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Memory Decay and Intention Retention: The Role of Stressful vs. Calm Environments and the Respective Use of Reminders

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Abstract

This research explores whether stressful or calm environments affect the decay of people's intentions, and whether they also influence individuals' use of reminders to support memory retention. Grounded in theories like the Theory of Planned Behavior and Implementation Intentions, a between-subjects online experiment randomly assigned participants to either a calm or a stressful scenario. Contrary to the initial hypotheses that stress would accelerate intention decay and increase reliance on reminders, the findings revealed no direct effect of environment on either measure. Instead, two personal factors, mood and age, emerged as prominent predictors of confidence in remembering future tasks. In particular, participants who reported a more positive mood or who were older generally displayed higher intention scores, regardless of their assigned scenario. These results suggest that asking participants to reflect briefly on a stressful or calming scenario may not generate the sustained emotional impact needed to alter intention levels or reminder usage. Instead, mood and age play a stronger role in shaping follow-through on future tasks, highlighting the importance that personal well-being and life context are crucial in determining whether intentions translate into action.

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Sumário

Esta investigação avalia se ambientes stressantes ou tranquilos influenciam a deterioração das intenções e a utilização de lembretes para apoiar a memória. Com base na Teoria do Comportamento Planeado e nas Intenções de Implementação, foi realizado um estudo online em que os participantes foram aleatoriamente colocados num cenário calmo ou stressante.

Contrariando as hipóteses iniciais, não se detetou qualquer efeito direto do ambiente sobre a deterioração das intenções ou o uso de lembretes. Em vez disso, dois fatores pessoais - humor e idade - surgiram como preditores principais de confiança na recordação de tarefas futuras, com participantes mais velhos ou de melhor disposição a apresentarem intenções mais fortes, independentemente do cenário. Estes resultados sugerem que uma breve reflexão sobre um cenário stressante ou tranquilizante não gera impacto emocional suficiente para alterar níveis de intenção ou o recurso a lembretes. Em contrapartida, o humor e a idade desempenham um papel mais marcante no cumprimento de tarefas futuras, sublinhando a importância do bem-estar pessoal e do contexto de vida para que as intenções se concretizem em ação.

Título: *Decaimento de Memória e Retenção de Intenções: O Papel de Ambientes Stressantes vs. Calmos e a Utilização Respetiva de Lembretes*

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Palavras-chave: *Decaimento de Memória, Retenção de Intenções, Ambientes, Lacuna Intenção-Comportamento, Papel dos Lembretes*

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List of Abbreviations

TPB ..... Theory of Planned Behavior
TRA ..... Theory of Reasoned Action
PM ..... Prospective Memory
MMSE ..... Mini-Mental State Examination
REM..... Rapid Eye Movement
VIF..... Variance Inflation Factors

1 Introduction

1.1 Opening thought

Imagine learning something new in the calm serenity of an underwater setting versus the harsh, unfamiliar terrain of Mars. Virtual reality research shows that we're more likely to recall information when the environment in which we learned it matches the one where we try to remember it (Shin et al., 2020). But what if these environments do more than just match our learning conditions - what if they actually influence our stress levels? Could a hectic, high-pressure workplace or a peaceful, quiet café not only affect our memory but also shape how we follow through on our intentions?

1.2 Relevance of the topic and problem statement

Extensive research on the intention-behavior gap has shown that people often fail to follow through on their intentions (Conner & Norman, 2022). While various frameworks, ranging from the Theory of Planned Behavior to Implementation Intentions Theory, have advanced our understanding of why intentions sometimes fail to translate into behavior, they typically concentrate on factors like social norms, attitudes and self-efficacy (Ajzen, 1985; Gollwitzer & Brandstätter, 1997). Meanwhile, the role of contextual factors, such as different types of environments, is often overlooked (Conner & Norman, 2022). This gap is particularly relevant because emerging evidence indicates that stressful or calm settings can significantly shape cognitive resources and potentially alter people's capacity to remember and carry out future tasks (Beilock & DeCaro, 2007; Fernandes, 2024; McEwen & Sapolsky, 1995). In parallel, research on memory for intentions ("prospective memory") has shown that people often underestimate the speed at which they forget to perform tasks over a delay, commonly referred to as *intention decay* (Fernandes, 2024). While memory decay is one of the oldest and most well-documented phenomena in psychology (Ebbinghaus, 1885; Murre & Dros, 2015), it still seems to catch individuals by surprise when it comes to prospective tasks (McDaniel & Einstein, 2007). Recent studies suggest that while individuals can recall intentions relatively well shortly after forming them, their actual memory performance declines significantly over days or weeks (Fernandes, 2024). At the same time, these studies show that people's predicted memory for future tasks remains comparatively stable, dropping far less

over the same period (Ericson, 2011; Letzler & Tasoff, 2014). As a result, individuals fail to use reminders at moments when they would have benefited most (Fernandes, 2024).

Despite these findings, little research has explored the specific ways in which different environments (stressful or calm) might accelerate or slow down memory decay for future tasks, and whether that then influences the decision to set reminders. Stressful contexts may further compromise cognitive capacity, while calm settings might enable individuals to maintain stronger intentions over time (Beilock & DeCaro, 2007; McEwen, 2012). Yet these possibilities remain largely untested in the literature, leaving a significant gap in understanding how environmental conditions interact with intention formation, memory decay, and compensatory strategies like using digital tools, alarms, or written reminders (Risko & Gilbert, 2016).

1.3 Research Question and Objectives

The research on the intention-behavior gap often overlooks the role of environmental contexts in shaping memory and follow-through. This study focuses on how different environments, such as stressful or calm ones, impact individuals' ability to retain and act on their intentions. Specifically, it explores the potential for stressful settings to accelerate the decay of intentions, compared to calm environments, and examines whether these differences influence the likelihood of using reminders as a compensatory strategy. The study aims to address the identified research gap with the research question formulated as follows:

How do different environments (e.g., stressful vs. calm) influence the decay of intentions over time, and how does this affect individuals' use of reminders to support behavior change?

2 Theoretical background

2.1 Behavioral Change Theories

In the following we discuss three fundamental theories of behavioral change which are particularly relevant to our research, providing a comprehensive theoretical framework and the foundation for our model. Theories of behavior change provide conceptual frameworks for navigating the complexity of human social behavior and aim to explain the factors that drive individuals' actions. We begin with the Theory of Planned Behavior by Icek Ajzen (1985),

which explains partly why people do or do not follow through on their intended actions. Followed by the Implementation Intentions Theory, we gain more insights on the differences in goal-directed behaviors (Gollwitzer & Brandstätter, 1997.). Finally, we discuss Prospect Memeory, which plays a significant role in the behavioral change theory since its introduction in 1977 by Meacham and Singer.

