UiT The Arctic University of Norway

Department of Psychology, Faculty of Health Sciences

The Use of Situational Cues when Thinking About Future Action

The Relevance of Visual Imagery and Relationship With Conscientiousness

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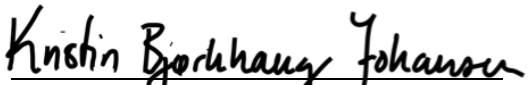
Master's thesis in Psychology, PSY-3900, May 2024

Preface

When applying for the master's program, my biggest concern was that I would not be able to do the research required or write a thesis of this size. However, with all the support I have gotten during these two years, I can happily say that they have been the most enjoyable years of my academic journey, so far.

I want to give a huge thanks to my supervisor Torsten Martiny-Huenger. Thank you for letting me explore and find my path within this field of research. I greatly appreciate your careful guidance and your genuine interest in this research.Further, I would like to thank my peers for a great two years. It has been important to have someone who goes through the same journey as oneself; someone to spar with, to complain to, or just to have a good laugh with. I am looking forward to following your journeys in the years to come.

Lastly, I would like to thank the three most important people in my life. To my partner Otto, thank you for providing me with a stable, safe, and loving environment to come home to every day throughout this process. To my mom and dad, thank you for giving me the means and tools to be able to stick to my plans and never give up when I set my mind to something. You have always told me that doing my best is good enough and that Is something I live by every day.



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Sammendrag

Tidligere forskning har funnet et forhold mellom inkludering av situasjonelle stimuli i tanker om fremtidige handlinger (situational cue-thought planning), selvregulerings-suksess, og personlighetstrekket planmessighet. Denne forskningen hadde som mål å replisere tidligere korrelasjonsfunn fra Martiny-Huenger et al., (2022), samt å presentere et nytt aspekt som kan påvirke effektiviteten av situational cue-thought planning, nemlig detaljer i visuell forestillingsevne. Studie én ($N = 96$) fant en signifikant Pearsons korrelasjon mellom situational cue-thought planning og planmessighet, mens det ble sett en trend for forholdet mellom situational cue-thought planning og detaljert visuell forestillingsevne. Studie to ($N = 114$) fant lignende korrelasjoner. I tillegg fant studie to en modereringseffekt av detaljert visuell forestillingsevne på forholdet mellom situational cue-thought planning og selvregulerings-suksess (i form av måloppnåelse). Denne modereringseffekten var til stede for personer med lav forpliktelse til målet, men ikke for personer med høy forpliktelse. Forskningen støtter dermed tidligere påstander om at situational cue-thought planning kan være en selvregulerende strategi som gjør planmessige mennesker bedre planleggere. I tillegg fremhever denne forskningen hvordan individuelle forskjeller slik som detaljert visuell forestillingsevne kan påvirke effektiviteten av situational cue-thought planning og dermed selvregulerings-suksess.

Nøkkelord: situational cue-thought planning, selvregulering, mental visualisering, planmessighet

Abstract

Previous research has found a relationship between the habitual inclusion of situational cues in thoughts about future action, self-regulation success, and the personality trait conscientiousness. The present research aimed to replicate previous correlational findings from Martiny-Huenger et al., (2022) as well as presenting a new aspect that might influence the effectiveness of situational cue-thought planning, namely vividness of visual imagery in episodic foresight. Study one (N = 96) found a significant Pearson's correlation between situational cue-thought planning and conscientiousness, while a trend was seen for the relationship between cue-thought and vividness of visual imagery. Study two (N = 114) found similar relationships. Additionally, study two found a moderation effect of vividness of visual imagery on the relationship between situational cue-thought planning and self-regulation success in the form of goal achievement. This moderation effect was present for people with low commitment to the goal but not for people with high commitment to the goal. Thus, this research further supports the notion that situational cue-thought planning might be a self-regulatory strategy that makes conscientious people better planners. In addition, this research highlights how individual differences such as vividness of visual imagery can influence the effectiveness of situational cue-thought planning and self-regulatory success.

Keywords: situational cue-thought planning, self-regulation, visual imagery, conscientiousness

The Use of Situational Cues When Thinking About Future Action:

The Effect of Visual Imagery and Relationship With Conscientiousness

The majority of our human lives consists of having goals and creating plans to reach them. Every day, we have an agenda or a goal of what we want to do. Whether it is going to work, buying Christmas presents at the mall, or deciding on what career path to take. Our goals for the future and our plans on how to reach them are what drive our lives forward in many regards. Without plans and goals, many would say that we have nothing to live for.

