialism. For highly materialistic individuals, buying was associated with a greater reduction in afternoon boredom. In contrast, among individuals low in materialism, the link between buying and reduced boredom was substantially weaker.

Robustness checks

Happiness and sadness as covariates

In the following analysis, we added two additional measures of emotion—namely, happiness and sadness—as potential confounders of the link between excessive buying and boredom at both the within- and between-participant levels. The results of the MSEM analysis are presented in Table 5.

At the within-participant level, daily excessive buying was significantly and negatively associated with daily sadness and positively associated with daily happiness. In turn, daily boredom was negatively associated with daily happiness and positively associated with sadness. After controlling for happiness and sadness as mediators, the direct negative link between excessive buying and boredom remained significant, attesting to the robustness of our findings.

At the between-participant level, average levels of boredom, happiness, and sadness were not associated with average levels of excessive buying. However, the average level of boredom was significantly associated with happiness (negatively) and sadness (positively). We also found significant associations between materialism and the average levels of boredom (positive), sadness (positive), and happiness (negative).

Table 5

Boredom as a function of excessive buying and participants' materialism controlling for happiness and sadness. Multilevel Structural Equation Model (Study 3).

Effects	<i>b</i>	Posterior <i>SD</i>	95% CI	<i>p</i>
Within Level Effects				
Excessive buying (D) → Boredom (D)	-0.07	0.02	[-0.11, -0.03]	.001
Excessive buying (D) → Happiness (D)	0.10	0.02	[0.06, 0.13]	.001
Excessive buying (D) → Sadness (D)	-0.07	0.02	[-0.11, -0.04]	.001
Happiness (D) → Boredom (D)	-0.36	0.02	[-0.39, -0.33]	.001
Sadness (D) → Boredom (D)	0.13	0.01	[0.10, 0.15]	.001
Between Level				
Happiness (A) → Boredom (A)	-0.19	0.05	[-0.29, -0.09]	.001
Sadness (A) → Boredom (A)	0.30	0.05	[0.21, 0.40]	.001
Materialism → Excessive buying (A)	0.23	0.08	[0.08, 0.38]	.004
Materialism → Boredom (A)	0.20	0.06	[0.09, 0.31]	.001
Excessive buying (A) → Boredom (A)	0.12	0.07	[-0.01, 0.26]	.074
Excessive buying (A) × Materialism → Boredom (A)	0.18	0.14	[-0.09, 0.44]	.198
Materialism → Happiness (A)	-0.40	0.06	[-0.52, -0.27]	.001
Excessive buying (A) → Happiness (A)	-0.01	0.04	[-0.10, 0.08]	.840
Excessive buying (A) × Materialism → Happiness (A)	-0.05	0.09	[-0.20, 0.13]	.582
Materialism → Sadness (A)	0.38	0.07	[0.24, 0.51]	.001
Excessive buying (A) → Sadness (A)	-0.09	0.07	[-0.25, 0.05]	.196
Excessive buying (A) × Materialism → Sadness (A)	-0.18	0.15	[-0.48, 0.11]	.228
Cross-level interactions				
Excessive buying (D) × Materialism → Boredom (D)	-0.08	0.03	[-0.13, -0.02]	.012
Excessive buying (D) × Materialism → Happiness (D)	0.02	0.03	[-0.03, 0.08]	.406
Excessive buying (D) × Materialism → Sadness (D)	0.03	0.03	[-0.03, 0.09]	.378

Note: D: daily level, A: Average level

Most importantly, the cross-level interaction between daily excessive buying and materialism in predicting daily boredom remained significant, whereas the respective interactions predicting daily happiness and sadness were not. Moreover, the interactions between average excessive buying and materialism predicting average boredom, happiness, and sadness at the between-participants level also remained nonsignificant.

In summary, this additional analysis, controlling for two other emotional dimensions measured in the study—happiness and sadness—confirmed the robustness of our results. First, the negative association between daily excessive buying and daily boredom remained significant. Second, this link was the only one moderated by the level of materialism.

Trait Boredom proneness as additional moderator

In the following analysis, we added trait boredom proneness to our focal analysis as another moderator operating at between-participant levels. The results of the MSEM analysis are presented in Table 6.

At the within-participant level, daily excessive buying remained significantly positively associated with daily boredom remained significant, attesting to the robustness of our findings.

At the between-participant level, average level of boredom was not associated with average levels of excessive buying. However, the average level of boredom was significantly associated with trait boredom proneness (positively). We also found significant associations between materialism and both trait boredom and the average levels of boredom (positive).

Table 6

Boredom as a function of excessive buying and participants' materialism and trait boredom.

Multilevel Structural Equation Model (Study 3).

Effects	<i>b</i>	Posterior <i>SD</i>	95% CI	<i>p</i>
Within Level Effects				
Excessive buying (D) → Boredom (D)	-0.11	0.02	[-0.17, -0.07]	.001
Between Level Effects				
Materialism → Excessive buying (A)	0.28	0.08	[0.13, 0.43]	.001
Trait boredom → Excessive buying (A)	-0.04	0.04	[-0.10, 0.04]	.328
Materialism → Boredom (A)	0.14	0.06	[0.03, 0.25]	.016
Trait boredom → Boredom (A)	0.43	0.03	[0.38, 0.48]	.001
Excessive buying (A) → Boredom (A)	-0.05	0.04	[-0.13, 0.04]	.278
Excessive buying (A) × Materialism → Boredom (A)	0.03	0.07	[-0.12, 0.16]	.688
Excessive buying (A) × Trait boredom → Boredom (A)	-0.10	0.34	[-0.17, -0.04]	.002
Materialism ↔ Trait boredom	0.22	0.03	[-0.17, 0.27]	.001
Cross-level interactions				
Excessive buying (D) × Materialism → Boredom (D)	-0.08	0.03	[-0.14, -0.02]	.010
Excessive buying (D) × Trait boredom → Boredom (D)	-0.03	0.03	[-0.05, 0.04]	.264

Note: D: daily level, A: Average level

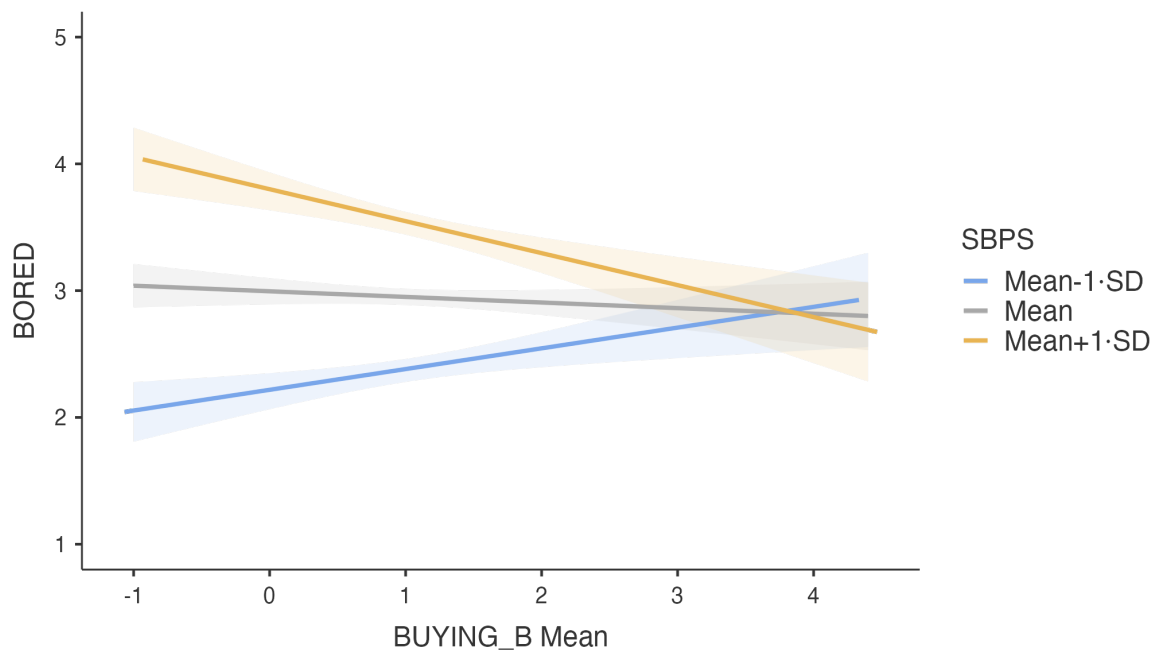
Most importantly, the cross-level interaction between daily excessive buying and materialism in predicting daily boredom remained significant, whereas the interaction between daily excessive buying and trait boredom was not significant. Moreover, the interaction between average excessive buying and materialism predicting average boredom remained nonsignificant, whereas the respective interaction between excessive buying and trait boredom was significant and negative. Further decomposition of this interaction revealed that the link between average excessive buying and average level of boredom was not significant for participants scoring low on trait boredom ($M - 1SD = 2.02$), $b = 0.08$,

Posterior $SD = 0.06$, 95% CI $[-0.02, 0.20]$, $p = .122$, same as for those with average scores on trait boredom ($M = 3.30$), $b = -0.05$, Posterior $SD = 0.04$, 95% CI $[-0.13, 0.04]$, $p = .278$.

However, this link was significant and negative for participants with high boredom proneness ($M + 1SD = 4.56$), $b = -0.18$, Posterior $SD = 0.07$, 95% CI $[-0.31, -0.05]$, $p = .004$ (see Figure 7).

Figure 7

Level of boredom as a function of individual boredom proneness and average excessive buying level. Shaded regions represent 95% CIs



In summary, these additional analyses, controlling for trait boredom proneness, confirmed the robustness of our results. First, the negative association between daily excessive buying and daily boredom remained significant. Second, this link was moderated by the level of materialism.

Cross-country comparison

As an additional robustness check, we examined whether the obtained effects were consistent across the two national samples (Poland vs. the United Kingdom). To this end, we estimated a multilevel Bayesian model that included country as a between-participant predictor and tested its interactions with the key variables (see Table 7).

Table 7

Boredom as a function of excessive buying and participants' materialism. Country as a moderator. Multilevel Structural Equation Model (Study 3).

Effects	<i>b</i>	Posterior <i>SD</i>	95% CI	<i>p</i>
Within Level Effects				
Excessive buying (D) → Boredom (D)	-0.09	0.02	[-0.14, -0.05]	.001
Between Level Effects				
Materialism → Excessive buying (A)	0.25	0.11	[0.04, 0.45]	.020
Country → Excessive buying (A)	-0.63	0.10	[-0.81, -0.42]	.001
Materialism × Country → Excessive buying (A)	0.03	0.14	[-0.25, 0.30]	.850
Excessive buying (A) → Boredom (A)	-0.04	0.06	[-0.15, 0.07]	.450
Materialism → Boredom (A)	0.18	0.09	[-0.01, 0.35]	.066
Country → Boredom (A)	-0.02	0.09	[-0.20, 0.16]	.820
Excessive buying (A) × Materialism → Boredom (A)	-0.03	0.09	[-0.20, 0.14]	.708
Excessive buying (A) × Country → Boredom (A)	0.06	0.10	[-0.14, 0.27]	.562
Materialism × Country → Boredom (A)	0.36	0.15	[0.07, 0.67]	.014
Cross-level interactions				
Excessive buying (D) × Materialism → Boredom (D)	-0.09	0.04	[-0.17, 0.00]	.050
Excessive buying (D) × Country → Boredom (D)	-0.04	0.04	[-0.12, 0.04]	.268
Materialism (D) × Country → Boredom (D)	-0.01	0.06	[-0.13, 0.11]	.924

Note: D: daily level, A: Average level, Country: UK vs. Poland

Overall, the pattern of results closely replicated the findings from the main analysis. At the within-participant level, daily excessive buying remained negatively associated with daily boredom, such that participants reported lower boredom in the evening on days when they engaged in more excessive buying. Importantly, this association did not differ between Poland and the United Kingdom. Similarly, the cross-level interaction between daily excessive buying and materialism predicting daily boredom showed the same direction and pattern as in the main analysis.

At the between-participant level, materialism remained positively related to average excessive buying, whereas the direct association between average excessive buying and average boredom remained non-significant. Likewise, the interaction between average excessive buying and materialism on average boredom was not significant. Overall, the country did not moderate the key relationships tested in the model. The only notable differences concerned mean levels of behavior and one association involving materialism. Specifically, participants from the United Kingdom reported lower average levels of excessive buying than those from Poland. In addition, the relationship between materialism and average boredom was stronger in the UK than in Poland.

Taken together, these results indicate that the central findings of the study are robust across the two cultural contexts, with the main pattern of associations replicating in both national samples.

Day type as potential moderator

As a final robustness check, we examined whether the obtained effects were consistent across the different type of days, that is, the days when participants were busy with working or studying, versus when they had their days off. To this end, we estimated a multilevel Bayesian model that included day type as a within-participant predictor and tested its interactions with the key variables (see Table 8).

Table 8

Boredom as a function of excessive buying and participants' materialism. Type of the day as a moderator. Multilevel Structural Equation Model (Study 3).