2.1.1 Theory of Reasoned Action and Theory of Planned Behavior

The Theory of Planned Behavior (TPB) originated in 1985, developed by Icek Ajzen, who also co-created the Theory of Reasoned Action (TRA) with Martin Fishbein in 1975. TRA served as the base for further studies, designed to predict volitional behavior and to help us understand its psychological determinants. Behaviors of everyday life are considered volitional behavior, such as calling your parents at the end of the day, buy toothpaste or vote for your favourite canidate on election day (Heilbroner et al., 1980; Fishbein & Ajzen, 1975). The theory states, that intentions (what people plan to do or not do) is the most immediate and direct predictor of whether they will actually perform the behavior. However, intentions are subject to change, particularly over time. The likelihood that something unforeseen will occur that changes a person's plan increases with the amount of time that passes between when they decide to do something and when they actually need to do it (Ajzen, 1985). The next step is to determine the factors that influence intentions, as our goal is to understand human behavior rather than only predicting it. Therefore two key components are taken into account: personal influence and social influence (“subjective” norms). The personal factor describes a person's attitude towards a particular behavior, which can be either positive or negative. On the other hand, social influence describes the perceived pressure from others to engage in or refrain from a behavior. In relation to the perceived expectations of others, the social factor is referred to as the “subjective” norm. In general, people are more likely to engage in a behavior if they think it is expected of them by others and if they evaluate it positively themselves (Fishbein & Ajzen, 1975; Ajzen, 1985). Based on a situation, the importance of the two factors, attitude and social norms, vary. Social norms have a greater influence on intentions in cooperative situations, while in competitive situations personal attitudes are more important (Ajzen & Fishbein, 1970).

The extension research, TPB, adds a third component to the model – perceived behavioral control – behaviors which aren’t entirely within a persons control. The empirical evidence shows, that this factor helps to explain why people may not act on their intentions when they lack the skills, opportunities or resources they need to succeed. In some cases, perceived behavioral control directly influences the behavior, not just the intention. These situations

typically arise when individuals have an accurate perception of their level of control, yet their overall volitional control is limited, or when their motivation is high despite challenging circumstances. Furthermore, the theory links subjective norms, attitudes and perceived control to specific behavioral beliefs: 1. Normative beliefs influence subjective norms; 2. Behavioral beliefs affect attitudes; 3. Control beliefs determine perceived control. Normative beliefs are about what others think and whether you care about their opinion. Behavioral beliefs are about the outcome of the behvior, which means ones attitude will be positive if the behavior lead to a good result and on the other hand it will be negative if the actions consequencs will have bad consequences. Control beliefs are about whether the person is more or less in control of the action. Believing in your skills and resources helps feeling under control where on the other hand too many obstacles lead to feeling less in control. Furthermore the empirical evidence shows that perceived behavioral control and attitudes are generally stronger predictors of intention than subjective norms. By combining intentions with perceived behavioral control, we see improvement in the prediction of actual behavior (Ajzen, 1991).

In further research, Conner and Armitage (1998) explore how the model of TPB can be refined and identified six potential variables which can improve its predictive accuracy. Adding the variable of *past behavior and habits* showed a strong relevance as a predictor of future behavior since repeated actions often lead to habits that minimize the role of conscious decision-making. Even when other TPB components like attitudes, subjective norms, and perceived behavioral control are taken into account, the empirical reseach proves that past behavior consistently explains additional variance in intentions and behavior. The five following additions are reviewed: belief salience measures, perceived behavioral control vs. self- efficacy, moral norms, self-identity, and affective beliefs. In all cases, there seems to be increasing empirical evidence supporting their extension in the TPB, as well as an understanding of the processes by which they might be associated with other TPB variables, intentions, and behavior. Our study builds upon the groundbreaking TPB by Ajzen, which has been shown to effectively predict behavior in contexts where external factors influence volitional control. By incorporating external environmental conditions (stressful vs. calm) as a moderating factor, our study further investigates its impact on intention formation and behavior. However, it also expands TPB by introducing memory decay as a critical variable, addressing the cognitive mechanisms underlying the intention-behavior gap. More recent studies from Orbell and Verplanken (2020) suggest to integrating the factors of habitual behaviors into TPB to better predict and influence behavior in real-world contexts.

2.1.2 Implementation Intentions Theory

The concept of implementation intentions is explored by Gollwitzer and Brandstätter (1997) and demonstrates that implementation intentions enhance goal achievement by linking specific contexts to specific actions. Implementation intentions are a self-management strategy that helps people turn their goals into actions by creating a specific "if-then" plan. The research focuses on two factors, motivational and volitional, and how they interact together to increase the effectiveness of goal pursuit. To explore the interaction between the two factors in greater detail, motivation alone is addressed first, as emphasized in traditional theoretical frameworks. How much someone wants to achieve a goal, depends on two factors: Firstly, if people think the goal is worth it, they're more motivated (i.e., expected values, Atkinson, 1957). Secondly, the belief in their ability to succeed (control beliefs, Ajzen, 1985; self-efficacy beliefs, Bandura, 1982; action-outcome expectations, Heckhausen, 1977).

More recent theories focus on volitional self-regulation to explore how people manage to act on their goals. Strategies for selective attention, emotion regulation, and environmental management are highlighted in Kuhl's Action Regulation Theory (1984). These strategies support people in staying focused and successfully executing goal-directed actions despite possible distractions or competing priorities (Kuhl & Beckmann, 1994). A great example of a volitional strategy that bridges the gap between intention and action is implementation intentions. Using this strategy as a bridge between motivation (why you care about a goal) and action (how you act on it) because motivations on it own is often not enough to achieve a goal due to the lack of a clear plan of action. The empirical evidence underlines, that combining strong implementation intentions with strong motivation leads to the highest rates of goal success (Gollwitzer & Brandstätter, 1997). Further reseach identified conditions under which implementation intentions are most effective. Firstly, when it is easy to predict situational cues and link them to specific actions and secondly when the goal is well-defined and specific. The evidence shows a broad applicability of implementation intentions by highlighting the succsess in improving behaviors related to academics, health, and interpersonal relationships (Gollwitzer & Sheeran, 2006). Since implementation intentions rely on linking situational cues to specific actions, our study aims to provide insights into how different environments influence the strength of intentions to support goal-directed behavior.

2.1.3 Prospective Memory

The ability to recall performing an intended action at the right time in the future is known as prospective memory (PM). We continuously depend on it for both minor and major tasks, making it an essential part of our everyday life. Examples include routine tasks like mailing a letter, picking up bread on the way home, sending a message to a flatmate or putting a bicycle in the car for a trip after work. PM is just as important in work environments as it is in one's private life. Before a seminar, a teacher must ensure that the materials for the class are prepared and available, and a waiter must remember to bring extra cream for a table on their next trip to the kitchen. It is also crucial for life-sustaining actions, such as remembering to take prescription medications on time (McDaniel & Einstein, 2007). We differentiate between two types of PM: event-based and time-based prospective memory. Event-based means that a person remembers to act when a specific event occurs, such as getting a notification from your reminders app. Time-based means that a person remembers to act at a certain time or after a set period, such as taking medicin at 12am. These tasks can be more challenging because they rely heavily on self-initiated processes. Furthermore, the research shows that three moderating factors significantly influence PM performance: the type of task, cognitive health, and specific underlying cognitive abilities. More established neuropsychological tests (e.g., Rivermead Behavioral Memory Test), which are well-designed and more similar to real-life tasks, are better at identifying PM problems. Since PM can be complex, a persons' cognitive function can significantly impair the overall performance. Finally the last factor focuses on ones' underlying cognitive abilities. For example, if individuals score lower in the screensing tool Mini-Mental State Examination (MMSE) they also show a greater deficits in PM performance (Román-Caballero & Mioni, 2023).