However, sometimes things do not go to plan, or we fail to reach our goals. If we plan to go to the mall but fail to do so, what causes this? Does the problem lie in the way we plan, how motivated we are to reach our goal, or does it have something to do with who we are as a person? Our personality traits have been proven to be connected to factors such as level of education, health behavior, and longevity (Conner et al., 2007; Kern & Friedman, 2008) as well as many other aspects of our lives. Specifically, people who score high on the personality trait conscientiousness are considered to be good planners (Prenda & Lachman, 2001), and therefore, also have high self-regulation success (i.e. acting in line with one's beliefs and goals; Baumeister & Heatherton, 1996). This raises the question of what makes conscientious people better planners and thus, have better self-regulatory success.

A planning strategy that has been found to have a relationship with both self-regulatory success and the personality trait conscientiousness- is called situational cue-thought planning. This type of planning involves specifying a situation where you want the desired behavior to be executed. The present research aims to replicate the previous findings on the relationship between situational cue-thought planning as a self-regulatory strategy and conscientiousness. Additionally, I propose an individual difference that may influence the effectiveness of this planning strategy, namely to what degree one is able to visualize detailed images in one's mind. Moving forward, I will introduce the concept of *if-then* planning, as it

provides a basis for how situational cue-thought planning works as an effective planning strategy. Further, I will introduce the relationship between conscientiousness and situational cue-thought planning. Lastly, I will argue why the level of visual detail in episodic foresight might influence the effectiveness of situational cue-thought planning as a self-regulatory strategy.

The Intention-Behavior Gap and If-Then Planning

As many of us have experienced, the path to reaching one's goals is not always smooth sailing. Many people fail to follow through on their plans and goals despite having a strong intention to do so. If merely goal setting was enough to elicit the wanted behavior, then we would all fulfill our greatest dreams. Following this issue, when it comes to goal achievement, there is often talked about an intention-behavior gap (Bieleke et al., 2021). This refers to the fact that the amount of intention one has to do something, does not necessarily reflect change in behavior (Sheeran & Webb, 2016).

To investigate this gap and explain the process that turns intention into behavior, Gollwitzer (1993) found it necessary to differentiate between "goal intention" and "implementation intention". Goal intention refers to merely having an intention to reach a goal, for example, "I want to lose weight". Implementation intentions, however, also specify how and when to reach this goal. An example of this can be "If I am standing in front of the elevator, then I will take the stairs instead" (to facilitate physical activity).

Implementation intentions, also referred to as *if-then* planning is a strategy that has been proven to be successful when it comes to goal achievement (Bieleke et al., 2021). This is because this way of planning specifies a critical situation in which the desired behavior must take place. The situation specified in the *if-then* plan will then act as a cue when encountered and lead to more automized initiation of the wanted behavior (Gollwitzer & Sheeran, 2006). This beneficial effect of implementation intention has been linked to two cognitive

mechanisms, namely "cognitive accessibility" (Bieleke et al., 2021; Parks-Stamm et al., 2007) and the principles of stimulus-response learning (Bayer et al., 2009; Martiny-Huenger et al., 2022).

Cognitive Accessibility

The mechanism of cognitive accessibility refers to the identification of a specific cue (situation) in which one wants the behavior to be executed. Research on the mechanisms of implementation intentions has found that by specifying a situational cue in implementation intentions, this cue firstly becomes a mental representation that lies readily in your mind and, thus, draws your attention when encountered in the environment (Parks-Stamm et al., 2007). In other words, the situational cue will catch your attention quite easily when you find yourself in that situation. Further, the specified cue then becomes a triggering factor for the planned behavior (Aarts et al., 1999). In addition, research has found that specifying a situational cue draws attention away from other cues, thus, helping you ignore irrelevant cues and thereby aiding in the achievement of the intended behavior (Parks-Stamm et al., 2007)

Stimulus-Response Link

The principle of stimulus-response learning is that repetitive association between a stimulus and a response will create some form of learning (Svartdal, 2016). An example of this type of learning in everyday life is when you get a notification on your phone, and you immediately go to check it without thinking about it. You have *learned* that the notification sound is associated with the behavior of checking your phone and you don't have to consciously think about executing the behavior.

In the case of if-then planning, the stimulus-response link refers to the fact that pairing a situation with an action (e.g. standing in front of the elevator, with taking the stairs) by either repeating it verbally or making a mental picture of it, will form an associative learning link between the cue (situation; elevator) and the response (action; taking the stairs) (Bayer et

al., 2009). Here, one does not learn the association by *doing* (like the example above), but by *thinking* about the situational cue (stimuli) and the behavior (response) together. The result of this link is that the action comes to mind and is more likely to be done - some even say that it may be executed automatically (Bayer et al., 2009). By using the if-then planning strategy, one also does not have to actively think about the goal all the time. Holding information in the working memory (short-term memory) is taxing and has limited capacity, therefore delegating control to a stimulus that is to be encountered later in time can be more effective (Martiny-Huenger et al., 2017).

In light of these two mechanisms, implementation intentions are effective because the specified situational cue lies more readily in the attention, and the link that is created between the cue and the behavior triggers the execution of the intended behavior.