Effects	<i>b</i>	Posterior <i>SD</i>	95% CI	<i>p</i>
Within Level Effects				
Excessive buying (D) → Boredom (D)	-0.06	0.02	[-0.10, -0.03]	.004
Day type → Boredom (D)	-0.39	0.05	[-0.48, -0.30]	< .001
Day type → Excessive buying (D)	0.002	0.03	[-0.06, 0.06]	.942
Day type × Excessive buying (D) → Boredom (D)	-0.07	0.02	[-0.14, 0.01]	.062
Between Level Effects				
Materialism → Excessive buying (A)	0.34	0.08	[0.19, 0.50]	< .001
Excessive buying (A) → Boredom (A)	-0.01	0.05	[-0.11, 0.08]	.762
Materialism → Boredom (A)	0.39	0.06	[-0.29, 0.52]	< .001
Excessive buying (A) × Materialism → Boredom (A)	-0.07	0.08	[-0.23, .09]	.400
Cross-level interactions				
Materialism × Excessive buying (D) → Boredom (D)	-0.11	0.02	[-0.14, -0.07]	< .001
Materialism × Day type → Boredom (D)	-0.39	0.05	[-0.48, -0.30]	< .001
Materialism × Day type → Buying (D)	0.001	0.03	[-0.06, 0.06]	.942

Note: D: daily level, A: Average level, Day: working/studying vs. off

Again, the pattern of results closely replicated the findings from the main analysis. At the within-participant level, daily excessive buying remained negatively associated with daily boredom. Importantly, this association was not moderated the day type, as indicated by the nonsignificant interaction between the daily excessive buying, day type, and daily boredom. However, we found a significant main effect of day type on daily boredom, such that participants were less bored on the working/studying days than on their free days.

Concerning cross-level effects, we found a significant interaction between materialism and day type on daily boredom, such that the association between materialism and daily boredom was weaker on working/studying day than on the day off. The interaction

between materialism and the day type on daily excessive buying level was not significant. Importantly, the the cross-level interaction between daily excessive buying and materialism predicting daily boredom showed the same direction and pattern as in the main analysis.

At the between-participant level, materialism remained positively related to average excessive buying and average boredom, whereas the direct association between average excessive buying and average boredom remained non-significant.

Taken together, these results indicate that the central findings of the study are robust across the two types of day, with the main pattern of associations replicating in both contexts.

Study 4a. Novel method of manipulating boredom. Online study.

Prior to the second full-scale experiment in this empirical series, we conducted a pilot study to validate the efficacy of a novel boredom-induction protocol developed by our team in the context of prior research on the behavioral consequences of auction pace and direction: the Clock Task (Kocimska-Bortnowska et al., 2026b). In that project, we demonstrated that slower auction dynamics elicit higher levels of boredom than faster ones, and that these effects extend beyond the focal task, influencing subsequent behaviors (i.e., transfer effects).

The Clock Task belongs to the category of quantity-based monotony manipulations identified in our earlier systematic review and, similarly to the reference transcription task used in Study 2, induces boredom through prolonged engagement in simple, repetitive, and low-stimulation activities. Critically, as an active task, it requires continuous responses, thereby minimizing opportunities for mind-wandering and ensuring sustained engagement throughout the manipulation.

The decision to employ this manipulation in the present research was driven by both theoretical and methodological considerations. First, prior evidence from our methodological work (Kocimska-Bortnowska et al., 2026a) indicates that reference transcription tasks are more effective in controlled laboratory settings than in online environments. Second, in

contemporary online research contexts, the widespread availability of AI-based tools introduces a substantial risk that participants may outsource such tasks (e.g., by uploading images of materials to language models and pasting generated outputs), thereby undermining the validity of the manipulation.

To mitigate these risks, we opted for a boredom-induction procedure specifically designed for and previously validated in online settings. In prior work (Kocimska-Bortnowska et al., 2026b), the Clock Task was shown to reliably induce boredom and to produce downstream behavioral consequences that generalized beyond the immediate task context. However, that research did not examine whether this manipulation also affects perceived meaning, operationalized here as the desire to engage in meaningful activities. Addressing this gap constitutes the primary aim of the present study.

In the present study, we therefore instructed our participants to observe a series of clock stimuli and click each clock when the indicator reached a specified value. We manipulated the temporal dynamics of the clocks across conditions, with 10s in the lower-boredom condition and 30s in the higher-boredom condition. We hypothesized that boredom manipulation would influence the reported feeling of boredom and the desire to engage in meaningful activity, such that: (H1) participants in the higher boredom condition will report higher levels of boredom than those in the lower boredom condition, and (H2) participants in the higher boredom condition will report a higher desire to engage in meaningful activity than those in the lower boredom condition. We preregistered this study's hypotheses, measures, manipulations, analysis, design, and sample size at <https://aspredicted.org/ea83bg.pdf>.

Procedure and participants

We calculated our sample size based on the weakest effect size from the paper by Kocimska-Bortnowska et al. (2026b), which is $\eta^2_p = .048$. A priori power analyses using G*Power (Faul et al., 2007) revealed that given an alpha of .05 and a conventionally assumed

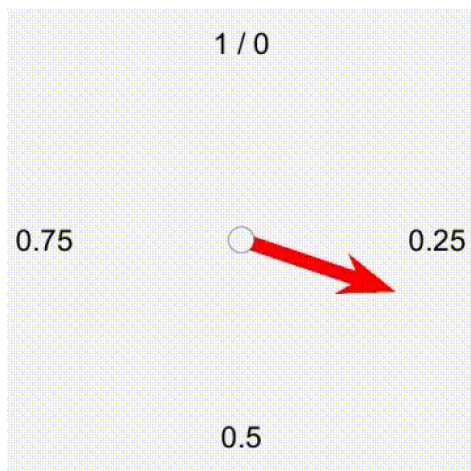
power of .90, a total sample of 212 participants would be required to detect such an effect. Factoring in potential attrition, we planned to recruit a total of 250 participants.

We recruited a total of $N = 250$ US participants via Prolific (122 men, 128 women; age $M = 42.50$, $SD = 13.60$) to participate in a short online study in exchange for £0.50. As preregistered, we excluded participants who clicked the clock before the indicator reached 60 in the boredom manipulation task, as this behavior indicated noncompliance with the experimental instructions. Based on this criterion, we excluded 19 participants from the analysis. The final sample consisted of $N = 231$ participants (117 men, 114 women; age $M = 42.00$, $SD = 13.50$).

After providing informed consent and answering demographic questions, participants were presented with a cover story stating that the study aimed to pilot-test novel measures for future research. Specifically, they were informed that the subsequent task was designed to evaluate the accuracy of numerical estimation on a circular interface rather than a traditional linear scale. On the next page, participants were presented with a circular clock ranging from 0 to 100 (see Figure 8). On each trial, they were instructed to click on the clock when the moving indicator reached a specified value (72, 79, or 87). The order of these target values was randomized across participants. Each participant completed three such trials, with the clock display remaining constant across trials. Manual progression was disabled; the software advanced to the next trial only after the indicator completed a full rotation. Every participant was presented with three such clocks. The key manipulation concerned the pace of the clock: a full rotation of the indicator lasted either 30 sec in the higher boredom condition ($n = 114$) or 10 sec in the lower boredom condition ($n = 117$).

Figure 8

A clock used in Studies 3a and 3b as an experimental manipulation stimulus



In the second part of the study, we asked the participants to answer two short sets of questions (Van Tilburg et al., 2019). The first one concerned the participants' reported level of boredom after completing the manipulation task and consisted of three questions: "How bored do you feel at the moment?," "How boring would you consider the task you completed?," "Did you experience boredom during the task?," with responses on a scale from 1 = not at all to 7 = very much. The second set of questions related to the desire to engage in a meaningful activity and contained four questions: "To what extent would you like to do something more purposeful?," "To what extent would you like to do something of greater significance?," "To what extent would you like to do something that makes more sense?," "To what extent would you like to do something that is more valuable?" with a scale from 1 = not at all to 7 = very much. Both the order of the questionnaires and the questions within the sets were randomized. That concluded the procedure.

Results

Table 9 presents descriptive statistics and zero-order correlation for the variables measured in the study.

Table 9

Descriptive statistics and zero-order correlations between the variables measured in Study

4a

Variable	<i>M</i>	<i>SD</i>	α	1	2
1. State boredom	9.64	5.40	.95	-	
2. State desire to engage in a meaningful activity	21.10	5.28	.95	.45***	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

To verify the first preregistered hypothesis, we conducted an independent samples t-test to compare reported levels of boredom between the lower- and higher-boredom conditions. The effect of the boredom manipulation on the state-level of boredom was significant, $t(227) = -4.52$, $p < .001$, $d = -0.60$. Specifically, participants in the high boredom condition reported significantly higher levels of boredom ($M = 11.20$, $SD = 5.36$) compared to those in the low boredom condition ($M = 8.10$, $SD = 5.01$). These results indicate that the experimental task successfully induced the intended affective state in the high boredom group.

To verify the second preregistered hypothesis, we conducted an independent samples Welch's t-test to compare reported levels of desire to engage in meaningful activity between the lower- and higher-boredom conditions. The analysis revealed a significant difference between groups, $t(204) = -2.34$, $p = .020$, $d = -0.31$, such that participants in the high boredom condition reported significantly higher levels of the desire to engage in meaningful

activity ($M = 21.90$, $SD = 4.23$) than those in the low boredom condition ($M = 20.30$, $SD = 6.06$).

In sum, these results demonstrate that our novel manipulation not only effectively increases boredom but also elevates the desire to engage in meaningful activities. This pattern is consistent with theoretical accounts suggesting that boredom disrupts the sense of meaning, thereby motivating compensatory meaning-seeking (W. A. Van Tilburg & Igou, 2019; Van Tilburg & Igou, 2012). Consequently, the Clock Task manipulation can be considered suitable for use in further studies examining the relationship between boredom, excessive consumption, and materialism.

Study 4b. Buffering Effect of Excessive Buying on Boredom. Online study.

Across the previous studies in this dissertation, we have established a consistent pattern linking boredom, excessive buying, and materialism. In Study 2, we demonstrated that experimentally induced boredom increases the tendency toward excessive buying, with this effect being particularly pronounced among individuals high in materialism. In Study 3, using a diary design, we showed that higher levels of excessive buying on a given day are associated with lower levels of boredom later that same day, again with stronger effects observed among more materialistic individuals. While the diary study provided high ecological validity by capturing these behaviors in a real-life setting, its nature precluded the control of potential confounding variables. Therefore, Study 4b employed a controlled experimental paradigm to confirm the causal role of excessive purchasing behavior as a regulatory mechanism. Specifically, we examined whether engaging in consumption-related activities reduces not only state boredom but also the subsequent drive to engage in meaningful activities.

This study was conducted in a 2 (boredom: higher vs. lower) $\times$ 2 (task: buying vs. non-buying) between-subjects design. As in Study 1, state boredom was induced at the beginning

of the experimental procedure; however, in this study, we employed the novel Clock Task manipulation validated in Study 3a. Participants were then randomly assigned to perform either a consumption-oriented task or a neutral, non-buying task. Consistent with the theoretical framework of this dissertation, we again measured materialism as a potential moderator, testing the claim that the boredom-buffering effects of buying behaviors are contingent upon individual differences in materialistic orientation.

We hypothesized that buying behaviors would attenuate the effects of boredom manipulation on both experienced boredom and the desire to engage in meaningful activities. More precisely, we expected that (H1a) participants in the high boredom condition would report lower levels of boredom after completing a buying-related task than those completing a non-buying-related task, and that (H1b) the difference in levels of boredom for participants in the low boredom condition would be smaller or even non-significant. Second, we predicted that (H2a) participants in the higher boredom condition would report lower levels of desire to engage in meaningful activities after completing a buying-related task than those completing a non-buying-related task, and that (H2b) the difference in levels of desire to engage in meaningful activity for participants in the low boredom condition would be smaller or even non-significant. Finally, we hypothesized that (H3) these buffering effects would be especially pronounced for people high in materialism. We preregistered this study's hypotheses, measures, manipulations, analysis, design, and sample size at <https://aspredicted.org/z5hc4d.pdf>.

Procedure and participants

We again calculated our sample size based on the weakest effect size reported in the paper by Kocimska-Bortnowska et al. (2026b), that is, $\eta^2 = .048$. A priori power analyses using G*Power (Faul et al., 2007) revealed that given an alpha of .05 and a conventionally assumed power of .90, a total sample of 212 participants would be required to detect such a

simple effect. However, because we were interested in the two-way interaction effect between boredom and task type and the three-way interaction between boredom, task type, and materialism, we decided to quadruple the sample size. Factoring for potential attrition, we planned to recruit a total of 900 participants.