2.2 Memory Decay and Cognitive Load

There has been plenty of debate about decay as a forgetting mechanism in the history of research. According to early studies, including John Brown's groundbreaking research *Some Tests of the Decay Theory of Immediate Memory* (1958), forgetting takes place when memory traces gradually decline over short periods of time, particularly when attention gets diverted to other tasks. Brown highlighted the significance of time-based decay in immediate memory by showing that even short delays filled with irrelevant activities could affect recall ability. Despite its fundamental role the decay theory has faced sceptisism. The majority of forgetting, according to critics, is explained by interference rather than degradation. On the other hand,

Brown argues against, that interference may be a secondary effect of trace weakening. This is also supported by recent neuroscience research, highlighting that decay may be an active, controlled process, especially during sleep phases like rapid eye movement (REM), where irrelevant memories are deleted to maximise cognitive efficiency. Most of the memories that are routinely created throughout the day are irrelevant, which is the reason why it is extremely important to eliminate such unnecessary memories to keep the overall system functioning. A better understanding of some illnesses, including Alzheimer's disease, may result from seeing decay-like forgetting as a regulated and controlled element of memory (Hardt, Nader, & Nadel, 2013). Furthermore, the work of Barrouillet, Bernardin, and Camos (2004) supports the role of cognitive load in memory decay, emphasizing that attention plays a pivotal role in maintaining memory traces. They introduce the time-based resource-sharing model, underscoring that the cognitive load associated with an activity depends on the percentage of time it takes to occupy attention, hence hindering other processes that require attention. Consequently the study from Barrouillet et al. (2007) shows that the longer you try to balance memory maintenance and another attention-demanding task, the more your recall suffers, though this effect is limited to the task's duration. Since both rely on the same limited amount of working memory attentional resources, the interference is not specific to any one sort of information (for example, verbal memory can be affected by spatial activities). This demonstrates how working memory is time-based and sequential, storing, processing, and updating information via shared attention.

Building on this, Fernandes (2024) highlights that individuals often underestimate the speed at which their memory for future tasks decays. While actual memory performance declines rapidly - sometimes within as little as 10–30 minutes - people consistently predict they will remember tasks much longer, resulting in overconfidence in their memory abilities. This disconnect between perceived and actual memory decay underscores the cognitive challenges of prospective memory, where internal processes are overestimated, leading to avoidable forgetting when external aids, such as reminders, are not employed. Building on the evidence that cognitive load impacts memory decay, we hypothesize that stressful environments may consume more cognitive capacity, thereby reducing individuals ability to retain and act on intentions. Research on stress and cognitive load highlights that individuals with higher working memory capacity perform better in low-pressure situations using logical, resource-heavy strategies. In contrast, under high-pressure conditions, their performance declines as they switch to simpler, less accurate strategies (Beilock & DeCaro, 2007). Additionally Schoofs, Wolf, and Smeets (2009) found that stress makes it harder to perform challenging tasks that

require both working with information and holding onto it. This highlights the importance of studying how environmental stress influences memory decay and the mechanisms, such as reminders, that may compensate for this effect.

2.3 The influence of different environments

Research underscores that environments play a pivotal role in shaping individual stress levels and subsequent behaviors (Taylor et al., 1997; McEwen & Sapolsky, 1995). Our stress levels, memory, and general behavior are significantly impacted by the environments in which we live and work (McEwen, 2012). It is helpful here to distinguish between chronic stress – prolonged exposure that can lead to lasting physiological and psychological changes – and short-term or momentary cognitive load, which arises from immediate demands on attention and processing (Barrouillet et al., 2004, McEwen & Sapolsky, 1995). Stressful environments, such as high-pressure workplaces or unsafe communities, create conditions where people are constantly under strain (Sapolsky et al., 2000). Taylor et al. (1997) explain how these environments contribute to chronic stress, which wears down the body over time, making people more vulnerable to physical and mental health issues. Stress doesn't just affect health outcomes; it also limits people's ability to cope effectively, develop supportive relationships, and feel in control of their circumstances. On the other hand, calm and supportive environments can act as a buffer, promoting resilience, encouraging social connections, and fostering a sense of stability and safety. In small doses, stress can actually help people focus and form memories. However, when stress becomes constant, it overwhelms the brain's ability to function properly. People start to forget important details, struggle to stay organized, and feel mentally exhausted. This pattern is particularly harmful when stress drags on without relief, as it can disrupt the processes that help us learn and remember (McEwen and Sapolsky, 1995). Further evidence from McEwen (2012) highlights how chronic stress can change how the brain works over time, leading to difficulties in managing emotions, making decisions, and remembering things. The positive aspect is that these effects aren't necessarily permanent. Supportive environments, physical activity, and even therapy can help undo some of the damage and improve mental clarity. Similarly, Sapolsky et al. (2000) explain that while short-term stress can sharpen our responses to challenges, prolonged stress creates fatigue and reduces the ability to learn or adapt. Lastly, Cohen et al. (1978) emphasize how stressful situations drain mental energy, making it harder to focus on tasks or adapt to unexpected changes. People in stressful conditions

often miss important social cues and become less flexible in their thinking, which can affect relationships and decision-making.

Taken together, these findings underline the importance of context. Stressful environments limit our mental resources, making it harder to remember tasks, follow through on intentions, and cope with challenges. Calm and supportive environments, by contrast, help people manage stress, stay focused, and build resilience. This study builds on these insights by exploring how different environments influence intention formation, memory decay, and the use of reminders. By investigating the connection between external conditions and internal processes, this research aims to uncover new ways to support behavior change and improve cognitive performance.

2.4 Reminders and behavior change

To reduce the cognitive demands of a task we refer to a cardinal feature of human cognition called cognitive offloading: using external resources and physical action instead of relying only on our internal processes (Risko & Gilbert, 2016). It is an adaptive strategy that allows individuals to overcome memory and processing limitations. Instead of remembering an upcoming event, we might set a reminder in our smartphone app or use a pen to write a note. The probability of successfully completing intents is significantly increased by this process, especially for activities involving prospective memory (remembering to perform actions in the future) (Fernandes, 2024). For instance, having a calendar alert as an external reminder increases the likelihood that people will complete a task or meeting. Additionally, Risko and Gilbert (2016) research points out a shift from content to location: Offloading can lead individuals to remember where the information is stored (e.g., "I wrote it down in my notebook") rather than the actual content of the information. This shift can sometimes backfire if the external aid becomes inaccessible. Gilbert et al. (2019) add to these findings by highlighting that using tools like reminders comes with a cost (time/effort to set them up) and a benefit (better memory and task completion). With this being said, their analysis idnetifies that people often rely on reminders more than necessary, even when it’s not the best choice.

3 Data and Methods

3.1 Hypothesis

Building on the existing literature, this study explores how different environments influence memory decay and the use of reminders. The following Hypotheses were posed to answer the research question of this study:

H1: Individuals in stressful environments will exhibit a higher rate of memory decay for future tasks compared to those in calm environments.

H2: Individuals in stressful environments will be more likely to use reminders to compensate for the anticipated or experienced decay of intentions compared to those in calm environments.