Spontaneous Inclusion of Situational Cues

When the effect of implementation intentions is studied, the participants are often prompted to create a specific implementation plan for a given scenario (Bieleke et al., 2021). However, with the knowledge in mind that some people are simply better at reaching their goals than others, the question of whether some people create implementation intentions spontaneously when planning, arises.

Martiny-Huenger et al. (2022) investigated whether some people spontaneously or habitually used an *implementation intentions way of planning*. Specifically, if they included situational cues when planning a future action. To investigate this, they created a "Cue-Thought Habit Questionnaire" based on an established mental habits questionnaire from Verplanken and Orbell (2003). This questionnaire aimed to assess whether people tended to include situational cues when planning (e.g. "If I am standing in front of the elevator [situational cue], then I will take the stairs"), or if they merely had goal intentions (e.g. I want

to lose weight"). In addition, they sought to find out if the use of situational cues when planning would relate to better everyday self-regulatory success.

Indeed, Martiny-Huenger et al. (2022) found that people who had a tendency to use situational cue-thoughts when planning also reported greater levels of everyday self-reported self-regulatory success. Kristiansen et al. (2023) followed up on this, but as well as replicating the findings from Martiny-Huenger et al. (2022), they also included a study where they measured actual self-regulatory success by asking participants to complete a task at a certain point of time in the future. They found a positive relationship between the habitual use of situational cue-thought and actual self-regulatory success on the task. In other words, where Martiny-Huenger et al. (2022) found that people who habitually used situational cue-thought planning reported better self-regulatory success, Kristiansen et al. (2023) also found this relationship with actual self-regulatory success.

The Role of Conscientiousness

In addition to the findings mentioned above, Martiny-Huenger et al. (2022) did an exploratory analysis including The Big Five personality traits and found that people who had a higher tendency to use situational cue-thoughts also scored higher on the personality trait conscientiousness. Specifically, they found that the use of situational cues acted as a mediator between conscientiousness and self-regulatory success. As Martiny-Huenger et al. (2022) suggested, the inclusion of situational cues when planning future action can be considered a more thorough way of planning. This is something that often is characterized by people who score high in conscientiousness. For example, the personality trait conscientiousness is often linked to positive health behaviors, better success in life, and overall good self-regulation (Conner et al., 2007). They also execute behaviors such as using a planner and being on time for appointments (Jackson et al., 2010). Interestingly, some research has also found that conscientious people more often act according to their intentions (Bieleke et al., 2021) and

benefit less from instructions of if-then planning (Webb & Sheeran, 2007). This has raised the question if conscientious people tend to plan in an *if-then* format spontaneously, and therefore do not have great improvements in their planning when prompted to use implementation intentions. Thus, Martiny-Huenger et al. (2022) suggested that the use of situational cues when planning might be another characteristic behavior of conscientious people.

Visual Detail in Episodic Foresight

As mentioned previously, it is well-established that conscientious people are good planners. A study by (Prenda & Lachman, 2001) sought to investigate this notion further by finding out why that might be. Their results suggested that conscientious people tended to be more future-oriented, meaning that they were more likely to think ahead in time, therefore being more inclined to make thorough plans about the future. The assumption that conscientious people are more future-oriented than many other personality traits is interesting regarding situational cue-thought planning. This is because to be able to create situational cues, one arguably must be able to think ahead of time and consciously be focused on future possible scenarios.

As stated above, some research has shown that individual differences such as personality can affect the way we plan, and more specifically, may influence the tendency to habitually use situational cues when planning (Kristiansen et al., 2023; Martiny-Huenger et al., 2022). However, the use of situational cue-thought is arguably a complex mechanism that may be influenced by several factors. A concept closely linked to personal goal-achievement and flexible planning is episodic foresight (Hudson et al., 2011). Episodic foresight can be defined as “the ability to project oneself into the future and mentally simulate situations and outcomes” (Hudson et al., 2011). Both episodic foresight and episodic memory have been suggested to rely on the same mechanisms in the brain and therefore hold many of the same properties (D’Argembeau & Van der Linden, 2006). For example, episodic foresight ability

typically emerges at the age of 4, at the same time as episodic memory emerges (Hudson et al., 2011). Even though episodic foresight is an ability most people hold, there have been found indications that there are differences when it comes to *visual detail* in episodic foresight (D'Argembeau & Van der Linden, 2006).

D'Argembeau and Van der Linden (2006) argues that visual imagery plays an important role in episodic memory, and therefore also in episodic foresight. They found that people who had a higher level of visual detail could incorporate more contextual information and details when imagining future scenarios. Traditionally, if-then planning in an experimental setting does not specifically require mental imagery, but rather bases upon verbal statements of the if-then plan (Knäuper et al., 2009). However, in everyday life, one does not always rely on reciting every plan out loud, but merely *thinks* of what one plans to do. Therefore, the strength of the stimulus-response link that is created in situational-cue thought planning might often rely on our mental representations and visual imagery of the situational cue.