We recruited a total of $N = 900$ U.S. participants from Prolific (446 men, 452 women, 2 no gender provided; age $M = 42.40$, $SD = 13.60$) to participate in an online study in exchange for £1.00 remuneration. Consistent with the preregistration and with Study 3a, we excluded participants ($n = 134$) who, during the boredom manipulation task, clicked on the clock before the indicator reached 60. The final sample consisted of $N = 766$ participants (385 men, 379 women, 2 no gender provided; age $M = 42.40$, $SD = 13.80$).

At the beginning of the study, participants provided demographic information and were presented with a cover story stating that the study aimed to pilot procedures and measures for future research. As in Study 4a, they were informed that the first task concerned numerical estimation on a circular interface rather than a traditional linear scale. Participants then completed the Clock Task—a boredom manipulation validated in Study 4a. Briefly, all participants completed three trials involving a clock with values ranging from 0 to 100, with the pace of the indicator manipulated between conditions: 10 seconds in the lower boredom condition ($n = 371$) vs. 30 seconds in the higher boredom condition ($n = 395$ per full rotation). The participants' task was to click on each of the clocks at the exact time when the indicator pointed at a given number (72, 79, or 87, depending on the trial).

The second task constituted the experimental manipulation of excessive buying and differed between the conditions. In the buying condition ($n = 401$), participants were asked to imagine that they were taking part in a lab study in which they would receive five banknotes as compensation. They were instructed that each of the presented items cost one banknote and that they could select up to five items. Participants were shown ten images of small

consumer goods (e.g., a bookmark, stickers, a figurine, a keychain, a toy car; the same goods that we used in Study 1) and asked to choose which items they would purchase by dragging them into a shopping basket. In the non-buying condition ($n = 365$), participants were presented with the same set of ten items but were given a different cover story. They were asked to imagine that they wanted to place some of the items in their pocket, with the constraint that only sufficiently small objects would fit. Their task was to drag the items they deemed fit into a designated pocket area. Thus, both conditions involved comparable stimuli and motor engagement, differing only in the consumption-related versus neutral framing of the task (see the full wording of the instruction and the outline of the experimental task in both conditions in Appendix Figures 1 and 2).

In the final part of the study, participants completed the measure of state boredom (Van Tilburg et al., 2019) and the measure of desire to engage in meaningful activities (Van Tilburg et al., 2019), identical to those used in Study 3a; therefore, the items are not repeated here. Both measures utilized a 7-point Likert-type scale, ranging from 1 (not at all) to 7 (very much). The order of these two dependent measures was randomized, and the items within each scale were presented in random order.

Participants also filled in the 15-item version of the Materialistic Values Scale (MVS; English version: Richins & Dawson, 1992), the same as in Studies 2 and 3, with responses on a scale from 1 = strongly disagree to 5 = strongly agree. The placement of the materialism scale was also randomized: for some participants, it appeared before the experimental tasks, whereas for others it followed the dependent measures. Completion of these measures concluded the experimental procedure.

Results and discussion

Table 10 presents descriptive statistics and zero-order correlations between all the variables measured in the study.

Table 10

Descriptive statistics and zero-order correlations between the variables measured in Study

4b

Variable	<i>M</i>	<i>SD</i>	α	1	2	3
1. State boredom	3.18	1.70	.95	-		
2. State desire for a meaningful activity	5.50	1.18	.93	.19***	-	
3. Trait materialism	42.00	11.30	.89	.02	.16***	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Buffering effects of buying

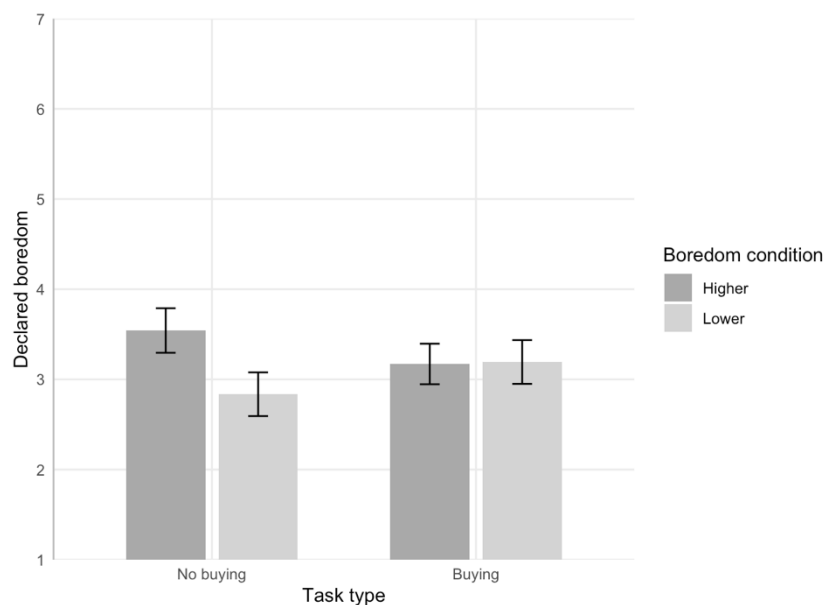
First, we performed a preregistered regression analysis to examine whether the boredom manipulation (higher vs. lower boredom), task type (buying vs. non-buying), and their interaction predicted state boredom scores. The overall model was statistically significant, $F(3, 762) = 5.36, p = .001, R^2 = 2.1\%$. We found a significant main effect of boredom condition, $\beta = .20, SE = .07, 95\% \text{ CI } [.06, .34], t(762) = 2.81, p = .005$, whereas the main effect of task type was nonsignificant, $\beta = -.004, SE = .07, 95\% \text{ CI } [-.15, .14], t(762) = -0.05, p = .958$. Crucially, we found a significant two-way interaction between boredom condition and task type, $\beta = -.43, SE = .14, 95\% \text{ CI } [-.71, -.15], t(762) = -2.98, p = .003$.

To decompose this interaction, we analyzed the effects of boredom manipulation on the state level of boredom within each task condition (see Figure 9). For participants in the non-buying condition, boredom manipulation exerted a significant effect on declared boredom, $\beta = .42, SE = .10, 95\% \text{ CI } [.21, .62], t(762) = 4.01, p < .001$, such that participants

in the higher boredom condition reported significantly higher state boredom compared to those in the lower boredom condition. However, in line with our preregistered hypothesis, this effect was attenuated in the buying condition, $\beta = -.01$, $SE = .10$, 95% CI $[-.21, .18]$, $t(762) = -0.13$, $p = .889$. These results suggest that the presence of a buying task may buffer or neutralize the typical effect of boredom manipulation on declared state boredom observed in non-buying contexts.

Figure 9

Declared state boredom as a function of boredom manipulation and task type



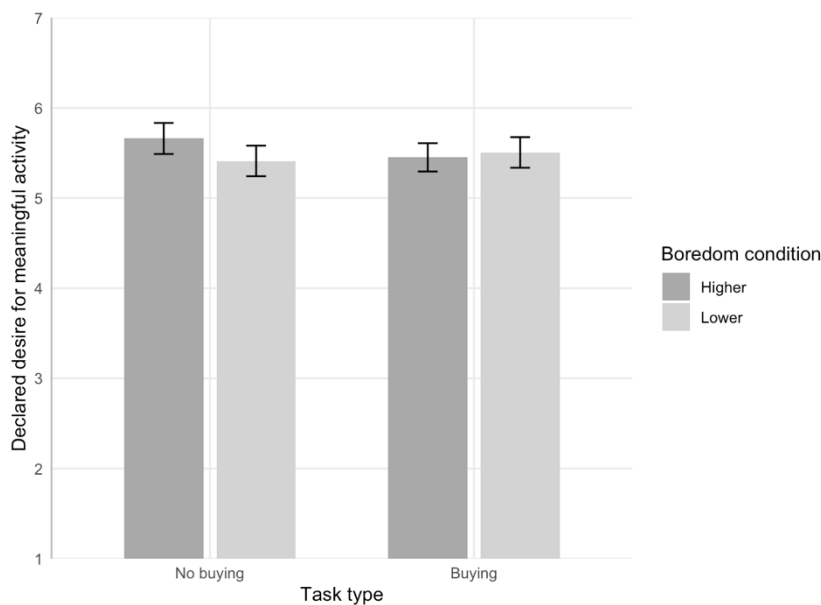
In the second regression analysis, we examined whether boredom condition, task type, and their interaction predicted the desire for meaningful activity. The overall model did not reach statistical significance, $F(3, 762) = 1.59$, $p = .191$, $R^2 = 0.6\%$, suggesting that the predictors collectively accounted for a negligible proportion of the variance in the outcome. Specifically, we found no significant main effects for boredom condition, $\beta = .08$, $SE = .07$, 95% CI $[-.06, .23]$, $t(762) = 1.15$, $p = .252$, or task type, $\beta = -.05$, $SE = .07$, 95% CI $[-.19, .09]$, $t(762) = -0.68$, $p = .499$. Furthermore, the interaction between boredom manipulation

and task type was also non-significant, $\beta = -.26$, $SE = .15$, 95% CI $[-.54, .03]$, $t(762) = -1.78$, $p = .075$, though it trended toward a marginal effect.

Despite the non-significant interaction, we decided to explore the preregistered simple effects to maintain consistency with the primary study objectives (see Figure 10). These analyses revealed that for participants in the no-buying condition, a significant simple effect of boredom manipulation emerged, $\beta = .21$, $SE = .11$, 95% CI $[.01, .42]$, $t(762) = 2.03$, $p = .043$, such that participants in the higher boredom condition reported significantly higher desire for meaningful activity than those in the lower boredom condition. For participants in the buying condition, in line with our hypothesis, boredom manipulation had no impact on the desire for meaningful activity, $\beta = -.05$, $SE = .10$, 95% CI $[-.24, .15]$, $t(762) = -0.46$, $p = .647$. However, given the non-significant model fit and interaction term, these simple effects should be interpreted with caution as exploratory findings.

Figure 10

Desire for meaningful activity as a function of boredom manipulation and task type



Materialism as a moderator of the effects

To examine the boundary conditions of the previously observed effects, we conducted two regression analyses including materialism as a continuous moderator. In the first pre-registered analysis, we evaluated the three-way interaction between boredom condition (higher vs. lower), task type (buying vs. non-buying), and materialism in predicting declared state boredom. The overall model was statistically significant, $F(7, 758) = 3.61$, $p < .001$, $R^2 = .032\%$. The detailed outcomes of this analysis are presented in Table 11.

Table 11

State boredom as a function of boredom condition (higher vs. lower), task type (buying vs. non-buying), and materialism. Regression analysis (Study 4b)

Predictors	β	SE	95% CI	t	p
Boredom condition	.21	.07	[.07, .35]	2.89	.004
Task type	.003	.07	[-.14, .14]	0.04	.971
Materialism	.03	.04	[-.04, .10]	0.79	.431
Boredom condition $\times$ Task type	-.42	.14	[-.70, -.14]	-2.92	.004
Boredom condition $\times$ Materialism	-.04	.07	[-.19, .10]	-0.60	.547
Task type $\times$ Materialism	-.11	.07	[-.25, .03]	-1.53	.126
Boredom condition $\times$ task type $\times$ Materialism	-.34	.15	[-.62, -.05]	-2.32	.021

In this analysis, the main effect of boredom manipulation remained significant. Neither the main effects of task type nor materialism reached a significance threshold. The interaction between the boredom condition and task type remained significant, whereas the other two-way interactions were not significant. Crucially, the analysis yielded a significant three-way interaction, indicating that individual differences in materialism further moderate the interplay between boredom and task type. To decompose this three-way interaction, we

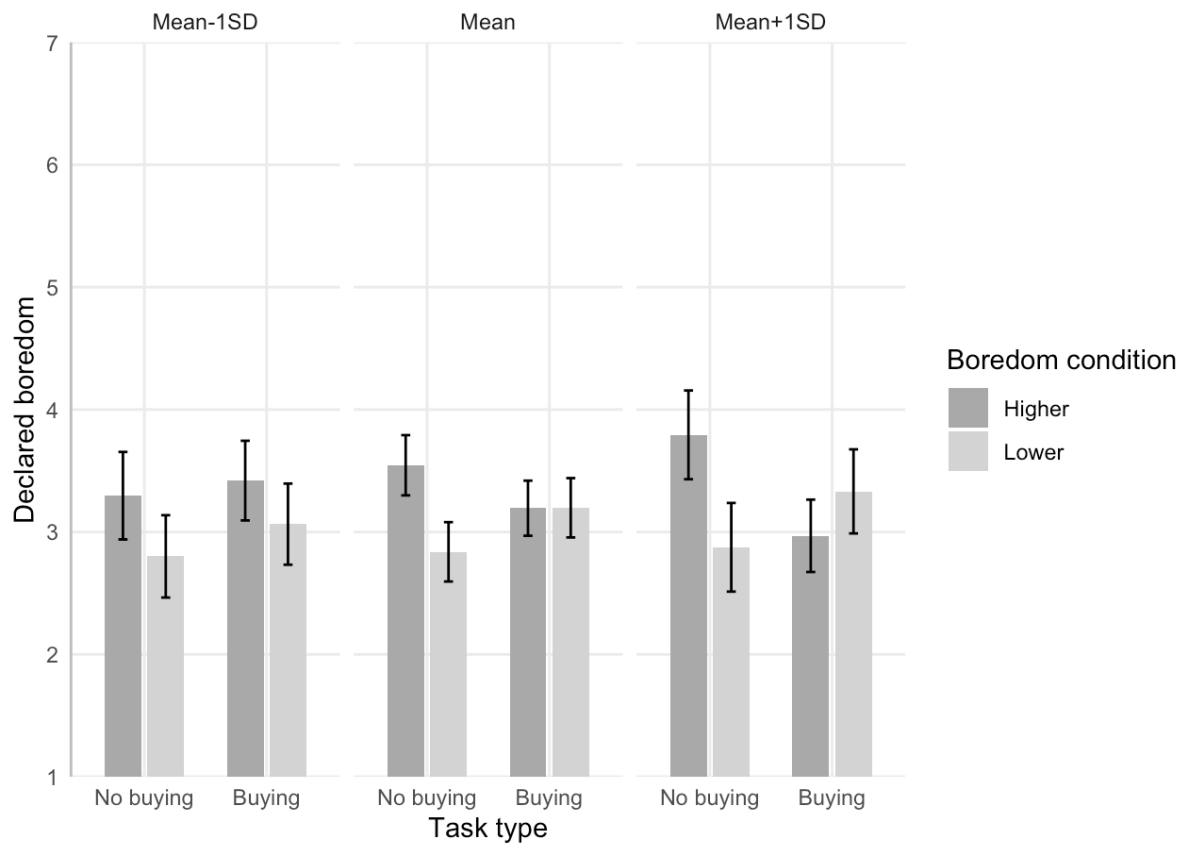
the two-way boredom manipulation $\times$ task type interaction was examined at three levels of materialism.