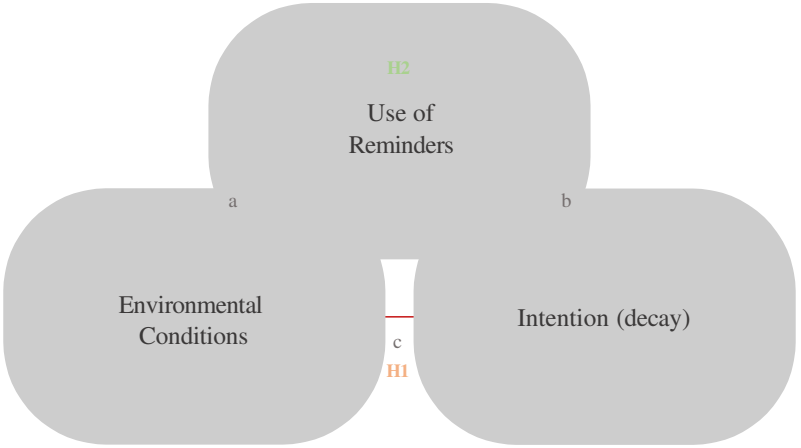

Figure 1: Conceptual Model

3.2 Research Design

The aim of the study is to investigate the effect of different environments (stressful and calm) on the decay of individuals intention to action a task in the (near) future and how this affects individuals' use of reminders to support behavior change.

A quantitative approach was used to answer the research question and to build upon earlier research regarding the importance of environmental factors in shaping intention formation and

follow-through. To test the causality of the hypothesized relationships, a between-subjects experimental design was selected (Hulland et al., 2017) and implemented through an online questionnaire carried out with Qualtrics. The questionnaire was distributed online among people between the age of 18 and 62 years old. A “between-subjects” experimental design was chosen in which each participant is exposed to just one treatment condition. Participants were randomly assigned to one of the following groups and provided with a brief scenario:

- **Calm Condition**: Participants in this group were asked to imagine a situation that they personally find calm and relaxing. For example, we suggested thinking about taking a walk in the park, having a day at the beach, reading a book, or listening to music. After picturing this scene, they were asked, “How calm do you feel when you think about this?” and responded on a seven-point scale ranging from “Not calm at all” to “Extremely calm.” This allowed us to check whether they actually felt calmer after visualizing the scenario.
- **Stressful Condition**: Participants in this group were asked to think about a major global issue they find stressful, such as climate change, inflation, war, or pandemics. They then answered, “How stressed do you feel when you think about this?” also using a seven-point scale from “Not at all stressed” to “Extremely stressed.” By collecting these ratings, we could verify if the stressful scenario successfully made participants feel more stressed.

This approach aimed to create two clearly different emotional states, ensuring that one group experienced a calm mental environment while the other faced a more stressful one. By comparing the responses of individuals in these two groups, we can gain a better understanding of whether and how the environment influences their intentions. As Charness, Gneezy, and Kuhn (2012) note, random assignment to different conditions enables researchers to make stronger claims about causality by controlling for confounding variables. In this case, any differences in intention decay or reminder usage can be more confidently attributed to the difference in environmental conditions rather than to other factors. In order to obtain a more comprehensive explanation of the causal effect investigated, the use of reminders is treated as a mediating variable, hypothesized to influence the effect of different environments (stressful and calm) on the decay of individuals' intention. The role of reminders is measured in both groups.

3.3 Sampling and Participants

Between November 11th and November 22nd, a total of 178 surveys were completed. However, 37 participants had to be excluded from the survey due to missing data or not answering the attention question correctly. This led to a total valid sample of 141 participants (56.5% female / 43.5% male) with an age range from 18 to 62 years (M = 27.97, SD = 6.22). To summarize, 75 participants were randomly assigned to the calm environment and 70 to the stressful environment (51.72% calm / 48.28% stressful). Among the participants, digital reminders such as calendar apps were the most frequently chosen, with 59 participants (40.69%) indicating this preference. Phone alarms followed, used by 31 participants (21.38%). A notable 36 participants (24.83%) indicated that they would not use a reminder at all. Written notes were selected by 15 participants (10.34%), while verbal reminders from someone and other reminder types were each chosen by only 2 participants (1.38%). This distribution highlights a strong inclination towards digital tools and phone-based reminders for task management among the participants.

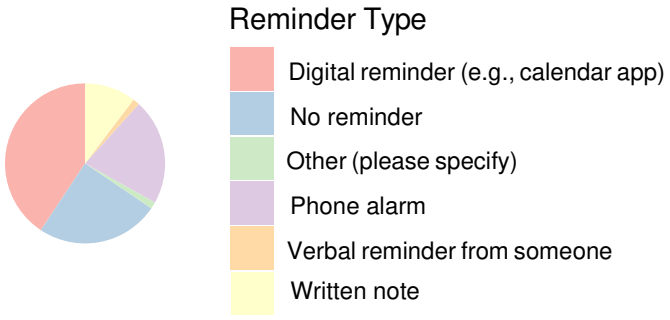

Figure 2: Distribution of Reminder Types Among Participants

3.4 Procedure

The data was collected using a voluntary response sampling technique, a type of probability sampling. The voluntary participants were recruited through social networks such as LinkedIn, WhatsApp, and Instagram. After a brief introduction of the study, the next step was a random assignment of each participant to the two scenario groups: stressful and calm. The study measured intention decay as the primary dependent variable, with environmental conditions as the independent variable. Reminder usage served as the mediating factor, and combined mood

ratings (asked immediately after each treatment condition was presented) were included as covariates. An attention check question was designed to make sure participants were paying attention to the questions and later used for cleaning of the data set; those who failed were excluded from the final data set. Finally, demographic information (e.g., age, gender, nationality, degree, occupation) was collected.

3.5 Variables

3.5.1 Dependent Variable

Intention. This study defines intention decay as the primary dependent variable. Intention decay reflects the change in confidence and perceived effort required to complete a task over time. Participants responded to three questions on a seven-point Likert scale (1 = Not at all; 7 = Extremely) to assess their confidence in remembering a task and the mental effort required to recall it without external aids. One example item is, "How confident are you that you will remember to complete this task without setting a reminder?" The average score across these items was calculated to represent the overall intention level for each participant. The higher the score, the greater the participant's confidence and intention to complete the task.

3.5.2 Independent Variable

Environments. The independent variable in this study is the environmental condition. Participants were assigned to either a calm or a stressful scenario and rated how calm or stressed they felt using a seven-point Likert scale. Based on this assignment, the environmental condition was represented as a binary variable, coded as:

- 1 for stressful environments
- 0 for calm environments

3.5.3 Mediator

Reminder. Reminder was treated as the mediating variable to examine its role in compensating for intention decay across different environments. This variable was assessed using two Likert-scale questions ranging from 1 (Not at all) to 7 (Extremely). The first question evaluated the importance of reminders, and the second assessed the likelihood of setting reminders. An example question is, "How important do you think setting a reminder will be to ensure you don't forget this task?" The average score of these items was computed to represent participants' overall use of reminders. Higher scores indicate greater reliance on reminders.

3.5.4 Control Variables

Age. Age was captured as an open-ended numerical response.

Gender. Gender was captured using multiple options to ensure inclusivity. Participants could identify as male, female, non-binary/third gender, or choose the option "prefer not to say."

Occupation. Participants' employment status was categorized into predefined options: student, employed full-time, employed part-time, freelance, and other.

Education levels. To understand the potential influence of educational attainment on cognitive processes, participants were asked to indicate their highest level of education. The response options included high school diploma, associate's degree, bachelor's degree, master's degree, doctorate, and "prefer not to say."