Moreover, the richness of mental imagery has been found to strengthen the effect of implementation intention and further- goal achievement (Knäuper et al., 2009). This is because mental imagery is not constricted to only visual sensory information but can incorporate multiple sensory modalities such as sound, smell, and tactile information (Lang, 1979). In other words, the richer the mental imagery- the more precise and vivid the mental representations of the stimulus and action becomes (Knäuper et al., 2009). If we assume that the spontaneous inclusion of situational cues when planning is based upon the same principles as if-then planning/implementation intentions are when prompted, then we can also assume that having detailed or rich mental imagery will enhance the ability to spontaneously include situational cue-thoughts when planning future action.

Further, research on Congenital Aphantasia- the lack of ability to generate visual imagery, has shown that some individuals lack the overall ability to create "voluntary mental images" (Blomkvist, 2023). Aphanasics have also been found to have significantly poorer recollection of details in episodic memory. Furthermore, they also have great difficulty imagining future possible scenarios (Blomkvist, 2023). In other words, there is some evidence that people can have varying abilities to produce detailed mental imagery.

Thus, it is possible that the effectiveness of situational cue-though planning as an effective self-regulatory strategy is dependent upon the level of visual detail in episodic foresight. For example: to be able to specify an appropriate situational cue to reach your goal, you have to be able to mentally project yourself into the future and simulate possible scenarios you might find yourself in. In addition, the level of detail when specifying a situation can be crucial for implementing the wanted behavior at the critical time-point. For example: if you are not able to vividly incorporate details about a certain situation, the cue might be weaker, or you might not perceive the cue when you encounter it. With regard to the effect of mental imagery on implementation intentions, being able to vividly imagine the cue (situation), this link will be stronger, and the cue-thought planning will be more effective. Therefore, people who are not able to vividly imagine possible future cues will arguably benefit less from planning this way.

Lastly, if you lack specific details about a possible future situation, you might find yourself in a situation where you encounter the situational cue without it being the appropriate time to execute the behavior. The level of detail in episodic foresight or episodic foresight ability can therefore make situational cue-thought planning an effective or ineffective self-regulatory behavior depending on the level of visual detail. Further, if one does not have vivid visual detail when imagining future scenarios, for example some degree of Aphantasia, it may be hard (or impossible) to envision situational cues in the first place.

The Present Research

Based on the research and concepts explained, the present research aims to answer the following questions: 1. Is there a relationship between situational cue-thought planning, vividness of visual imagery, and conscientiousness? 2. Does vividness of visual imagery influence the effectiveness of situational cue-thought as a self-regulatory strategy? I therefore conducted two separate studies to investigate the relationship between cue-thought planning success, vividness of visual imagery, and conscientiousness.

Study 1: The Relationship between Cue-Thought, Vividness, and Conscientiousness

The first study aimed to replicate the findings from Martiny-Huenger et al. (2022) as well as adding the aspect of visual imagery in episodic foresight, thus, answering question 1. The study was a self-report questionnaire with three measures: The ‘’Cue-thought habit questionnaire’’ (Martiny-Huenger et al., 2022) measured the tendency to include situational cues in thought about future action; the Mini-IPIP conscientiousness subscale (Donnellan et al., 2006), measured the level of conscientiousness; and the “Vividness of Visual Imagery Questionnaire’’ (Marks, 1973) measured the level of detail in episodic foresight.

Study one included three pre-registered hypotheses: H1: If the use of situational cues when planning is a characteristic of conscientiousness, then people who score high on conscientiousness will tend to use situational cues more when planning (replication of Martiny-Huenger et al., 2022). H2: If the use of situational cues requires high vividness of visual imagery to identify a suitable cue, then people who often use situational cues when planning will score higher on vividness of visual imagery questionnaire. This hypothesis is based on the notion that the identification of a situational cue in situational cue-thought planning might also be related to the ability to vividly imagine possible future scenarios. More specifically, the ability to effectively *specify* a situational cue is arguably dependent on the ability to imagine possible future scenarios you might find yourself in, at the timepoint

when you want your desired behavior to be executed. Thus, I argue that the ability to envision future situational cues when planning is somewhat related level of detail in episodic foresight.
H3: If the use of situational cues when thinking about future action is linked to high vividness of visual imagery, then people who score high on conscientiousness will also have greater vividness of visual imagery. This hypothesis is based on evidence that conscientious people generally are good planners, and therefore possess some sort of self-regulatory behavior/mechanism that benefits their planning skills, which may be related to having high vividness of visual imagery in episodic foresight.