For participants with low levels of materialism ($M - 1SD = 30.70$), the interaction between boredom manipulation and task type was non-significant, $F(1, 758) = 0.16, p = .686, \eta^2_p < .001$. In contrast, this interaction was significant at mean levels of materialism ($M = 42.00$), $F(1, 758) = 8.50, p = .004, \eta^2_p = .011$, and even more pronounced at high levels of materialism ($M + 1SD = 53.30$), $F(1, 758) = 13.54, p < .001, \eta^2_p = .018$ (See Figure 11). These findings suggest that the buffering effect of a buying task on induced state boredom changes is specifically characteristic of individuals with moderate-to-high materialistic orientations.

Further simple effects analysis (see Appendix Table S1) demonstrated that at low levels of materialism in the no-buying condition, the participants from the higher boredom condition reported significantly higher levels of state boredom than those from the lower boredom condition. The differences in boredom were not present in the buying condition. At mean levels of materialism, the effects of boredom were similar, but stronger. Once again, in the no-buying condition, the participants from the higher boredom condition declared to feel significantly more bored than those in the lower boredom condition. There were no boredom manipulation effects in the buying condition. Simple effects at high levels of materialism revealed the strongest effects of boredom. The pattern resembled the ones at two lower levels of materialism. In the non-buying condition, the participants from the higher boredom condition reported significantly higher levels of state boredom. In line with our hypotheses, there were no significant effects of boredom manipulation in the buying condition.

Figure 11

Decomposition of a three-way interaction between boredom manipulation, task type, and materialism on declared state boredom



In the second analysis, we included materialism as a moderator in the regression analysis predicting state desire for meaningful activity. The overall model was statistically significant, $F(7, 758) = 4.07, p < .001, R^2 = .036\%$. The results of this analysis are presented in Table 12.

Table 12

Regression analysis examining a three-way interaction between boredom condition (higher vs. lower), task type (buying vs. non-buying), and materialism in predicting declared state desire for meaningful activity

Predictors	β	<i>SE</i>	95% CI	<i>t</i>	<i>p</i>
Boredom condition	.06	.07	[-.08, .21]	0.89	.372
Task type	-.06	.07	[-.20, .08]	-0.88	.391
Materialism	.16	.04	[.09, .23]	4.42	.001
Boredom condition $\times$ Task type	-.26	.14	[-.55, .02]	-1.85	.065
Boredom condition $\times$ Materialism	-.12	.07	[-.26, .03]	-1.59	.111
Task type $\times$ Materialism	.03	.07	[-.11, .17]	0.45	.654
Boredom condition $\times$ task type $\times$ Materialism	.12	.15	[-.16, .41]	0.84	.403

As shown in Table 10, the main effects of the boredom manipulation and task type on the desire to engage in meaningful activity were not significant. The effect of materialism was significant and positive, indicating a stronger urge toward purpose among highly materialistic people. None of the three two-way interactions was significant. The three-way interaction was also non-significant, indicating that there are no differences in the interaction between boredom and task type on the desire for meaningful activity across levels of materialism.

These findings indicate that materialism serves as a critical boundary condition, further moderating the established interplay between situational boredom and behavioral engagement. Specifically, the significant three-way interaction for declared state boredom suggests that the capacity of the buying-related activity to alleviate boredom is not universal but contingent on the individual's level of materialistic orientation. Notably, this moderating effect of materialism was exclusive to the experience of state boredom, as it did not emerge

in relation to the desire to engage in meaningful activity. Consequently, these results provide a foundational framework for understanding the unique psychological challenges and regulatory struggles that materialistic individuals encounter when experiencing boredom.

Discussion

In the current project, we investigated whether the excessive buying behaviors can serve a compensatory mechanism for boredom regulation. Specifically, we examined the proposition that individuals engage in excessive buying behaviors as a strategic, albeit potentially dysfunctional, response to mitigate the aversive state of boredom and re-establish a sense of personal meaning that has been rendered fragile or diminished by the state of boredom (Van Tilburg et al., 2013; Van Tilburg & Igou, 2011, 2012). To this end, we conducted four studies that employed various methodological frameworks and research measures, including systematic review, diary study, and both laboratory and online experiments, which allowed us to capture the complex nature of this boredom compensatory mechanism.

Study 1 provided a systematic map of the experimental paradigms currently used to induce boredom, identifying five distinct methodological families and highlighting the critical distinction between passive and active inductions. This review revealed that quantity-based monotony tasks—particularly those conducted in laboratory settings—offer the best combination of internal validity and boredom specificity, and informed the design of all subsequent studies. Study 2 demonstrated, in a controlled laboratory experiment, that induced boredom causally increases the tendency to engage in excessive buying, and that this effect is moderated by materialism: the relationship between boredom and buying was stronger among individuals who hold materialistic values, and did not appear among those who do not.

Study 3 was a two-week-long daily diary study with a diverse sample from Poland and the UK. We found that higher levels of daily excessive shopping (as measured by time

spent, money spent, and items purchased) predicted lower levels of daily state boredom in the evening, and that this effect was more pronounced for individuals who place a higher value on material possessions.

Preregistered experimental Study 4a served as a pilot study to validate a novel boredom-induction protocol, the Clock Task, specifically designed for online research environments. We demonstrated that a slower clock elicits higher levels of both state boredom and a desire to engage in meaningful activities, with the former effect being stronger than the latter. This pilot work provided the necessary empirical evidence to adopt the Clock Task as a robust alternative to laboratory-based transcription tasks, ensuring high internal validity for a large-scale online experiment in Study 4b. Study 4b served as the final experimental confirmation of the "boredom-buffering" hypothesis, utilizing a controlled online environment to establish a definitive causal link. While the previous diary study provided high ecological validity, in Study 4b, we aimed to isolate the regulatory function of consumption by controlling for confounding variables that occur in real-life settings. Using a 2×2 between-subjects experimental design, we manipulated both the level of boredom (using the Clock Task validated in Study 4a) and the type of subsequent activity (buying-related vs. neutral), and measured state boredom and the desire to engage in meaningful activity as dependent variables. We found that the buying-related task hindered boredom, especially in individuals high in trait materialism. However, we did not find such an effect for the desire to engage in meaningful activity. These findings suggest that for materialistic individuals, shopping may serve as a psychological "buffer" that temporarily resolves the aversive state of boredom but does not restore the sense of meaning hindered by boredom.

Theoretical contribution

Together, the studies included in this project make several theoretical contributions. First, they extend the psychological literature on boredom by identifying excessive

consumption as a readily available behavioral response to this aversive state. Although boredom has been linked to impulsive and sensation-seeking behaviors more broadly (Bench & Lench, 2013; Moynihan et al., 2017), and correlational evidence has demonstrated the relationship between boredom proneness and impulsive buying tendencies (Gasiorowska, 2011), the causal direction of this relationship—and its applicability to excessive, non-necessary buying in particular—had not previously been established. Although the notion that individuals frequently engage in digital browsing or unplanned purchasing when bored is a hallmark of lay belief, the psychological literature lacked a rigorous exploration of this phenomenon prior to the current project. Our laboratory experiment provides direct causal evidence that experimentally induced boredom increases actual purchasing behavior, operationalized via real purchase of non-necessary goods.

This finding is consistent with multiple theoretical accounts of boredom. From a functional and self-regulatory perspective (Bench & Lench, 2013), boredom signals a deficit in goal engagement and motivates approach behaviors that promise to restore stimulation and meaning. In modern consumer environments, shopping is both cognitively engaging and hedonic, making it a particularly available response to this signal. From a meaning-based perspective (Van Tilburg & Igou, 2011, 2012), boredom threatens the sense that one's current activities are purposeful, and materialistic individuals may be especially inclined to seek restoration of meaning through acquisition—an activity they have internalized as central to success and happiness (Richins, 2017; Richins & Dawson, 1992). The attentional account (Eastwood et al., 2012; Tam, Van Tilburg, Chan, et al., 2021) further suggests that boredom arises when attentional resources cannot be satisfactorily engaged; the volitional, decision-laden nature of shopping may provide precisely the attentional engagement needed to exit the boredom state. Our findings thus speak simultaneously to functional, meaning-based, and

attentional theories of boredom, converging on the conclusion that consumption constitutes a psychologically coherent response to boredom across multiple mechanisms.

Second, the present research advances understanding of boredom regulation by examining not only whether boredom promotes consumption but also whether consumption can alleviate boredom. Prior research on boredom regulation has focused predominantly on strategies such as social interaction, leisure, and cognitive reappraisal (Bench & Lench, 2013; Van Tilburg & Igou, 2017a), leaving the regulatory potential of consumption largely uncharted. By investigating both the antecedents and consequences of buying behavior, our work provides a more comprehensive account of the role of consumption in boredom regulation. While the results from Study 2 indicate that heightened boredom prompts individuals to seek escape through excessive, unplanned purchases, the diary data findings (Study 3) and the experimental evidence (Study 4b) converge in showing that buying behavior is indeed associated with reduced boredom, consistent with its role as a motivated coping strategy. This bidirectionality has important theoretical implications. It suggests that boredom and buying do not merely co-occur but are linked through a functional loop: boredom motivates buying as a means of escape, and buying partially fulfills this regulatory function by providing stimulation, attentional engagement, and perhaps a transient sense of purpose. Such a loop could help explain why excessive buying sometimes escalates over time: each episode of buying offers temporary relief, thereby reinforcing the behavior but leaving the underlying regulatory need unresolved, creating conditions for renewed boredom and renewed buying. This interpretation is consistent with theoretical models of repetitive and compulsive consumption, in which short-term relief perpetuates long-term cycles of need and acquisition (Dittmar, 2005; Dittmar et al., 2014). The neurobiological underpinnings of this regulatory loop may be traced to dopamine-based models of boredom. The dopamine-initiated mechanism of boredom (McAllister & Nichols, 2018) characterizes the state as a

byproduct of neurochemical depletion that impairs cognitive and affective functioning. Given that the literature consistently identifies compulsive shopping as a potent trigger for dopamine release (Hartston, 2012; Moore et al., 2014; Wyatt, 2025), excessive buying behaviors may represent an endogenous attempt to stimulate the reward system, thereby counteracting the low-arousal state inherent to boredom. This neurochemical account is consistent with the stimulation and attentional engagement that buying provides, and offers a mechanistic explanation for the partial regulatory efficacy of consumption observed across the present studies.