Reminder Type. To explore how participants engage with reminders, data was collected on the type of reminder they typically use for daily tasks. Options included digital reminders (e.g., calendar apps), phone alarms, written notes, verbal reminders from others, and other forms of reminders with a text box for further specification. This variable helps control for potential differences in how participants organize their daily tasks and manage commitments.

Mood Ratings by Scenario Group. Participants' moods were assessed after exposure to the calm or stressful scenario to understand the immediate emotional impact of these environments. Using a Likert scale ranging from very negative to very positive, participants rated their emotional state. These mood ratings were analyzed separately for the calm and stressful groups to identify baseline differences in emotional responses. Controlling for mood ensures a more accurate interpretation of the impact of environments on memory decay and intention retention.

3.6 Statistical Method and Analysis

For statistical computing and analysis, R-Studio was used. Descriptive statistics were presented to gain an overall understanding of the respondents' demographics, distributions and the overall data set. This provided an initial overview of the sample composition and key variable distributions, ensuring the data met the assumptions required for further analysis. In addition, Cronbach's Alpha was conducted for reliability testing.

To test the effect of environmental conditions on intention (H1), a linear regression analysis was conducted. In this model, intention (DV) was regressed on environmental conditions (IV), while controlling for several covariates: gender (dgender), age, occupation, education level (degree_num), and mood (mood_combined). This comprehensive model accounted for potential confounding effects, providing a clearer understanding of the relationship between environmental conditions and participants' intentions. The results of the regression were exported using the stargazer package, ensuring a clear presentation of the findings. The analysis assessed the statistical significance of each predictor while checking for potential issues such as multicollinearity or non-normality of residuals.

For H2, a mediation analysis was performed using the PROCESS macro developed by Hayes (2013). Specifically, model 4 was applied to examine whether the use of reminders mediated the relationship between environmental conditions (IV) and intentions (DV). Path a captured the effect of environmental conditions on the mediator (use of reminders), path represented the effect of the mediator on intention, and path c´ reflected the direct effect of environmental conditions on intention, controlling for the mediator.

4 Results

4.1 Data Analysis

After preparing the data in Excel and removing incomplete or invalid responses, we imported the data set into RStudio for a systematic and transparent analysis. By examining the descriptive statistics, we gain an overall understanding of the sample and the key variables of interest. Following this initial overview, we assessed the reliability of our scales using Cronbach's alpha before proceeding with regression analyses and a mediation model (Hayes, 2013).

4.2 Scale Reliability

To assess the internal consistency of the composite measures, Cronbach's alpha was computed for both the intention and reminder scales. For the intention scale, composed of three items, the alpha was 0.70 (standardized alpha = 0.73), indicating good internal consistency (Field, 2013). Although one item was flagged as negatively correlated with the principal component and automatically reversed, the overall reliability remained adequate, suggesting the three items

collectively measured a coherent construct of intention. For the reminder scale, consisting of two Likert-type items (reminder_1, reminder_3), Cronbach's alpha was 0.75, again indicating acceptable reliability. As with the intention scale, one item required automatic reversal to improve internal consistency. This result suggests that the two reminder items work well together to capture the importance and likelihood of using reminders as a supportive strategy.

4.3 Data Preparation and Descriptive Statistics

In the following the descriptive statistics of the key variables and their interrelationships are highlighted from the R-based analyses. By doing so, we gain an initial overview of the data before proceeding to the main hypothesis tests.

An examination of the intention measure revealed that, on average, participants reported moderate confidence in remembering and completing the intended task (M = 4.11, SD = 0.85). When considering the environmental conditions, participants assigned to the calm scenario exhibited a slightly higher mean intention score (M = 4.25, SD = 0.93) compared to those in the stressful scenario (M = 3.96, SD = 0.82). Although this difference aligns directionally with the notion that stress may reduce confidence in prospective memory tasks, it appears relatively small prior to controlling for covariates. Figure 3 provides a visual comparison of intention scores across the two environmental conditions, illustrating the observed differences between participants in the calm and stressful scenarios. The F-statistic (F = 4.461, p < 0.001) confirms that the overall model is significant, though the specific effect of the environment on intention did not reach statistical significance

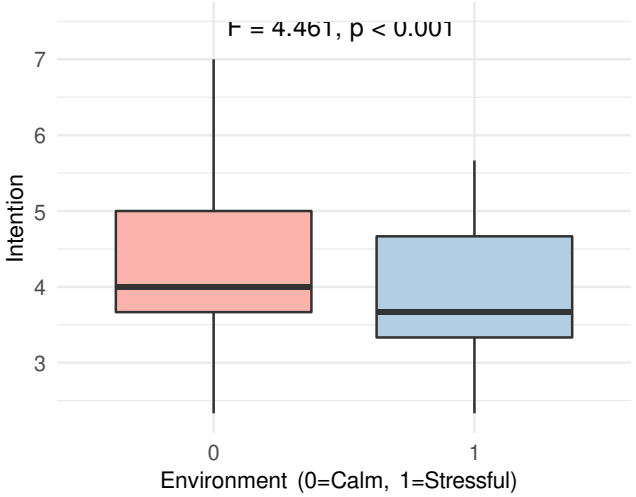

Figure 3: Intention Scores Across Environmental Conditions

In terms of support strategies, the overall reminder score (M = 4.03, SD = 0.89) indicates a moderate inclination to rely on external aids. While the distribution of specific reminder types was presented in Chapter 3.3, these averaged ratings of reminder importance and likelihood now serve as a composite measure of the extent to which participants consider offloading their memory demands.

In terms of support strategies, participants on average showed a moderate tendency to rely on external aids (M = 4.03, SD = 0.89). Although we previously detailed which types of reminders they preferred in Chapter 3.3, this combined score now gives us a single measure showing how much, on the whole, participants considered using reminders to help them remember.

The manipulation of mood through the scenario conditions was reflected in the aggregated mood ratings, with the calm scenario group reporting a more positive mood (M = 5.58) than the stressful scenario group (M = 3.85). This significant difference suggests that the environmental manipulation influenced participants' immediate emotional states, potentially shaping their cognitive and motivational responses. Correlational analyses provided preliminary insights into relationships among the central variables. Intention displayed a small negative correlation with environment (r = -0.17), hinting that participants in the stressful condition were somewhat less confident in remembering the task. Reminder usage, however, demonstrated only a weak positive correlation with intention ($r \approx 0.07$), suggesting that a higher tendency to use reminders was not strongly associated with increased confidence in prospective recall. In contrast, both mood and age showed more pronounced positive correlations with intention, indicating that participants who felt more positive or were older tended to report stronger intention levels. Finally, checks for normality indicated that none of the primary variables were heavily skewed (all skewness values $< |1|$), supporting the suitability of parametric procedures for the subsequent analyses.

In summary, while the initial descriptive statistics and correlations are not definitive tests of our hypotheses, they provide a clearer starting point. They show that participants in the calm condition, on average, reported slightly higher intention and more positive mood, but the observed differences were subtle at this stage. Likewise, the limited association between reminder usage and intention highlights the complexity of linking external memory aids to prospective behavior. These initial insights underscore the importance of moving on to a more detailed analysis to fully address the research questions at hand.