With measuring quite abstract concepts such as vividness of visual imagery, there is a potential to measure other similar concepts. In this study, I focused on measuring a type of visualization that is productive and fosters efficiency. However, the act of *imagining* may be closely related to another concept such as daydreaming. Therefore, to ensure that the vividness of visual imagery questionnaire does indeed measure what I want, and not something else, I also included a measurement of daydreaming. The "Daydreaming Frequency Scale" (Stawarczyk et al., 2012) was therefore included as a control variable in this study. The act of daydreaming can be seen as a behavior contradictory to the conscientiousness trait, as it does not foster efficient and goal-oriented behavior. Rather, daydreaming is related to inefficiency and awareness of the present moment (Stawarczyk et al., 2012). In sum, study one aims to find out if there is a relationship between the variables situational cue-though planning, vividness of visual imagery, and conscientiousness while controlling for daydreaming.

Method

Ethics

The ethical approval for this study was granted by The Institute of Psychology at UiT The Arctic University of Norway (Reference code: 17/23/R1). The project and hypotheses were at Open Science Framework (https://osf.io/d3uqv).

Participants and Design

The study was based on a correlational design. A power analysis was run with G*Power, based on the relationship between conscientiousness and cue-thought habit from Martiny-Huenger et al. (2022). Eighty-four participants were required to obtain .80 power, to detect a medium effect size of .30 at the standard .05 alpha error probability. In total, one hundred participants were recruited to account for exclusion criteria.

Participants were recruited via e-mail and social networks. An e-mail was sent to students at UiT via an email list of all the students listed in different faculties. Participants accessed the questionnaire via a link that was distributed in this e-mail. Participation was voluntary and anonymous. Anonymity was secured by not asking any demographical questions besides age and gender. In addition, all email addresses were stored separately from the survey data, so they could not be connected. All participants had to consent to participate before they were allowed to start the survey (see Appendix A for full information text and consent form).

Consent was given by checking the following boxes: “I consent to participating in this study”, “I have read the information above and understand the purpose of this study. I understand my right to withdraw.”, “I am 18 years old or older.”. As an incentive, participants could choose to be part of a lottery to win one of two gift cards of 500,- NOK. Instructions to participate in this lottery was given at the end of the study, and the e-mails was saved in a different location to the answers, so that the answers could not be traced back to their e-mail.

Materials

The survey consisted of four different self-report measures: The Cue-Thought Habit Questionnaire (Kristiansen et al., 2023; Martiny-Huenger et al., 2022), the Mini-IPIP Conscientiousness subscale (Donnellan et al., 2006), the Vividness of Visual Image Questionnaire (Marks, 1973), and the Daydreaming Frequency Scale (Stawarczyk et al., 2012). The Cue-Thought Habit Questionnaire and the Mini-IPIP Conscientiousness subscale was already translated to Norwegian and used in Kristiansen et al. (2023). The remaining questionnaires was translated to Norwegian by the author.

Cue-Thought Habit Questionnaire. Firstly, the questionnaire created by Martiny-Huenger et al., (2022) "Cue-Thought Habit Questionnaire" was used to measure how likely participants were to include situational cues when thinking about a future action. Participant were given information about the concept of situational cues and instructions on how to evaluate their thinking about future actions and prepare for the questionnaire. An example of such an instruction was: "As you go about your daily routines, you suddenly remember that you need to buy a birthday present for a friend. What sounds more like your first thought?" Answer options: "I need to remember to buy a present (Focus on action)", or "When I am at the mall this evening, I am going to buy a present (Focus on situation)" See Appendix C for a full list of items.

The questionnaire itself asks participants to rate their answers on a 7-point likert scale that ranges from "totally disagree" to "totally agree". Here, half of the questions are reversed, as suggested by Kristiansen et al. (2023). Examples of items: "When thinking about future actions, thinking about specific situations where I can do that action is something I rarely do", or "When thinking about future actions, thinking about specific situations where I can do that action is something I do every day".

Mini-IPIP Conscientiousness Subscale. The second measure was the level of conscientiousness. Here, I used the well-established Mini-IPIP conscientiousness subscale

that contains four items (Donnellan et al., 2006). Answers are also rated on a 7- point likert scale ranging from “totally disagree” to “totally agree”. An example of an item: “I get chores done right away”. See Appendix D for the full list of items.

Vividness of Visual Imagery Questionnaire (VVIQ). The third measure was the level of detail in episodic foresight. I used the Vividness of Visual Imagery Questionnaire (VVIQ) by Marks (1973). This questionnaire originally requires participants to rate their ability to visualize varying scenarios such as “The sun is rising above the horizon into a hazy sky” on a multiple-choice-single response scale. This scale ranges from “1. Perfectly clear and vivid as normal vision”, “2. Clear and reasonably vivid”, “3. Moderately clear and vivid”, “4. Moderately clear and vivid” or “5. No image at all, you only ‘know’ that you are thinking of the object”. See Appendix E for the full list of items.