A central contribution of the present research is the identification of materialism as a key moderator of both the boredom-to-buying and the buying-to-boredom pathways. Across studies, the tendency for boredom to elicit buying was significantly stronger among individuals high in materialistic values, and the regulatory (boredom-reducing) efficacy of buying was similarly amplified among such individuals. These findings contribute to the literature on consumer values by demonstrating that materialistic beliefs shape not merely how frequently individuals buy, but also the psychological function that buying serves for them. Notably, this pattern of moderation bears on a theoretically important distinction between two possible mechanisms linking boredom to excessive buying: an arousal-based pathway, in which buying counteracts the low stimulation characteristic of boredom through dopamine-mediated reward, and a meaning-based pathway, in which buying alleviates boredom by conferring a sense of purpose and direction. If the effect were driven primarily by the arousal mechanism, it should be relatively independent of materialism, since the neurochemical consequences of purchasing do not selectively favor individuals who hold materialistic values. The consistent moderation by materialism observed across studies instead supports the meaning-based account: it is the symbolic and existential significance that materialistic individuals attach to acquisition that amplifies consumption as a boredom

regulation strategy. For individuals who endorse the view that acquisition is central to success and happiness (Richins, 2017; Richins & Dawson, 1992), buying apparently offers a meaningful and experientially satisfying response to aversive states—or at least is perceived as likely to do so, motivating engagement. Consequently, for these individuals, consumption may be framed as a pursuit of meaning; they often imbue shopping and material acquisition with significance, purpose, and direction (Jackson & Pepper, 2010). For individuals low in materialism, by contrast, buying appears to carry less psychological valence as a coping strategy, and boredom may be more readily channeled into alternative behaviors. This finding is consistent with the broader perspective that coping responses are shaped not only by the emotion experienced but also by individuals' chronic value orientations and their learned associations between activities and their instrumental or hedonic outcomes (Van Tilburg & Igou, 2017a).

Importantly, however, the regulatory function of buying appears to be both partial and potentially self-undermining. Previous research has consistently shown that materialistic values are negatively associated with well-being and life satisfaction (Dittmar et al., 2014; Kasser, 2002; Kasser et al., 2004). This suggests that even if buying provides temporary relief from boredom, it does not address the deeper psychological needs—for meaning, autonomy, and genuine engagement—that boredom signals. Indeed, highly materialistic individuals reported higher average levels of boredom in Study 3, consistent with the possibility that materialistic goal pursuits systematically fail to provide lasting fulfillment (Kasser, 2002), rendering such individuals both more vulnerable to boredom and more dependent on consumption as a short-term palliative. This pattern resonates with the concept of a hedonic treadmill (Brickman & Campbell, 1971; Gasiiorowska, 2015) applied to consumption: each buying episode temporarily reduces boredom, but higher baseline levels of boredom among materialistic individuals ensures that the regulatory cycle continues. The present findings thus

carry a somewhat ironic implication: the individuals who most strongly use buying to regulate boredom may be the very individuals for whom this strategy is least effective in the long run. This process might explain why individuals in materialistic societies often remain in a perpetual struggle for happiness through the acquisition of novel goods, failing to recognize that such efforts are fundamentally maladaptive for achieving longitudinal well-being (Diener et al., 2006).

Beyond its substantive findings, the present research makes a contribution to the experimental study of boredom by providing a systematic evaluation of available induction paradigms (Study 1) and by validating a novel Clock Task manipulation suitable for online settings (Study 4a). As boredom research moves increasingly toward online experimentation, the methodological challenge of inducing boredom without affording participants ready means of attentional escape becomes particularly acute. The Clock Task addresses this challenge by maintaining participant engagement within a constrained and repetitive activity, while minimizing opportunities for uncontrolled disengagement. Its validation in Study 4a, where it not only increased boredom but also elevated desire for meaningful activity, confirms that it captures theoretically relevant features of the boredom state rather than inducing generalized negative affect. The multi-method approach combining a laboratory experiment, a two-week diary study, and two online experiments further strengthens the overall evidence base by providing converging support for the boredom–buying relationship across ecologically distinct contexts, populations (Polish and UK samples), and operationalizations of both boredom and buying.

Limitations and Further Research

Several limitations across the constituent studies of this project warrant consideration. While we employed a mixed-method strategy to bolster both ecological and internal validity, each methodological approach entails inherent trade-offs.

Regarding the experimental laboratory design of Study 2, a behavioral measure of excessive buying was administered in a simulated retail environment, where participants used play currency to purchase assorted small gifts and toys. Although this variable was constructed to approximate a naturalistic buying scenario, it remains a proxy for real-world consumption. Authentic in-store shopping is characterized by a complex constellation of confounding variables—including social presence, expansive product assortments, sensory stimuli, and ubiquitous advertising—that are difficult to fully replicate in a controlled laboratory setting. Consequently, the artificial nature of the lab environment may not fully capture the multifaceted environmental factors that influence consumption in shopping malls or on shopping platforms. Future research should seek to replicate these effects using consequential purchasing decisions in field settings.

Second, although the daily diary design of Study 3 captures naturalistic variation in buying and boredom, it precludes definitive causal inference about the within-day ordering of effects. Whether boredom experienced earlier in the day predicts buying behavior later, and whether that buying in turn accounts for the lower boredom reported in the evening, remains to be established in future experience-sampling studies using temporally separated within-day assessments. More broadly, the present research does not speak to the durability of the regulatory effect of buying. In Study 3, the boredom-reducing effect of excessive buying was observed exclusively at the within-person, daily level, while the between-subjects association was non-significant—a pattern consistent with the interpretation that the regulatory impact of buying on boredom is transient rather than lasting. This interpretation is further supported by the finding in Study 4b that while buying attenuated the immediate subjective experience of boredom, it exerted no influence on the underlying desire to engage in meaningful activities. Collectively, these findings suggest that the long-term consequences of using excessive buying as a boredom-regulation strategy are, on balance, negative—offering momentary

relief while leaving the deeper psychological deficits that boredom signals unaddressed.

Future research should examine the temporal dynamics of this regulatory cycle over longer intervals to assess whether, and at what timescale, its costs outweigh its benefits.

Third, the samples employed in the experimental Study 2 consisted predominantly of younger, educated adults, whereas participants in the Studies 3, 4a, and 4b were recruited through Prolific, which may constrain generalizability to populations with different consumption habits, financial resources, or relationships to materialistic values. Moreover, the behavioral metrics integrated into the online framework in Study 4b were necessarily artificial. By prompting participants to imagine a scenario in which they selected products for purchase based on visual stimuli, we attempted to replicate the simulated environment utilized in Study 2. Ultimately, these measures remained purely declarative and hypothetical, lacking the consequentiality of actual behavioral engagement.

Fourth, while materialism emerged as a consistent and theoretically coherent moderator, the present research did not assess other individual difference variables that may further qualify the boredom–buying relationship, including boredom proneness, impulsivity, regulatory focus, or compulsive buying tendencies. Examining these variables alongside materialism could provide a more comprehensive account of individual vulnerability to consumption-based boredom regulation.

Finally, the studies were conducted exclusively within Western cultural contexts—Poland and the United Kingdom—and the generalizability of the findings to non-Western populations remains an open empirical question. Research suggests that the subjective experience of boredom is not culturally invariant but may be modulated by internalized values and culturally prescribed affective ideals (Ng et al., 2015). The concept of ideal affect is particularly relevant here: cultures differ systematically in the affective states they valorize, with many Western cultures prioritizing high-arousal positive states—excitement,

stimulation, enthusiasm—as normative life goals (Tsai et al., 2006). Because boredom arises partly from a mismatch between available stimulation and an individual's requisite arousal level (Eastwood et al., 2012), cultures that place less premium on high arousal may produce weaker or differently structured boredom experiences. Accordingly, the palliative function of consumption observed in the present Western samples—where buying provides a readily available source of stimulation and momentary meaning—may be attenuated or structurally different in Eastern cultural contexts where lower-arousal states are more highly valued. Cross-cultural replication is therefore a priority for future work.

Conclusions

Boredom is among the most common and least pleasant of everyday affective experiences, and people are continually motivated to do something about it. The present research demonstrates that for a substantial portion of the population—particularly those who place a high value on material acquisition—buying is one of those things: a readily available, psychologically meaningful, and at least partially effective strategy for escaping the disengagement, meaninglessness, and under-stimulation that characterize the bored mind. Yet the evidence also points to a troubling asymmetry: while buying reliably reduces boredom in the short term, materialistic individuals—those most inclined to buy when bored—report chronically higher levels of boredom overall, suggesting that consumption-based coping perpetuates the very state it is recruited to resolve. In this sense, the present findings illuminate a self-sustaining psychological mechanism at the intersection of boredom and materialism, with implications for understanding both the psychology of consumer behavior and the broader question of how people navigate aversive states when exposed to abundant, easily accessible consumption opportunities.

References

- Allen, D. A. (1980). Filling time versus affective response to the activity that fills the time: Independent effects on time judgment? *Perceptual and Motor Skills*, 51, 723–727. Scopus. <https://doi.org/10.2466/pms.1980.51.3.723>
- Bailey, J. P., Thackray, R. I., Pearl, J., & Parish, T. S. (1976). Boredom and arousal: Comparison of tasks differing in visual complexity. *Perceptual and Motor Skills*, 43(1), 141–142. <https://doi.org/10.2466/pms.1976.43.1.141>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147. <https://doi.org/10.1037/0003-066X.37.2.122>
- Barbalet, J. M. (1999). Boredom and social meaning. *The British Journal of Sociology*, 50(4), 631–646. <https://doi.org/10.1111/j.1468-4446.1999.00631.x>
- Barmack, J. E. (1939). Studies on the psychophysiology of boredom: Part I. The effect of 15 mgs. of benzedrine sulfate and 60 mgs. of ephedrine hydrochloride on blood pressure, report of boredom and other factors. *Journal of Experimental Psychology*, 25(5), 494–505. Scopus. <https://doi.org/10.1037/h0054402>
- Bartels, D. M., & Urminsky, O. (2011). On intertemporal selfishness: How the perceived instability of identity underlies impatient consumption. *Journal of Consumer Research*, 38(1), 182–198. <https://doi.org/10.1086/658339>
- Belinda, C., Melwani, S., & Kapadia, C. (2024). Breaking boredom: Interrupting the residual effect of state boredom on future productivity. *Journal of Applied Psychology*, 109(6), 829–849. <https://doi.org/10.1037/apl0001161>
- Belk, R. W. (1985). Materialism: Trait aspects of living in the material world. *Journal of Consumer Research*, 12(3), 265–280. <https://doi.org/10.1086/208515>
- Belk, R. W. (1988). Possessions and the Extended Self. *Journal of Consumer Research*, 15(2), 139–168. <https://doi.org/10.1086/209154>

- Bench, S. W., & Lench, H. C. (2013). On the function of boredom. *Behavioral Sciences*, 3(3), Article 3. <https://doi.org/10.3390/bs3030459>
- 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>
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. McGraw-Hill Book Company. <https://doi.org/10.1037/11164-000>
- Bieleke, M., Barton, L., & Wolff, W. (2021). Trajectories of boredom in self-control demanding tasks. *Cognition and Emotion*, 35(5), 1018–1028. <https://doi.org/10.1080/02699931.2021.1901656>
- Bowman, N. D., & Tamborini, R. (2015). “In the Mood to Game”: Selective exposure and mood management processes in computer game play. *New Media and Society*, 17(3), 375–393. <https://doi.org/10.1177/1461444813504274>
- Boyle, G. J., Richards, L. M., & Baglioni, A. J. (1993). Children’s motivation analysis test (CMAT): An experimental manipulation of curiosity and boredom. *Personality and Individual Differences*, 15(6), 637–643. [https://doi.org/10.1016/0191-8869\(93\)90005-N](https://doi.org/10.1016/0191-8869(93)90005-N)
- Bozaci, I. (2020). The effect of boredom proneness on smartphone addiction and impulse purchasing: A field study with young consumers in Turkey. *The Journal of Asian Finance, Economics and Business*, 7(7), 509–517. <https://doi.org/10.13106/jafeb.2020.vol7.no7.509>
- Brickman, P., & Campbell, D. T. (1971). Hedonic relativism and planning the good society. *Adaptation Level Theory*, 287–301.