4.4 Hypothesis Testing

H1: Influence of Environmental Conditions on Intention

Our first hypothesis proposed that being in a stressful environment would lead to a greater decay in intention, meaning that participants in the stressful scenario would show lower intention scores than those in the calm scenario. To test this, we performed a linear regression analysis using intention as the dependent variable and *environment* (0 = Calm, 1 = Stressful) as the main predictor. The model controlled for demographic and contextual covariates like gender, age, occupation, education level, and combined mood to ensure a more accurate understanding of the environment's unique contribution.

The overall regression model was significant, $F(6, 138) = 4.461$, $p < .001$, and explained approximately 16.24% of the variance in intention ($R^2 = 0.1624$). However, the coefficient for environment was not significant ($b = 0.1478$, $SE = 0.1911$, $t = 0.7735$, $p = 0.4405$), suggesting that the immediate stress induced by the scenario might not have been strong enough to impact participants' intention scores. This indicates that, contrary to what was expected, simply placing participants in a stressful scenario did not lead to a statistically reliable drop in their reported intention levels when other factors were considered. Instead, *mood_combined* and age emerged as more meaningful predictors. *mood_combined* showed a positive and significant relationship with intention ($b = 0.2430$, $p = 0.0014$), suggesting that participants who felt more positive or calm reported higher intention scores. Age also had a positive and significant effect ($b = 0.0291$, $p = 0.0209$), indicating that older participants tended to express stronger intentions. Degree level shows small significance ($b = -0.1461$, $p = 0.0975$), hinting at a potential - though not definitive - trend where higher education might slightly reduce intention scores.

In summary, these findings do not support H1. Although the model as a whole was robust and captured a meaningful portion of variance in intention, the environment manipulation itself did not significantly influence intention. This result suggests that the immediate stress induced by the scenario was not enough, on its own, to meaningfully alter participants' confidence in remembering a future task.

Table 1: *Direct Effect of Environmental Conditions on Intention*

	Dependent variable
	Intention
Environment	0.148
	(0.191)
Gender	0.097
	(0.148)
Age	0.029*
	(0.012)
Occupation	-0.068
	(0.054)
Degree	-0.146
	(0.088)
mood	0.243**
	(0.074)
Constant	2.680***
	(0.561)
Observations	145
R^2	0.162
Adjusted R^2	0.126
Residual Std. Error	0.8255 (df = 138)
F Statistic	4.461* (df = 6; 138)**
Note:	*p<0.1; **p<0.05; ***p<0.01

H2: Reminder Usage as a Mediator

The second hypothesis examined whether reminder usage would mediate the relationship between environment and intention. We anticipated that participants experiencing a stressful environment would anticipate greater difficulty remembering and thus rely more heavily on reminders, which in turn would help maintain or even enhance their intention levels.

As shown in Table 2, when examining the direct relationship between environment (0 = Calm, 1 = Stressful) and intention while including the mediator (reminder usage) and controlling for additional variables (gender, age, occupation, degree, and mood), the overall model remained significant, and several covariates continued to show meaningful associations with intention.

Age (b = 0.0291, p = 0.0209) and mood (b = 0.2430, p = 0.0014) both exhibited positive and statistically significant relationships with intention, indicating that older participants and those experiencing more positive affect reported stronger confidence in remembering their future tasks. Although degree level approached significance (b = -0.1461, p = 0.0975), its effect remained tentative and should be interpreted cautiously. Importantly, environment once again failed to emerge as a significant predictor (b = 0.1478, p = 0.4405), suggesting that even after considering reminder usage and other covariates, simply placing participants in a stressful scenario did not reliably alter their reported levels of intention. In essence, this step of the analysis reinforces the earlier conclusion that environmental stress, as manipulated in this study, was not a key driver of individuals' intentions to remember and complete future tasks. While a direct effect between the independent and dependent variables is not always required for an indirect (mediated) effect to exist (Zhao, Lynch, & Chen, 2010) in this case the environment showed neither a significant direct effect on intention nor a significant effect on the mediator.

Table 2: *Direct Effect of Environment and Reminder Usage on Intention*

	Coefficient	SE	t	p	LLCCI	ULCI
Constant	2.6802***	0.5613	4.7754	0.0000	1.5705	3.7900
environment	0.1478	0.1911	0.7735	0.4405	-0.2300	0.5256
gender	0.0967	0.1483	0.6521	0.5154	- 0.1966	0.3901
age	0.0291	0.0124	2.3374	0.0209	0.0045	0.0537
occupation	-0.0683	0.0540	-1.2655	0.2078	-0.1751	0.0384
degree	-0.1461	0.0876	-1.6685	0.0975	-0.3192	0.0270
Mood	0.2430	0.0746	3.2559	0.0014	0.0954	0.3906

***p < 0.01

Note: LL=lower limit. UL=upper limit. CI=confidence interval.

In line with the non-significant mediation results, the indirect effect of environment on intention through reminder usage was also examined in detail. As shown in Table 3, the estimated indirect effect (Effect size = 0.0061, Boot SE = 0.0248) was not statistically significant, as the 95% confidence interval included zero (LL = -0.0355, UL = 0.0692). Even when considering the partially standardized indirect effect (Effect size = 0.0069, Boot SE = 0.0286), the results remained non-significant (95% CI = [-0.0403, 0.0811]). This suggests that reminder usage did not serve as a meaningful mediator between environmental conditions and intention in this

study. In other words, while the scenario manipulation attempted to highlight differences in stress levels, it did not translate into a reliable increase in reminder use that could, in turn, bolster participants' intention levels. As a consequence, these findings provide no support for H2, implying that reminder usage alone, as measured in this experiment, is insufficient to bridge any gap between a stressful environment and individuals' confidence in carrying out future tasks.

Table 3: *Indirect Effect Environment on Intention Mediated by Reminder Usage*

Reminder	Effect size	Boot SE	LL 95% CI	UL 95% CI
Indirect effect	0.0061	0.0248	-0.0355	0.0692
Partially standardized indirect effect	0.0069	0.0286	-0.0403	0.0811

Note: Bootstrap samples = 10,000. LL=lower limit. UL=upper limit. CI=confidence interval.

These findings fail to support H2. The data do not suggest that individuals in more stressful conditions proactively use reminders to mitigate anticipated intention decay, nor that reminders have a meaningful downstream effect on their reported intention to complete future tasks.

4.5 Additional Diagnostic Checks

To ensure that our results were reliable and not affected by statistical issues, we conducted several diagnostic and robustness checks. First, we examined the distribution of the model's residuals using the Shapiro-Wilk test, which indicated that the residuals did not significantly deviate from normality ($W = 0.99061$, $p = 0.446$). We also ran the Breusch-Pagan test to check for uneven variance in the residuals, and the result was not significant ($p = 0.2823$), suggesting that our model did not have problems with heteroscedasticity. Additionally, we assessed multicollinearity by calculating Variance Inflation Factors (VIF), all of which were close to 1, indicating no worrisome correlations among our predictor variables. Beyond these initial checks, we tested the stability of our findings through several robustness analyses. For example, we applied bootstrap estimations (1,000 replications), and the pattern of results remained consistent. We also tried log-transforming the intention variable, and again the findings stayed the same. Finally, we introduced an interaction term (environment × mood_combined) to see if mood influenced the effect of the environment on intention. This interaction was not significant, meaning it did not change our primary conclusions.