In this survey, I chose to change the response scale from multiple-choice to a 7-point likert scale (anchor style) ranging from option one “Perfectly clear and vivid” vision to option seven “No image at all”. I justify this change with the arguments that, firstly, having different scales throughout the survey can be confusing for the participants. Secondly, the interpretation of multiple-choice responses arguably leans more towards a qualitative, rather than a quantitative analysis. This is because one cannot justify that the “distance” between “Perfectly clear and vivid, as normal vision” and “Clear and reasonably vivid” equals the “distance” between 1 and 2 on a likert scale. I therefore found it more reasonable to change the scale to a numerical likert scale with the two polar options at each end. Example of instruction and item: “Visualize a rising sun. Consider carefully the picture that comes before your mind’s eye” (instruction). “The sun is rising above the horizon into a hazy sky” (item).

Daydreaming Frequency Scale. The final measure added as a control measure was the Daydreaming Frequency Scale by Stawarczyk et al. (2012). Here, the response scale originally also was a multiple choice-single answer scale. Like with the VVIQ, and for the

same reasons, I chose to change this scale to a 7-point likert scale with the two polar options at each end. Example of item: “When I am not paying attention to some job, book, or TV, I tend to be daydreaming…” See Appendix F for the full list of items.

At the end of the survey participants were asked two control questions to check whether they understood the concept of situational cues or not (e.g. “I believe I understood what was meant by thinking about future actions”). In addition, an attention check question was presented toward the end of the survey, asking participants not to answer, but to go directly to the next question. Participants who did not pass the attention check were excluded from the study.

Statistical Analysis

Statistical analysis was performed using IBM SPSS statistics 28.0. In line with the pre-registered analysis plan, all participants who did not pass the attention check question “Do not answer this question and move on to the next” were removed ($n = 4$). Further, Cronbach’s alpha was calculated for each questionnaire Consc. = 0.78, Cue. = 0.88, Vivid. = 0.91, Day. = 0.94. The total score for the remaining participants ($N = 96$) on the four measurements, was then calculated by summing up each item score per questionnaire and calculating a mean score per questionnaire. See Table 1 for descriptive statistics. An initial correlational analysis was done to compare the final partial correlation with the Daydreaming Frequency Scale as a control variable (see also Table 1).

Table 1

Mean (M), standard deviation (SD), minimum (Min) and maximum (Max), Pearson's correlation, and Partial correlation analysis for the study variables ($N = 96$)

	M(SD)	*Min/Max*	1.	2.	3.	4.
1. Consc.	4.90 (1.26)	2/7	1.00			
2. Cue.	5.11 (1.26)	1/7	.25* (.28**)	1.00		
3. Vivid.	5.45 (1.02)	2/7	–.02 (.05)	.20† (.20†)	1.00	
4. Day.	4.81 (1.21)	2/7	–.37**	.03	.18	1.00

Note: Values for the partial correlation with Daydreaming as control variable are in parenthesis. Consc. = scores on Conscientiousness Scale, Cue. = scores on Situational Cue-thought Questionnaire, Vivid. = scores on Vividness of Visual Imagery Questionnaire, Day. = scores on the Daydreaming Frequency Scale.

$^{\dagger}p \leq .10$. *$p < .05$. **$p < .01$ (two-tailed test).

Results

Pre-registered Hypotheses

Results from the correlation analysis and the partial correlation analysis can be found in Table 1. The results indicate support for H1, with a significant Pearson's correlation coefficient between conscientiousness and cue-thought $r(94) = .25$, $p = .014$. This correlation is also significant when controlling for daydreaming $r(94) = .28$, $p = .006$. For H2, there was no significant support. However, there was a marginally significant trend between cue-thought and vividness $r(94) = .20$, $p = .055$, also when controlling for daydreaming $r(94) = .20$, $p = .059$. There was no significant correlation between conscientiousness and vividness indicating no support for H3.

Other Results

Table 1 shows that conscientiousness correlates negatively with daydreaming $r(94) = -.37$, $p < .001$.

Discussion

Conscientiousness and the Use of Situational Cue-Thought Planning

Study one included three hypotheses, H1 being that if the use of situational cues when planning is a characteristic of conscientiousness, then people who score high on conscientiousness will tend to use situational cues more when planning. There was support for this hypothesis with the positive correlation between situational cue-thought planning and conscientiousness. As this is only a correlational relationship, I cannot draw a causal conclusion based on this finding. However, replicating this finding from Martiny-Huenger et al. (2022) gives insight into how conscientious people might implement strategies in their daily lives to attain personal goals. Moreover, these results are in line with the suggestion by Martiny-Huenger et al. (2022) that situational cue-thought planning might be a characteristic behavior of the personality trait conscientiousness.

Vividness of Visual Imagery in the Use of Situational Cue-Thought Planning

For the second hypothesis (if the use of situational cues requires high vividness of visual imagery to identify a suitable cue, then people who often use situational cues when planning will score higher on vividness of visual imagery questionnaire), my results showed a trend. Alone, these results can be considered a weak argument for the relevance of visual detail in the use of situational cue-thought. However, finding a negative correlation between daydreaming and conscientiousness helps support this notion. I argue this because the two concepts *daydreaming* and *vividness of visual imagery* both measure a type of imagining. However, daydreaming can be seen as un-purposeful and quite contradictory to the traits of conscientiousness (Roberts et al., 2014). On the other hand, vividness of visual imagery aims

to capture a way of imagining that increases episodic foresight ability and thus, planning efficiency, much like the conscientiousness trait.