- Ceron, E. (2021). 6 easy ways to stop shopping when you're bored (and save a ton of money in the process). *Apartment Therapy*. <https://www.apartmenttherapy.com/how-to-stop-shopping-when-youre-bored-36920709>
- Chan, C. S., Van Tilburg, W. A. P., Igou, E. R., Poon, C. Y. S., Tam, K. Y. Y., Wong, V. U. T., & Cheung, S. K. (2018). Situational meaninglessness and state boredom: Cross-sectional and experience-sampling findings. *Motivation and Emotion*, 42(4), 555–565. <https://doi.org/10.1007/s11031-018-9693-3>
- Chang, H.-J., Eckman, M., & Yan, R.-N. (2011). Application of the Stimulus-Organism-Response model to the retail environment: The role of hedonic motivation in impulse buying behavior. *The International Review of Retail, Distribution and Consumer Research*, 21(3), 233–249. <https://doi.org/10.1080/09593969.2011.578798>
- Chao, T., Todman, M., Foltin, R. W., Evans, S. M., & Bedi, G. (2024). Laboratory method to induce state boredom increases impulsive choice in people who use cocaine and controls. *American Journal of Drug and Alcohol Abuse*, 50(1), 42–53. <https://doi.org/10.1080/00952990.2023.2248544>
- Chapman, C. D., Nilsson, V. C., Thune, H. Å., Cedernaes, J., Le Grevès, M., Hogenkamp, P. S., Benedict, C., & Schiöth, H. B. (2014). Watching TV and food intake: The role of content. *PLOS ONE*, 9(7). <https://doi.org/10.1371/journal.pone.0100602>
- Cheema, A., Chakravarti, D., & Sinha, A. R. (2012). Bidding behavior in descending and ascending auctions. *Marketing Science*, 31(5), 779–800. <https://doi.org/10.1287/mksc.1120.0730>
- Chin, A., Markey, A., Bhargava, S., Kassam, K. S., & Loewenstein, G. (2017). Bored in the USA: Experience sampling and boredom in everyday life. *Emotion*, 17(2), 359–368. <https://doi.org/10.1037/emo0000232>

- Colier, N. (2012, August 8). Boredom: The disease of our time. *Psychology Today*.
<https://www.psychologytoday.com/ca/blog/inviting-monkey-tea/201208/boredom-the-disease-our-time>
- Coughlan, G., Igou, E. R., Van Tilburg, W. A. P., Kinsella, E. L., & Ritchie, T. D. (2019). On boredom and perceptions of heroes: A meaning-regulation approach to heroism. *Journal of Humanistic Psychology, 59*(4), 455–473.
<https://doi.org/10.1177/0022167817705281>
- Danckert, J., & Allman, A.-A. A. (2005). Time flies when you're having fun: Temporal estimation and the experience of boredom. *Brain and Cognition, 59*(3), 236–245.
<https://doi.org/10.1016/j.bandc.2005.07.002>
- Danckert, J., & Elpidorou, A. (2023). In search of boredom: Beyond a functional account. *Trends in Cognitive Sciences, 27*(5), 494–507.
<https://doi.org/10.1016/j.tics.2023.02.002>
- Danckert, J., Hammerschmidt, T., Marty-Dugas, J., & Smilek, D. (2018). Boredom: Under-aroused and restless. *Consciousness and Cognition, 61*, 24–37.
<https://doi.org/10.1016/j.concog.2018.03.014>
- Danckert, J., & Merrifield, C. (2018). Boredom, sustained attention and the default mode network. *Experimental Brain Research, 236*(9), 2507–2518.
<https://doi.org/10.1007/s00221-016-4617-5>
- Daschmann, E. C., Goetz, T., & Stupnisky, R. H. (2011). Testing the predictors of boredom at school: Development and validation of the precursors to boredom scales. *British Journal of Educational Psychology, 81*(3), 421–440.
<https://doi.org/10.1348/000709910X526038>

- Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist*, 61(4), 305–314.
<https://doi.org/10.1037/0003-066X.61.4.305>
- Dittmar, H. (2005). A new look at “Compulsive Buying”: Self-discrepancies and materialistic values as predictors of compulsive buying tendency. *Journal of Social and Clinical Psychology*, 24(6), 832–859. <https://doi.org/10.1521/jscp.2005.24.6.832>
- Dittmar, H., Bond, R., Hurst, M., & Kasser, T. (2014). The relationship between materialism and personal well-being: A meta-analysis. *Journal of Personality and Social Psychology*, 107(5), Article 5. <https://doi.org/10.1037/a0037409>
- Dittmar, H., & Drury, J. (2000). Self-image – is it in the bag? A qualitative comparison between “ordinary” and “excessive” consumers. *Journal of Economic Psychology*, 21(2), Article 2. [https://doi.org/10.1016/S0167-4870\(99\)00039-2](https://doi.org/10.1016/S0167-4870(99)00039-2)
- Drody, A. C., Ralph, B. C. W., Danckert, J., & Smilek, D. (2022). Boredom and media multitasking. *Frontiers in Psychology*, 13, 807667.
<https://doi.org/10.3389/fpsyg.2022.807667>
- Eastwood, J. D., Frischen, A., Fenske, M. J., & Smilek, D. (2012). The unengaged mind: Defining toredom in Terms of attention. *Perspectives on Psychological Science*, 7(5), 482–495. <https://doi.org/10.1177/1745691612456044>
- Elliott, R. (1994). Addictive consumption: Function and fragmentation in postmodernity. *Journal of Consumer Policy*, 17(2), 159–179. <https://doi.org/10.1007/BF01016361>
- Elpidorou, A. (2021). Is boredom one or many? A functional solution to the problem of heterogeneity. *Mind & Language*, 36(3), 491–511. <https://doi.org/10.1111/mila.12282>
- Elpidorou, A. (2023). Boredom and cognitive engagement: A functional theory of boredom. *Review of Philosophy and Psychology*, 14(3), 959–988.
<https://doi.org/10.1007/s13164-021-00599-6>

- Faber, R. J., & O'Guinn, T. C. (1992). A clinical screener for compulsive buying. *Journal of Consumer Research*, 19(3), 459–469. <https://doi.org/10.1086/209315>
- Fahlman, S. A., Kimberley, M. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009). Does a lack of meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology*, 28(3), 307–340. <https://doi.org/10.1521/jscp.2009.28.3.307>
- Fahlman, S. A., Mercer-Lynn, K. B., Flora, D. B., & Eastwood, J. D. (2013). Development and validation of the Multidimensional State Boredom Scale. 2013, 20(1), 68–85. <https://doi.org/10.1177/1073191111421303>
- Farmer, R., & Sundberg, N. (1986). Boredom proneness—The development and correlates of a new scale. *Journal of Personality Assessment*, 50, 4–17. https://doi.org/10.1207/s15327752jpa5001_2
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Fenichel, O. (1951). On the psychology of boredom. In *Organization and pathology of thought: Selected sources* (pp. 349–361). Columbia University Press. <https://doi.org/10.1037/10584-018>
- Finkielsztein, M. (2022). Consumer boredom: Boredom as a subliminal mood of consumer capitalism. *European Journal of American Studies*, 17(4). <https://doi.org/10.4000/ejas.18977>
- Finkielsztein, M. (2024). The essence of boredom: The definition of situational boredom. *Journal of Boredom Studies*, (2), Article 2.
- Folwarczny, M., Gasiorowska, A., Sigurdsson, V., & Otterbring, T. (2024). Conspicuous consumption and conscientious conservation: Testing for a status-prosociality link

- through need for uniqueness and variety seeking. *Cleaner and Responsible Consumption*, 14, 100219. <https://doi.org/10.1016/j.clrc.2024.100219>
- Gasiorowska, A. (2001). Kupowanie kompulsywne–zjawisko, jego determinanty i konsekwencje: Przegląd badań. *Przegląd Psychologiczny*, 44(4), 463–477.
- Gasiorowska, A. (2011). Gender as a moderator of temperamental causes of impulse buying tendency. *Journal of Customer Behaviour*, 10(2), 119–142. <https://doi.org/10.1362/147539211X589546>
- Gasiorowska, A. (2013). Różnice indywidualne w skłonności do kupowania impulsywnego. Konstrukcja i walidacja skali pomiarowej. *Psychologia Ekonomiczna - Wydawnictwo Archiwalne*, (4), Article 4. <https://doi.org/10.14659/PJOEP.2013.04.01>
- Gasiorowska, A. (2015). Hedonic treadmill. *Real-World Decision Making: An Encyclopedia of Behavioral Economics*, 27, 196–197.
- Goetz, T., Bieleke, M., Yanagida, T., Krannich, M., Roos, A.-L., Frenzel, A. C., Lipnevich, A. A., & Pekrun, R. (2023). Test boredom: Exploring a neglected emotion. *Journal of Educational Psychology*, 115(7), 911–931. <https://doi.org/10.1037/edu0000807>
- Goldberg, R., & Todman, M. (2018). Induced boredom suppresses the recall of positively valenced information: A preliminary study. *Psychological Thought*, 11(1), 18–32. Scopus. <https://doi.org/10.5964/psyc.v11i1.249>
- Gorelik, D., & Eastwood, J. D. (2024). Trait boredom as a lack of agency: A theoretical model and a new assessment tool. *Assessment*, 31(2), 321–334. <https://doi.org/10.1177/10731911231161780>
- Górnik-Durose, M. (2016). Polska adaptacja skali wartości materialnych (MVS) – właściwości psychometryczne wersji pełnej i wersji skróconych. *Psychologia Ekonomiczna*, (9), 5–21. <https://doi.org/10.15678/PJOEP.2016.09.01>

- Greenson, R. R. (1953). On boredom. *Journal of the American Psychoanalytic Association*, 1(1), Article 1. <https://doi.org/10.1177/000306515300100102>
- Groeppel-Klein, A. (2005). Arousal and consumer in-store behavior. *Brain Research Bulletin, 2nd Conference on NeuroEconomics - ConNEcs 2004*, 67(5), 428–437. <https://doi.org/10.1016/j.brainresbull.2005.06.012>
- Gu, Z., He, Y., Liu, L., Liang, Y., Huang, L., Dang, J., Wei, C., Liu, Z., & Su, Q. (2021). How does narcissism influence corruption? The moderating role of boredom. *Personality and Individual Differences*, 183. <https://doi.org/10.1016/j.paid.2021.111149>
- Harris, M. B. (2000). Correlates and characteristics of boredom proneness and boredom. *Journal of Applied Social Psychology*, 30(3), 576–598. <https://doi.org/10.1111/j.1559-1816.2000.tb02497.x>
- Havermans, R. C., Vancleef, L., Kalamatianos, A., & Nederkoorn, C. (2015). Eating and inflicting pain out of boredom. *Appetite*, 85, 52–57. <https://doi.org/10.1016/j.appet.2014.11.007>
- Hebb, D. O. (1955). Drives and the C. N. S. (conceptual nervous system). *Psychological Review*, 62(4), Article 4. <https://doi.org/10.1037/h0041823>
- Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The Meaning Maintenance Model: On the coherence of social motivations. *Personality and Social Psychology Review*, 10(2), 88–110. https://doi.org/10.1207/s15327957pspr1002_1
- Hong, J., Im, I., & Park, S. (2024). It's all about timing: Captive targeting through mobile ads. *Journal of Advertising*, 53(2), 242–261. Scopus. <https://doi.org/10.1080/00913367.2023.2212010>
- Horne, A. (2020, November 8). The plague of boredom. *Medium*. <https://qfdeehgr.medium.com/the-plague-of-boredom-809e99086f99>

- Horrey, W. J., Lesch, M. F., Garabet, A., Simmons, L., & Maikala, R. (2017). Distraction and task engagement: How interesting and boring information impact driving performance and subjective and physiological responses. *Applied Ergonomics*, 58, 342–348. <https://doi.org/10.1016/j.apergo.2016.07.011>
- Hunter, A., & Eastwood, J. D. (2018). Does state boredom cause failures of attention? Examining the relations between trait boredom, state boredom, and sustained attention. *Experimental Brain Research*, 236(9), 2483–2492. <https://doi.org/10.1007/s00221-016-4749-7>
- Hunter, J. A., Dyer, K. J., Cribbie, R. A., & Eastwood, J. D. (2016). Exploring the utility of the Multidimensional State Boredom Scale. *European Journal of Psychological Assessment*, 32(3), 241–250. <https://doi.org/10.1027/1015-5759/a000251>
- Hunter, J. A., & Eastwood, J. D. (2021). Understanding the relation between boredom and academic performance in postsecondary students. *Journal of Educational Psychology*, 113(3), 499–515. <https://doi.org/10.1037/edu0000479>
- Iso-Ahola, S. E., & Weissinger, E. (1990). Perceptions of boredom in leisure: Conceptualization, reliability and validity of the Leisure Boredom Scale. *Journal of Leisure Research*, 22(1), Article 1. <https://doi.org/10.1080/00222216.1990.11969811>
- Jackson, T. D., & Pepper, M. (2010). Consumerism as theodicy—An explanation of religions and secular meaning functions. In *Consuming Paradise*. University of Surrey.
- Kasser, T. (2002). *The high price of materialism*. MIT Press.
- Kasser, T. (2016). Materialistic values and goals. *Annual Review of Psychology*, 67(1), 489–514. <https://doi.org/10.1146/annurev-psych-122414-033344>
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22(3), Article 3. <https://doi.org/10.1177/0146167296223006>

- Kasser, T., Ryan, R. M., Couchman, C. E., & Sheldon, K. M. (2004). Materialistic values: Their causes and consequences. In *Psychology and consumer culture: The struggle for a good life in a materialistic world* (pp. 11–28). American Psychological Association. <https://doi.org/10.1037/10658-002>
- Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, *11*(4), 348–351. <https://doi.org/10.1111/1467-9280.00269>
- Kazak, A. E. (2018). Editorial: Journal article reporting standards. *American Psychologist*, *73*(1), 1. <https://doi.org/10.1037/amp0000263>
- Kim, J., Seo, J., & Laine, T. H. (2018). Detecting boredom from eye gaze and EEG. *Biomedical Signal Processing and Control*, *46*, 302–313. <https://doi.org/10.1016/j.bspc.2018.05.034>
- Kılıç, A., Van Tilburg, W. A. P., & Igou, E. R. (2020). Risk-taking increases under boredom. *Journal of Behavioral Decision Making*, *33*(3), 257–269. <https://doi.org/10.1002/bdm.2160>
- Kocimska-Bortnowska, A., Gasiorowska, A. (2026). Psychometric validation of the Polish version of the Short Boredom Proneness Scale. *Polish Psychological Bulletin*. Under review.
- Kocimska-Bortnowska, A., Gasiorowska, A., & Van Tilburg, W. A. P. (2026a). Lessons Learned from Intentionally Dull Studies: Methodological Recommendations for Experiments on Boredom. *PsyArXiv*. https://doi.org/10.31234/osf.io/7b4up_v1
- Kocimska-Bortnowska, A., Van Tilburg, W. A. P., Reinhard, P., & Gasiorowska, A. (2026b). Boredom and Financial Behavior: How Boredom Shapes Decision-Making in Auctions. *Journal of Behavioral Decision Making*. Under review after revision.