In summary, these diagnostic and robustness checks support the stability of our results. The absence of major assumption violations and the consistency of findings across multiple approaches increase our confidence in the conclusions drawn from the data.

4.6 Summary of Results

In summary, the results from this study did not support the initial hypotheses. Although participants were presented with either a calm or a stressful environment, we found no direct evidence that stress alone weakened their intentions to complete a future task. Nor did we find that stressful conditions encouraged individuals to rely more on reminders as a way to maintain their intention. Instead, factors such as mood and age emerged as more influential predictors of intention. These findings invite us to reconsider the complexity of how environmental conditions interact with internal processes like mood, cognitive capacity, and memory strategies, adding nuance to our understanding of the intention-behavior gap and the role of cognitive offloading tools like reminders.

5 Discussion

5.1 Theoretical Contribution

This study set out to examine whether individuals exposed to a stressful environment would lead to a greater intention decay over time than those in a calm environment, and whether these differences would be mediated by the use of reminders. Drawing on the Theory of Planned Behavior (TPB) (Ajzen, 1985), Implementation Intentions Theory (Gollwitzer & Brandstätter, 1997), and research on Prospective Memory (Meacham & Singer, 1977; McDaniel & Einstein, 2007), the goal was to investigate how external contexts and cognitive strategies interact with internal states to influence the formation and maintenance of intentions. Contrary to expectations, the environmental manipulation did not significantly influence intention. Although participants in the calm condition reported slightly higher mean intention scores ($M \approx 4.25$, $SD = 0.93$) than those in the stressful condition ($M \approx 3.96$, $SD = 0.82$), this difference was not statistically significant after controlling for mood and demographic factors. Regression analyses, including environment and covariates (gender, age, occupation, education, and mood), found no significant direct effect of environment on intention ($b = 0.1478$, $p = 0.4405$).

According to TPB, external factors could shape perceived behavioral control or indirectly influence attitudes or subjective norms, yet our results suggest that simply asking participants to think about a specific stressor or a calming thought may not be enough to alter intention strength. These results suggest that conditions more similar to everyday life and lasting longer than a brief scenario might be necessary to create meaningful changes in intentions. It also suggests that the research design could be revisited. Instead of relying solely on a between-subjects, scenario-based approach, it might be beneficial to conduct a laboratory experiment where the environment can be more carefully controlled and manipulated over time. Another option is to use a combination of experimental methods and real-life observations, such as pairing laboratory manipulations with field data on actual behavior, to provide a fuller picture of how environmental conditions interact with memory and intention formation.

From the perspective of Implementation Intentions, we might have expected that being in a stressful environment would encourage participants to set up clear "if-then" plans, helping them decide in advance how to handle challenges and follow through on a future task. However, our results showed that simply experiencing a brief stressful scenario did not lead participants to rely more on these plans or make their intentions stronger. In other words, they did not naturally turn the stressful cues into triggers for action. This suggests that just a short-lived stressful condition isn't enough to activate if-then planning on its own - participants might need more explicit guidance, more meaningful personal reasons, or a setup that feels more genuinely connected to their everyday lives in order to use these strategies effectively.

Prospective Memory research and studies on memory decay under cognitive load (e.g., Barrouillet et al., 2004; Fernandes, 2024) generally suggest that genuinely stressful conditions should strain individuals' cognitive resources, causing intentions to fade more quickly. Based on this reasoning, we expected that participants in a stressful scenario would sense potential memory problems and therefore lean more on reminders to support their future follow-through. However, our mediation analysis (using Hayes' [2013] PROCESS macro) did not completely support this idea. The environment had no significant impact on reminder usage ($b = 0.0934$, $p = 0.6527$), and reminder usage did not significantly influence intention ($b = 0.0648$, $p = 0.4113$). Since the 95% confidence interval of the indirect effect included zero, it appears that participants did not view the stressful scenario as serious enough to justify using more reminders, nor did the presence of reminders boost their intention levels. Instead, the strongest predictors of intention were mood and age. Participants who felt more positive ($b = 0.2430$, p

= 0.0014) and older participants (b = 0.0291, p = 0.0209) reported higher intention scores. This pattern suggests that stable internal factors and personal life experience play a more influential role than a brief scenario-based stressor. Age may correspond to better self-regulation, familiarity with memory techniques, or simply having more time to recall tasks, while mood may reflect overall emotional stability and the mental energy needed to stay committed to future tasks.

Putting it all together, these results offer a more nuanced view of how the environment, reminders, and personal characteristics work together. Although our initial theories suggested that environmental stressors and reminder use would clearly shape intention formation and follow-through, what we found is more complicated. A brief exposure to a stressful or calm scenario did not cause the predicted drop in intentions or a greater reliance on reminders. Instead, factors like mood and age stood out as stronger influences. This points to the need for updating our theoretical frameworks. Rather than assuming that environmental cues and reminders will always matter, we should consider the specific conditions and individual differences under which these factors genuinely make a difference in bridging the gap between what people intend to do and what they actually accomplish.

5.2 Practical and Managerial Implications

Although the initial hypotheses were not supported, the results still provide valuable guidance for those looking to strengthen intention follow-through in everyday situations. While the environmental manipulation did not produce the expected drop in intention, our findings emphasize the influence of personal factors like mood and age. This suggests that efforts to enhance overall well-being, such as encouraging more positive emotional states, may be more effective at sustaining task-related intentions than trying to induce or reduce stress through controlled environmental changes. From a managerial perspective, rather than focusing solely on reshaping the external environment to reduce stress, organizations might benefit from strategies that help individuals manage their emotional responses. Offering stress-management workshops, flexible scheduling, or opportunities for brief restorative breaks during the workday could foster a more positive mood, potentially enhancing employees' confidence in remembering and completing future tasks. Additionally, the limited impact of reminders in this study suggests that simply providing these tools, without considering people's underlying motivation or emotional state, might not significantly improve follow-through. Developers and

managers could consider integrating mood-tracking features, personalized prompts, or adaptive reminder systems that adjust to an individual's daily emotional and cognitive conditions. Aligning reminder usage with users' internal states may increase their overall effectiveness.

Ultimately, while environmental factors alone did not drive significant changes in intention, these findings underscore the need for more holistic approaches. Managers and product developers should look beyond environmental triggers and consider interventions that address internal states, tailor reminder usage to individual needs, and support positive emotional well-being. This broader perspective could prove more fruitful in enhancing long-term adherence to intended behaviors.

5.3 Limitations and Future Outlook

Several limitations help explain why the hypothesized effects did not emerge and point the way for future research. First, the study measured intention rather than actual behavior. Although intention is a key predictor of action according to TPB and related frameworks, it may not always translate into real-life follow-through, especially when participants do not face tangible consequences for forgetting. Future research should consider longitudinal or field-based designs that measure whether participants actually follow through on their tasks, rather than relying solely on self-reported intention. Second, the environmental manipulation was likely too minimalistic and artificial to simulate real-world stress. Prior research shows that chronic stress or more immersive and emotionally resonant conditions have stronger impacts on cognition (McEwen & Sapolsky, 1995; Sapolsky et al., 2000). Future studies could employ more realistic scenarios that expose participants to ongoing challenges, thereby placing greater demands on their cognitive resources and more closely resembling everyday life. Third, this study measured reminder usage only through self-reports of intended use, not through direct observation of participants actually setting reminders. Participants could have overestimated their likelihood of using reminders or overlooked how changing external conditions might affect their willingness to rely on such aids. Future work should track actual reminder usage, perhaps by integrating smartphone-based reminder apps and monitoring participants' behavior over time. Finally, the results point toward other moderators and mediators – such as differences in working memory capacity, past experiences with memory failures, or how personally meaningful the tasks are – which may play a more critical role. Future studies can expand the

models tested here to incorporate these factors, potentially revealing more complex interplay among environment, internal states, and cognitive offloading strategies.