Therefore, the overall pattern of the relationships (i.e. to find both a positive correlation between cue-thought and conscientiousness, and a trend between situational cue-thought planning and vividness when controlling for daydreaming, in addition to a negative correlation between conscientiousness and daydreaming) indicates that vividness is a concept related to the use of situational cue-thought. Secondly, it might insinuate that the vividness of the visual imagery questionnaire is more related to purposeful imagining than un-purposeful daydreaming, and thus, indeed measure what I aimed it to measure.

Vividness of Visual Imagery and Conscientiousness

My results gave no support for H3 (if the use of situational cues when thinking about future action is linked to high vividness of visual imagery, then people who score high on conscientiousness will also have greater vividness of visual imagery). This means that there was no significant correlation between conscientiousness and vividness of visual imagery. These results might indicate that vividness of visual imagery does not relate to the personality trait conscientiousness. However, the lack of correlation between these two variables might also be due to the way one defines a personality trait. Research on personality traits often has two differing views on this matter. Some researchers define personality traits as internal *causal* explanations of behavior, while others view personality traits as *descriptive summaries* of behavior (Larsen et al., 2017). If we think of conscientiousness as an internal cause of behavior, then one would expect conscientiousness to be a mechanism that aids people in self-regulation. Therefore, one would expect to see a direct relationship between vividness and conscientiousness if vividness of visual imagery was a part of this mechanism that makes conscientious people good planners.

On the other hand, if one views conscientiousness as merely an overarching description of behavior, without drawing causal conclusions (Boag, 2011), then one might not expect there to be a clear relationship between these two variables. Consequently, if situational cue-thought is merely one of many characteristic behaviors of conscientiousness, and having good visual imagery can aid in using this planning strategy, then it is not surprising to not see a direct relationship between vividness and conscientiousness. Moreover, if one scores high on the personality trait of conscientiousness, it does not mean that one possesses all the characteristics associated with this trait.

Study Two: The Relationship Between Cue-Thought, Vividness, and Self-Regulation Success

The second part of this thesis aims to take the previous research one step further in investigating the relationship between situational cue-thought, vividness of visual imagery, and conscientiousness by including measurements of self-reported self-regulation based on goal achievement. This second study also bases upon previous research from Martiny-Huenger et al. (2022) and Kristiansen et al. (2023) that showed that people who often used situational cues when planning future action had better self-regulation success, both, self-reported and observed. Additionally, they scored higher on conscientiousness. Therefore, the second data collection will be a replication of the first study, including three additional questionnaires measuring self-regulatory success in the form of goal achievement.

Based on the second pre-registered hypothesis (H2) from study one (if the use of situational cues requires high vividness of visual imagery to identify a suitable cue, then people who often use situational cues when planning will score higher on vividness of visual imagery), I further hypothesize in the second part of this thesis that a requirement for the effectiveness of situational cue-thought planning is a high level of vividness of visual imagery. This leads to the hypothesis that: if the use of situational cue-thought planning is

related to greater self-regulatory success and a higher level of vividness of visual imagery is related to better situational cue-thought planning, then vividness of visual imagery will be a moderator for the relationship between situational cue-thought planning and self-regulatory success. With an increase in the degree of vividness of visual imagery, the cue-thought – goal-achievement success relationship should become stronger (H1b). In addition, I expect this moderation to be moderated by goal commitment which leads to the second hypothesis that: the vividness moderation should become stronger with increasing goal commitment scores (H2b).

Method

Ethics

The ethical approval for this study was granted by The Institute of Psychology at UiT The Arctic University of Norway (Reference code: 05/24/R2). The project and hypotheses were pre-registered at Open Science Framework (https://osf.io/6z59h).

Participants and Design

G*Power was used to conduct a power analysis for a moderation effect. I used the t-test option (one-sided) with four variables to obtain a power of .80 and to detect a small to medium effect size of 0.06 at the standard .05 alpha error probability. This resulted in a required sample of one hundred-five participants. The participants were recruited in the same way as in study one, however, the e-mail also stated that if someone had participated in study one, they could not participate in study two. In addition, to further ensure that the same people did not participate in both studies, the e-mail was sent to different study programs for the second study. This resulted in fewer participants, and forty participants remained to reach the required sample size. The remaining participants were then collected using Prolific.

Identical to study one, participation was voluntary and anonymous. Anonymity was secured by not asking any demographical questions besides age and gender. In addition, all

email addresses were stored on a different server than the answers to the survey, making it so they could not be connected. All participants had to consent to participate before they were allowed to start the survey.