- Kolas, J., & von Mühlenen, A. (2024). Checking in to echeck out? The Effect of boredom on craving, behavioural inhibition and social networking site use. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-024-01349-2>
- Koles, B., Wells, V., & Tadajewski, M. (2018). Compensatory consumption and consumer compromises: A state-of-the-art review. *Journal of Marketing Management*, 34(1–2), 96–133. <https://doi.org/10.1080/0267257X.2017.1373693>
- Kubose, S. K. (1972). Motivational effects of boredom on children's response speeds. *Developmental Psychology*, 6(2), 302–305. <https://doi.org/10.1037/h0032091>
- Kyrios, M., Fassnacht, D. B., Ali, K., Maclean, B., & Moulding, R. (2020). Predicting the severity of excessive buying using the Excessive Buying Rating Scale and Compulsive Buying Scale. *Journal of Obsessive-Compulsive and Related Disorders*, 25, 100509. <https://doi.org/10.1016/j.jocrd.2020.100509>
- Leong, F. T. L., & Schneller, G. R. (1993). Boredom proneness: Temperamental and cognitive components. *Personality and Individual Differences*, 14(1), 233–239. [https://doi.org/10.1016/0191-8869\(93\)90193-7](https://doi.org/10.1016/0191-8869(93)90193-7)
- LePera, N. (2011). Relationships between boredom proneness, mindfulness, anxiety, depression, and substance use. *The New School Psychology Bulletin*, 8(2), 15–25.
- Li, J., Yang, R., Cui, J., & Guo, Y. (2019). Imagination matters when you shop online: The moderating role of mental simulation between materialism and online impulsive buying. *Psychology Research and Behavior Management*, 12, 1071–1079. <https://doi.org/10.2147/PRBM.S227403>
- Lintott, J. (1998). Beyond the economics of more: The place of consumption in ecological economics. *Ecological Economics*, 25(3), 239–248. [https://doi.org/10.1016/S0921-8009\(97\)00042-6](https://doi.org/10.1016/S0921-8009(97)00042-6)

- London, H., Schubert, D. S., & Washburn, D. (1972). Increase of autonomic arousal by boredom. *Journal of Abnormal Psychology*, 80(1), Article 1.
<https://doi.org/10.1037/h0033311>
- Loukidou, L., Loan-Clarke, J., & Daniels, K. (2009). Boredom in the workplace: More than monotonous tasks. *International Journal of Management Reviews*, 11(4), 381–405.
<https://doi.org/10.1111/j.1468-2370.2009.00267.x>
- Lovitch, M. (2024, September 5). *11 Tips to Prevent Shopping out of Boredom*. SoFi.
<https://www.sofi.com/learn/content/tips-to-prevent-shopping-out-of-boredom/>
- MacDonald, D. A., & Holland, D. (2002). Spirituality and boredom proneness. *Personality and Individual Differences*, 32(6), 1113–1119. [https://doi.org/10.1016/S0191-8869\(01\)00114-3](https://doi.org/10.1016/S0191-8869(01)00114-3)
- Markey, A., Chin, A., Vanepps, E. M., & Loewenstein, G. (2014). Identifying a reliable boredom induction. *Perceptual and Motor Skills*, 119(1), 237–253.
<https://doi.org/10.2466/27.PMS.119c18z6>
- Martarelli, C. S., Bertrams, A., & Wolff, W. (2021). A personality trait-based network of boredom, spontaneous and deliberate mind-wandering. *Assessment*, 28(8), 1915–1931. <https://doi.org/10.1177/1073191120936336>
- Martarelli, C. S., Weibel, D., Popic, D., & Wolff, W. (2024). Time in suspense: Investigating boredom and related states in a virtual waiting room. *Cognition and Emotion*, 38(7), 1080–1094. <https://doi.org/10.1080/02699931.2024.2349279>
- Martz, M. E., Schulenberg, J. E., Patrick, M. E., & Kloska, D. D. (2018). “I am so bored!”: Prevalence rates and sociodemographic and contextual correlates of high boredom among American adolescents. *Youth & Society*, 50(5), 688–710.
<https://doi.org/10.1177/0044118X15626624>

- Maslowsky, J., Jager, J., & Hemken, D. (2015). Estimating and interpreting latent variable interactions: A tutorial for applying the latent moderated structural equations method. *International Journal of Behavioral Development*, 39(1), 87–96.
<https://doi.org/10.1177/0165025414552301>
- Matic, A., Pielot, M., & Oliver, N. (2015). Boredom-computer interaction: Boredom proneness and the use of smartphone. *UbiComp '15: Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, 837–841.
<https://doi.org/10.1145/2750858.2807530>
- Mayjee, V., & Home, J. A. (1994). Boredom effects on sleepiness/alertness in the early afternoon vs. Early evening and interactions with warm ambient temperature. *British Journal of Psychology*, 85(3), 317–333. <https://doi.org/10.1111/j.2044-8295.1994.tb02527.x>
- McCracken, G. D. (1990). *Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods and Activities*. Indiana University Press.
- Mercer, K. B., & Eastwood, J. D. (2010). Is boredom associated with problem gambling behaviour? It depends on what you mean by ‘boredom.’ *International Gambling Studies*, 10(1), 91–104. <https://doi.org/10.1080/14459791003754414>
- Mercer-Lynn, K. B., Bar, R. J., & Eastwood, J. D. (2014). Causes of boredom: The person, the situation, or both? *Personality and Individual Differences*, 56(1), 122–126.
<https://doi.org/10.1016/j.paid.2013.08.034>
- Merrifield, C., & Danckert, J. (2014). Characterizing the psychophysiological signature of boredom. *Experimental Brain Research*, 232(2), 481–491.
<https://doi.org/10.1007/s00221-013-3755-2>
- Mikulas, W. L., & Vodanovich, S. J. (1993). The essence of boredom. *The Psychological Record*, 43(1), 3–12.

- Mlynski, C., Goschke, T., Korb, F. M., & Job, V. (2025). The motivational consequences of boredom. *Cognition and Emotion*. <https://doi.org/10.1080/02699931.2025.2568554>
- Moynihan, A. B., Igou, E. R., & Van Tilburg, W. A. P. (2017). Boredom increases impulsiveness. *Social Psychology*, 48(5), Article 5. <https://doi.org/10.1027/1864-9335/a000317>
- Moynihan, A. B., Igou, E. R., & Van Tilburg, W. A. P. (2021). Existential escape of the bored: A review of meaning-regulation processes under boredom. *European Review of Social Psychology*, 32(1), 161–200. <https://doi.org/10.1080/10463283.2020.1829347>
- Moynihan, A. B., Van Tilburg, W. A. P., Igou, E. R., Wisman, A., Donnelly, A. E., & Mulcaire, J. B. (2015). Eaten up by boredom: Consuming food to escape awareness of the bored self. *Frontiers in Psychology*, 6. <https://www.frontiersin.org/article/10.3389/fpsyg.2015.00369>
- Müller-Boysen, T., Pirla, S., & Pfattheicher, S. (2025). On the relation between boredom and social behavior: A registered report. *Journal of Experimental Social Psychology*, 121. <https://doi.org/10.1016/j.jesp.2025.104804>
- Muthén, B. O., Muthén, L. K., & Asparouhov, T. (2017). *Regression and mediation analysis using Mplus*. Muthén & Muthén Los Angeles, CA.
- Nederkoorn, C., Vancleef, L., Wilkenhöner, A., Claes, L., & Havermans, R. C. (2016). Self-inflicted pain out of boredom. *Psychiatry Research*, 237, 127–132. <https://doi.org/10.1016/j.psychres.2016.01.063>
- Neu, J. (1998). Boring from within. In W. F. Flack & J. D. Laird (Eds.), *Emotions in psychopathology: Theory and research* (pp. 158–170). Oxford University Press.

- Ng, A. H., Liu, Y., Chen, J., & Eastwood, J. D. (2015). Culture and state boredom: A comparison between European Canadians and Chinese. *Personality and Individual Differences*, 75, 13–18. <https://doi.org/10.1016/j.paid.2014.10.052>
- O’Dea, M. K., Igou, E. R., & Van Tilburg, W. A. P. (2024). Preventing boredom with gratitude: The role of meaning in life. *Motivation and Emotion*, 48(1), 111–125. <https://doi.org/10.1007/s11031-023-10048-9>
- O’Dea, M. K., Igou, E. R., Van Tilburg, W. A. P., & Kinsella, E. L. (2022). Self-compassion predicts less boredom: The role of meaning in life. *Personality and Individual Differences*, 186, 111360. <https://doi.org/10.1016/j.paid.2021.111360>
- O’Hanlon, J. F. (1981). Boredom: Practical consequences and a theory. *Acta Psychologica*, 49(1), Article 1. [https://doi.org/10.1016/0001-6918\(81\)90033-0](https://doi.org/10.1016/0001-6918(81)90033-0)
- Park, G., Lim, B.-C., & Oh, H. S. (2019). Why being bored might not be a bad thing after all. *Academy of Management Discoveries*, 5(1), 78–92. <https://doi.org/10.5465/amd.2017.0033>
- Perrin-Wallqvist, R., Archer, T., & Norlander, T. (2004). Adolescents’ fire-setting awareness under boredom: Relation to personality variables. *Psychological Reports*, 94(3 I), 863–871. <https://doi.org/10.2466/pr0.94.3.863-871>
- Pfattheicher, S., Lazarevic, L. B., Westgate, E. C., & Schindler, S. (2021). On the relation of boredom and sadistic aggression. *Journal of Personality and Social Psychology*, 121(3), 573–600. <https://doi.org/10.1037/pspi0000335>
- Pirla, S., & Navarro-Martinez, D. (2022). Does boredom affect economic risk preferences? *Judgment and Decision Making*, 17(5), 1094–1122. <https://doi.org/10.1017/S1930297500009347>

- Raes, H. E., Weiss, E. R., Todman, M., & Tellalian, E. (2024). When inequity leads to boredom: An experimental study with university students. *Psychological Reports*.
<https://doi.org/10.1177/00332941241242405>
- Raffaelli, Q., Mills, C., & Christoff, K. (2017). The knowns and unknowns of boredom: A review of the literature. *Experimental Brain Research*, 236(9), Article 9.
<https://doi.org/10.1007/s00221-017-4922-7>
- Richins, M. L. (2004). The Material Values Scale: Measurement properties and development of a short form. *Journal of Consumer Research*, 31(1), 209–219.
<https://doi.org/10.1086/383436>
- Richins, M. L. (2017). Materialism pathways: The processes that create and perpetuate materialism. *Journal of Consumer Psychology*, 27(4), 480–499.
<https://doi.org/10.1016/j.jcps.2017.07.006>
- Richins, M. L., & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: Scale development and validation. *Journal of Consumer Research*, 19(3), 303–316. <https://doi.org/10.1086/209304>
- Rodin, J. (1975). Causes and consequences of time perception differences in overweight and normal weight people. *Journal of Personality and Social Psychology*, 31(5), 898–904.
<https://doi.org/10.1037/h0076866>
- Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. *Journal of Consumer Research*, 22(3), Article 3. <https://doi.org/10.1086/209452>
- Rucker, D. D., & Galinsky, A. D. (2008). Desire to acquire: Powerlessness and compensatory consumption. *Journal of Consumer Research*, 257–267.
<https://doi.org/10.1086/588569>

- Sansone, C., Sachau, D., & Weir, C. (1989). Effects of instruction on intrinsic interest: The importance of context. *Journal of Personality and Social Psychology*, 57, 819–829.
<https://doi.org/10.1037//0022-3514.57.5.819>
- Sansone, C., Weir, C., Harpster, L., & Morgan, C. (1992). Once a boring task always a boring task?: Interest as a self-regulatory mechanism. *Journal of Personality and Social Psychology*, 63, 379–390. <https://doi.org/10.1037/0022-3514.63.3.379>
- Shi, X., Xu, Y., Liu, Z., Niuorcid, G., Sun, X., & Li, K. (2025). More boring, more craving for smartphone use? The moderating role of fear of missing out. *Journal of Behavioral Addictions*, 14(1), 405–415. <https://doi.org/10.1556/2006.2025.00009>
- Shrum, L. J., Wong, N., Arif, F., Chugani, S. K., Gunz, A., Lowrey, T. M., Nairn, A., Pandelaere, M., Ross, S. M., Ruvio, A., Scott, K., & Sundie, J. (2013). Reconceptualizing materialism as identity goal pursuits: Functions, processes, and consequences. *Journal of Business Research*, 66(8), 1179–1185.
<https://doi.org/10.1016/j.jbusres.2012.08.010>
- Spencer-Mueller, E. K., & Fenske, M. J. (2024). Note-taking for the win: Doodling does not reduce boredom or mind-wandering, nor enhance attention or retention of lecture material. *Quarterly Journal of Experimental Psychology*, 77(8), 1780–1796.
<https://doi.org/10.1177/17470218231222402>
- Stickney, M. I., Miltenberger, R. G., & Wolff, G. (1999). A descriptive analysis of factors contributing to binge eating. *Journal of Behavior Therapy and Experimental Psychiatry*, 30(3), 177–189. [https://doi.org/10.1016/S0005-7916\(99\)00019-1](https://doi.org/10.1016/S0005-7916(99)00019-1)
- Stillman, T. F., & Baumeister, R. F. (2009). Uncertainty, belongingness, and four needs for meaning. *Psychological Inquiry*, 20(4), 249–251.
<https://doi.org/10.1080/10478400903333544>