In sum, although this study did not empirically support the predicted link between environment and intention or the role of reminders as a mediator, it does contribute valuable insights. By emphasizing the importance of mood and age over brief environmental manipulations, it encourages future research to pay closer attention to internal factors and more realistic contexts. Such an approach may offer a clearer understanding of how environmental conditions, memory processes, and motivation combine to influence whether people turn their intentions into real-world actions.

6 Conclusion

The research aimed to examine whether stressful or calm environments would influence how strongly people hold onto their intentions, and whether these environmental conditions affect how individuals use reminders to compensate for potential memory failures. Contrary to the initial hypotheses that a stressful scenario would undermine intention levels and encourage heavier reliance on reminders, the data showed no clear effect of environment alone on either intention decay or increased reminder usage. Instead, two personal factors, mood and age, emerged as more strongly associated with reported intention levels. Participants who felt more positive or who were older generally had higher intention scores, regardless of whether they had imagined a stressful or calm scenario.

One likely reason is that the study's scenario-based manipulation (asking people to reflect on a stressful issue or a calm setting) may not have been sufficiently immersive or extended to generate lasting emotional effects. While some participants might have genuinely felt stressed or calm for a longer period of time, others might have experienced only a brief reaction. Consequently, the hypothesized impact of environment on intention strength did not emerge in the data.

Although these outcomes do not confirm the proposed hypotheses, they bring useful insights to light. First, even if environmental framing in a brief exercise has minimal impact, personal factors such as mood and age appear consistently tied to how confident people are in their memory for future tasks. Second, managers, team leaders, or anyone seeking to help individuals

maintain their intentions might consider focusing more on supporting people's emotional well-being and understanding the role of life stage or experience. Future work could still investigate environmental influences by using more comprehensive or realistic methods (e.g., field studies, ecological momentary assessments, or virtual reality settings) where stressful or calming conditions are experienced in a deeper, more sustained way. Ultimately, these findings underscore how personal attributes play a pivotal role in whether intentions are carried through. By taking into account individuals' emotional state and life experience, interventions and tools can be created to better support people in successfully following through on their intended goals.

7 Appendix

Appendix 1: Survey Questionnaire

Block: Introduction

The research is being conducted as part of a Master's thesis project. The purpose of this study is to explore how different environments affect memory decay and task completion. The survey will take approximately 3-4 minutes to complete. All responses are completely anonymous and will only be used for research purposes. There are no right or wrong answers, so we encourage you to respond honestly. Thank you for your time! :-)

Block: Scenario Presentation

Scenario 1: Please think about an environment or scenario that gives you the most peaceful feeling (e.g., walk in the park, day at the beach, reading a book, listening to music etc.).
Q1: How calm do you feel when you think about this?

Scenario 2: Please think about a major global issue that is most stressful for you (e.g., climate change, inflation, war, pandemics etc.).
Q1: How stressed do you feel when you think about this?

Block: Context Effect and Scenario Based Questions

Scenario 1:
Q1: What specific feelings come to your mind when you think about this calm scenario?
Q2: How would you rate your current mood after considering the calm environment?

Scenario 2:
Q1: Please describe briefly how this global issue affects your day-to-day life.
Q2: How would you rate your current mood after considering the stressful environment?

Block: Task Intention Formation and Memory Confidence

Scenario 1: As you answer the following questions, please continue to think about the calm environment you considered earlier.
Q1: What is one task you need to complete in the next 24 hours?
Q2: How confident are you that you will remember to complete this task without setting a reminder?

Scenario 2: As you answer the following questions, please continue to think about the stressful environment you considered earlier.
Q1: What is one task you need to complete in the next 24 hours?
Q2: How confident are you that you will remember to complete this task without setting a reminder?

Block: Attention Question

Q1: To make sure you're paying attention select "A lot" for this statement

---

Block: Memory Decay and Impact of each Environment

Scenario 1:
Q1: How much mental effort do you think it will take to remember this task without any help?
Q2: Do you feel that the current environment is affecting your ability to remember the task you formed during this survey?
Q3: After thinking about your current situation, how confident are you now that you will remember to complete the task?

Scenario 2:
Q1: How much mental effort do you think it will take to remember this task without any help?
Q2: Do you feel that the current environment is affecting your ability to remember the task you formed during this survey?
Q3: After thinking about your current situation, how confident are you now that you will remember to complete the task?

Block: Reminder Use

Q1: Do you think you will set a reminder to help you remember this task?
Q2: How important do you think setting a reminder will be to ensure you don't forget this task?
Q3: If you plan to set a reminder, what type will you use?

Block: Demographics

Q1: What is your age?
Q2: What is your gender?
Q3: What is your current occupation?
Q4: What is your nationality?
Q5: What is your highest level of education?

Appendix 2: R-Code H1 and H2

```
############################################################
########## NORMAL REGRESSION (H1) ##########################
############################################################
#normal Regression environment-reminder.
H1 <- lm(intention ~ environment + dgender + age + occupation_num + degree_num + mood_combined, data = data_1)
summary(H1)

# Export Table
stargazer(H1, type = "html", out = "regression_results_h1.html")
```

```r
#######################################################
############### Robustness Checks #####################
#######################################################
# Bootstrap Estimation
library(boot)
# Define bootstrapping function
boot_model <- function(data, indices) {
  lm_model <- lm(intention ~ environment + reminder, data = data[indices, ])
  return(coef(lm_model))
}
boot_results <- boot(data_1, boot_model, R = 1000)
summary(boot_results)

# Sensitivity Analysis
influencePlot(H1)  # Visualize influential points

# Try to improve model H1
# Log-transforming the dependent variable
H1_log <- lm(log(intention) ~ environment + dgender + age + occupation_num + degree_num + mood_combined, data = data_1)
summary(H1_log)

# Add interaction between environment and mood_combined
H1_interaction2 <- lm(intention ~ environment * mood_combined + dgender + occupation_num + degree_num + mood_combined, data = data_1)
summary(H1_interaction2)
```

```r
#####################################################################
########## PROCESS MACRO (H2) ##########################
#####################################################################
#Process macro Hayes Model 4 (H2)
#process Model 4 with covariates
process(data = data_1, y = "intention", x = "environment", m = "reminder", model = 4,
        effsize = 1, total = 1, stand = 1,
        cov = c("dgender", "age", "occupation_num", "degree_num", "mood_combined"),
        boot = 10000, modelbt = 1, seed = 42)

sink("process_results_model4.txt")

process(data = data_1, y = "intention", x = "environment", m = "reminder", model = 4,
        effsize = 1, total = 1, stand = 1,
        cov = c("dgender", "age", "occupation_num", "degree_num"),
        boot = 10000, modelbt = 1, seed = 42)
sink()
```

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