- Stone, R. A., Blissett, J., Haycraft, E., & Farrow, C. (2023). Emotional eating following a laboratory mood induction: The interaction between parental feeding practices and child temperament. *Food Quality and Preference*, 112. <https://doi.org/10.1016/j.foodqual.2023.105008>
- Stone, R. A., Haycraft, E., Blissett, J., & Farrow, C. (2024). Utilising online paradigms to explore the effect of boredom and sadness on children's snack choice: The role of parental feeding practices and child temperament. *Appetite*, 198. <https://doi.org/10.1016/j.appet.2024.107366>
- Struk, A. A., Carriere, J. S. A., Cheyne, J. A., & Danckert, J. (2017). A Short Boredom Proneness Scale: Development and psychometric properties. *Assessment*, 24(3), 346–359. <https://doi.org/10.1177/1073191115609996>
- Sundberg, N. D., Latkin, C. A., Farmer, R. F., & Saoud, J. (1991). Boredom in young adults: Gender and cultural comparisons. *Journal of Cross-Cultural Psychology*, 22(2), 209–223. <https://doi.org/10.1177/0022022191222003>
- Sundström, M., Hjelm-Lidholm, S., & Radon, A. (2019). Clicking the boredom away – Exploring impulse fashion buying behavior online. *Journal of Retailing and Consumer Services*, 47, 150–156. <https://doi.org/10.1016/j.jretconser.2018.11.006>
- Tam, K. Y. Y., & Inzlicht, M. (2024). Fast-forward to boredom: How switching behavior on digital media makes people more bored. *Journal of Experimental Psychology: General*. <https://doi.org/10.1037/xge0001639>
- Tam, K. Y. Y., Van Tilburg, W. A. P., & Chan, C. S. (2021). What is boredom proneness? A comparison of three characterizations. *Journal of Personality*, 89(4), 831–846. <https://doi.org/10.1111/jopy.12618>

- Tam, K. Y. Y., Van Tilburg, W. A. P., Chan, C. S., Igou, E. R., & Lau, H. (2021). Attention drifting in and out: The Boredom Feedback Model. *Personality and Social Psychology Review*, 25(3), 251–272. <https://doi.org/10.1177/10888683211010297>
- Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, 90(2), 288–307. <https://doi.org/10.1037/0022-3514.90.2.288>
- van Aart, J. V., Bartneck, C., Hu, J., Rauterberg, M., & Salem, B. (2010). How to behave as Alice in Wonderland-about boredom and curiosity. *Entertainment Computing*, 1(3–4), 125–137. <https://doi.org/10.1016/j.entcom.2010.09.003>
- Van Boven, L., & Gilovich, T. (2003). To do or to have? That is the question. *Journal of Personality and Social Psychology*, 85(6), 1193–1202. <https://doi.org/10.1037/0022-3514.85.6.1193>
- Van Der Heijden, G. A. H., Schepers, J. J. L., & Nijssen, E. J. (2012). Understanding workplace boredom among white collar employees: Temporary reactions and individual differences. *European Journal of Work and Organizational Psychology*, 21(3), 349–375. <https://doi.org/10.1080/1359432X.2011.578824>
- van Hooff, M., & Hooft, E. (2014). Boredom at work: Proximal and distal consequences of affective work-related boredom. *Journal of Occupational Health Psychology*, 19. <https://doi.org/10.1037/a0036821>
- Van Hooft, E. A. J., & van Hooft, M. L. M. (2018). The state of boredom: Frustrating or depressing? *Motivation and Emotion*, 42(6), 931–946. <https://doi.org/10.1007/s11031-018-9710-6>
- Van Tilburg, W. A., & Igou, E. R. (2019). The unbearable lightness of boredom: A pragmatic meaning-regulation hypothesis. In *Boredom is in your mind: A shared psychological-philosophical approach* (pp. 11–35). Springer.

- Van Tilburg, W. A. P., & Igou, E. R. (2011). On boredom and social identity: A pragmatic meaning-regulation approach. *Personality and Social Psychology Bulletin*, 37(12), 1679–1691. <https://doi.org/10.1177/0146167211418530>
- Van Tilburg, W. A. P., & Igou, E. R. (2012). On boredom: Lack of challenge and meaning as distinct boredom experiences. *Motivation and Emotion*, 36(2), Article 2. <https://doi.org/10.1007/s11031-011-9234-9>
- Van Tilburg, W. A. P., & Igou, E. R. (2016). Going to political extremes in response to boredom. *European Journal of Social Psychology*, 46(6), Article 6. <https://doi.org/10.1002/ejsp.2205>
- Van Tilburg, W. A. P., & Igou, E. R. (2017a). Boredom begs to differ: Differentiation from other negative emotions. *Emotion*, 17(2), 309–322. <https://doi.org/10.1037/emo0000233>
- Van Tilburg, W. A. P., & Igou, E. R. (2017b). Can boredom help? Increased prosocial intentions in response to boredom. *Self and Identity*, 16(1), 82–96. <https://doi.org/10.1080/15298868.2016.1218925>
- Van Tilburg, W. A. P., Igou, E. R., Maher, P. J., Moynihan, A. B., & Martin, D. G. (2019). Bored like Hell: Religiosity reduces boredom and tempers the quest for meaning. *Emotion*, 19(2), 255–269. <https://doi.org/10.1037/emo0000439>
- Van Tilburg, W. A. P., Igou, E. R., & Sedikides, C. (2013). In search of meaningfulness: Nostalgia as an antidote to boredom. *Emotion*, 13(3), Article 3. <https://doi.org/10.1037/a0030442>
- Vodanovich, S. J., Verner, K. M., & Gilbride, T. V. (1991). Boredom proneness: Its relationship to positive and negative affect. *Psychological Reports*, 69, Article 3. <https://doi.org/10.2466/pr0.1991.69.3f.1139>

- Vodanovich, S., & Watt, J. (2015). Self-report measures of boredom: An updated review of the literature. *The Journal of Psychology, 150*, 1–33.
<https://doi.org/10.1080/00223980.2015.1074531>
- von Gemmingen, M. J., Sullivan, B. F., & Pomerantz, A. M. (2003). Investigating the relationships between boredom proneness, paranoia, and self-consciousness. *Personality and Individual Differences, 34*(6), 907–919.
[https://doi.org/10.1016/S0191-8869\(01\)00219-7](https://doi.org/10.1016/S0191-8869(01)00219-7)
- Watt, J. D., & Hargis, M. B. (2009). Boredom proneness: Its relationship with subjective underemployment, perceived organizational support, and job performance. *Journal of Business and Psychology, 25*(1), Article 1. <https://doi.org/10.1007/s10869-009-9138-9>
- Weibel, D., Martarelli, C. S., Häberli, D., & Mast, F. W. (2018). The Fantasy Questionnaire: A measure to assess creative and imaginative fantasy. *Journal of Personality Assessment, 100*(4), 431–443. <https://doi.org/10.1080/00223891.2017.1331913>
- Westgate, E. C., & Wilson, T. D. (2018). Boring thoughts and bored minds: The MAC model of boredom and cognitive engagement. *Psychological Review, 125*(5), 689–713.
<https://doi.org/10.1037/rev0000097>
- Wisman, A. (2006). Digging in Terror Management Theory: To use or lose the symbolic self? *Psychological Inquiry, 17*(4), 319–327.
<https://doi.org/10.1080/10478400701369468>
- Woods, D. W., & Miltenberger, R. G. (1996). Are persons with nervous habits nervous? A preliminary examination of habit function in a nonreferred population. *Journal of Applied Behavior Analysis, 29*(2), 259–261. <https://doi.org/10.1901/jaba.1996.29-259>
- Wu, L. (2006). *Excessive Buying: The Construct and a Causal Model*.
<https://smartech.gatech.edu/handle/1853/16258>

- Yao, Y., Zhao, X., Ren, L., & Jia, G. (2023). Compensatory travel in the post COVID-19 pandemic era: How does boredom stimulate intentions? *Journal of Hospitality and Tourism Management*, 54, 56–64. <https://doi.org/10.1016/j.jhtm.2022.12.003>
- Yusoufzai, M. K., Nederkoorn, C., Lobbestael, J., & Vancleef, L. (2024). Sounds boring: The causal effect of boredom on self-administration of aversive stimuli in the presence of a positive alternative. *Motivation and Emotion*, 48(2), 222–236. <https://doi.org/10.1007/s11031-023-10053-y>
- Yuvaraj, R., Seshadri, N. P. G., Samyuktha, S., S Fogarty, J., Huang, J. S., Tan, S., & Wong, T. K. (2025). EEG-based functional connectivity patterns during boredom in an educational context. *Scientific Reports*, 15(1). <https://doi.org/10.1038/s41598-025-19245-7>
- Zhang, J. E., Hilpert, B., Broekens, J., & Jokinen, J. P. P. (2024). *Simulating Emotions With an Integrated Computational Model of Appraisal and Reinforcement Learning*. Conference on Human Factors in Computing Systems - Proceedings. <https://doi.org/10.1145/3613904.3641908>
- Zhang, N., Zhan, J., Zhang, X., Zheng, L., & Li, W. (2024). State boredom increases consumers' gift-giving intentions in entertainment live-streaming: A moderated dual-mediation model. *Psychology and Marketing*, 41(8), 1868–1881. <https://doi.org/10.1002/mar.22014>
- Zuckerman, M. (1971). Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology*, 36(1), 45–52. <https://doi.org/10.1037/h0030478>
- Zuckerman, M. (2014). *Sensation Seeking (Psychology Revivals): Beyond the Optimal Level of Arousal*. Psychology Press. <https://doi.org/10.4324/9781315755496>

Supplementary materials for Study 4b

Appendix A1. The experimental tasks employed in Study 4b

Figure A1

The experimental task employed in the buying condition (with two items already selected and a third one being added to the shopping basket)

In the **second task**, we want to test our rewards for participation in the lab study

Imagine that you take part in a study where, for participation, you get rewarded with **5 banknotes**.

You can spend those banknotes on any of the small toys presented below.

Each of the toys costs **1 banknote**, so you can buy a total of **5 toys**. Please choose which toys you would buy and drag them to a shopping basket.



Figure A2

The experimental task employed in the no buying condition (with two items already selected and a third one being added to the pocket area)

In the **second task**, we want to test how people judge the size of objects.

Imagine that you want to put some of the toys presented below into your pocket.

However, only toys that are **small enough** will fit. Please drag the toys that would fit in your pocket into the pocket area.



Appendix A2. The decomposition of the interaction between boredom and buying

(Study 4b)

Table A1

The simple effects of the boredom manipulation on declared state boredom examined within the buying and no-buying condition at three levels of materialism ($M - 1 SD = 30.70$, $M = 42.00$, $M + 1SD = 53.3$)

Materialism	Task type	β	SE	95% CI		t	p
				Lower	Upper		
$M - 1 SD$	no buying	.29	.15	.003	.58	1.98	.048
	buying	.21	.14	-.06	.48	1.51	.132
M	no buying	.42	.10	.21	.62	4.02	.001
	buying	-.002	.10	-.20	.19	-0.02	.984
$M + 1 SD$	no buying	.54	.15	.24	.84	3.52	.001
	buying	-.21	.14	-.48	.05	-1.57	.116

Table A2

The simple effects of the boredom manipulation on declared state desire for meaningful activity within the buying and no-buying condition examined at three levels of materialism ($M - 1 SD = 30.70$, $M = 42.00$, $M + 1SD = 53.3$)

Materialism	Task type	β	SE	95% CI		t	p
				Lower	Upper		
$M - 1 SD$	no buying	.37	.15	.08	.66	2.53	.012
	buying	-.01	.14	-.29	.26	-0.10	.924
M	no buying	.20	.10	-.01	.40	1.90	.058
	buying	-.07	.10	-.26	.13	-0.69	.492
$M + 1 SD$	no buying	.02	.15	-.28	.32	0.13	.895
	buying	-.12	.14	-.39	.14	-0.91	.365