The survey in the second data collection included questions about eating habits (HEVS eating habits questionnaire). As nutrition-related questions may be a sensitive topic to some, I found it necessary to include information about this in the consent form, so that those who found such questions uncomfortable could choose not to participate in the study. See Appendix B for full information and consent form. Consent for study two was also given by checking the following boxes: “I consent to participate in this study”, “I have read the information above and understand the purpose of this study. I understand my right to withdrawal.”, “I am 18 years old or older.”. As an incentive, participants could participate in a lottery to win one of two gift cards of 500,- NOK. Instructions to participate in this lottery were given at the end of the study. See Appendix B for full information and consent text.

Materials

The second study included the same materials as study one, but an additional three questionnaires were added to the survey: the International Physical Activity Questionnaire (IPAQ), short form (Craig et al., 2003), The Healthy Eating Vital Signs (HEVS) (Greenwood et al., 2012), and a Goal Commitment scale (Hollenbeck et al., 1989). These additional questionnaires aimed to measure self-regulatory success, based on goal achievement and goal commitment on the goals “Being physically active” and “Eating healthy”.

International Physical Activity Questionnaire (short form). This questionnaire by Craig et al. (2003) measures participants’ level of physical activity during the last seven days (e.g. “During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?”) See Appendix I for a full list of items.

Originally, this questionnaire measures physical activity on the levels- vigorous physical activities (activities that require hard efforts such as heavy lifting and fast bicycling), moderate physical activities (activities that take moderate effort such as carrying light loads or bicycling at a regular pace), and walking (to or from different places or for recreation, exercise, or leisure). However, I chose to not include questions about walking in this survey. This is based on the notion that there are many factors other than "wanting to be physically active" that can influence how much walking one does during a week. This can be variables such as not owning a car, having a job that requires walking, or simply living far away from a train/bus station. I, therefore, argue that measuring vigorous and moderate physical activity will more accurately measure intentional physical exercise that may be influenced by having a goal to be physically active.

The Norwegian translation for the specific questionnaire used in this study was found on the official website for the IPAQ scale (IPAQ, 2022). Originally, this questionnaire has an open-ended answer design. In this study, however, I again chose to change the response measurement to a numerical likert scale ranging from 0-7. This is justified, firstly, by the fact that it is less confusing for the participants that the response format is the same throughout the survey. Secondly, the IPAQ physical activity and the HEVS healthy eating questionnaires were combined into a single "goal achievement score" and therefore it makes it easier to analyze if they have the same scale. Lastly, my goal is to merely measure the *level* of activity. Thus, a higher or lower response on the likert scale will be an equally good measure of activity level, than a higher or lower number in an open-ended response.

The Healthy Eating Vital Signs (HEVS). This 12-item dietary questionnaire was developed by Greenwood et al. (2012) to use as a measure of eating behavior. In study two, this questionnaire is used to assess goal achievement based on the goal "eating healthy". The response scale for this questionnaire is for questions 1-11 a likert scale that ranges from 1 to

"more than 7". For question 12 "When eating restaurant food or fast food, do you eat all of the food served to you at one time?" the response scale is a likert scale that ranges from "Never" to "Always". In line with the previous questionnaire, I also chose to change the likert scale from 0-7 on questions 1-11, and 1-7 on question 12. An example of an item from this questionnaire is "How many times did you eat restaurant or fast food last week? (For example McDonald's, Burger King, etc.)". See Appendix J for the full list of items.

Goal commitment scale. This four-item goal commitment scale (Hollenbeck et al., 1989) was presented two times at the beginning of the survey, once for evaluating commitment to the goal "eating healthy", and once for evaluating commitment to the goal of "being physically active". An example of one item from this scale is "It's hard to take this goal seriously". See Appendix G and H for the full list of items. This scale originally had answer options on a 5-point likert scale with the anchors strongly agree/strongly disagree. Like for the rest of the questionnaires, I also chose to change this scale to a 7-point likert scale with the anchors totally agree/totally disagree.

Statistical analysis

Statistical analysis was performed using IBM SPSS statistics 28.0. Participants who did not pass the attention check question "Do not answer this question and move on to the next" were removed (n = 5). Our goal was to collect one hundred and fifteen participants. However, one hundred and nineteen participants completed the survey, and because only five did not pass the attention check, our total sample size ended up being N = 114.

Cronbach's alpha was calculated for each questionnaire (Consc. = 0.76, Cue. = 0.91, Vivid = 0.94, and Day. = 0.96, Com. Ex. = 0.77, IPAQ = 0.761. For the two questionnaires regarding eating: goal commitment for eating healthy, and the HEVS healthy eating, the Cronbach's alpha did not reach statistically acceptable values (Com. Eat. = 0.62, HEVS =

0.45). By excluding four items: 5, 6, 11, and 12 (See Appendix J for specific items) from the HEVS healthy eating, Cronbach's alpha reached a value of .63.

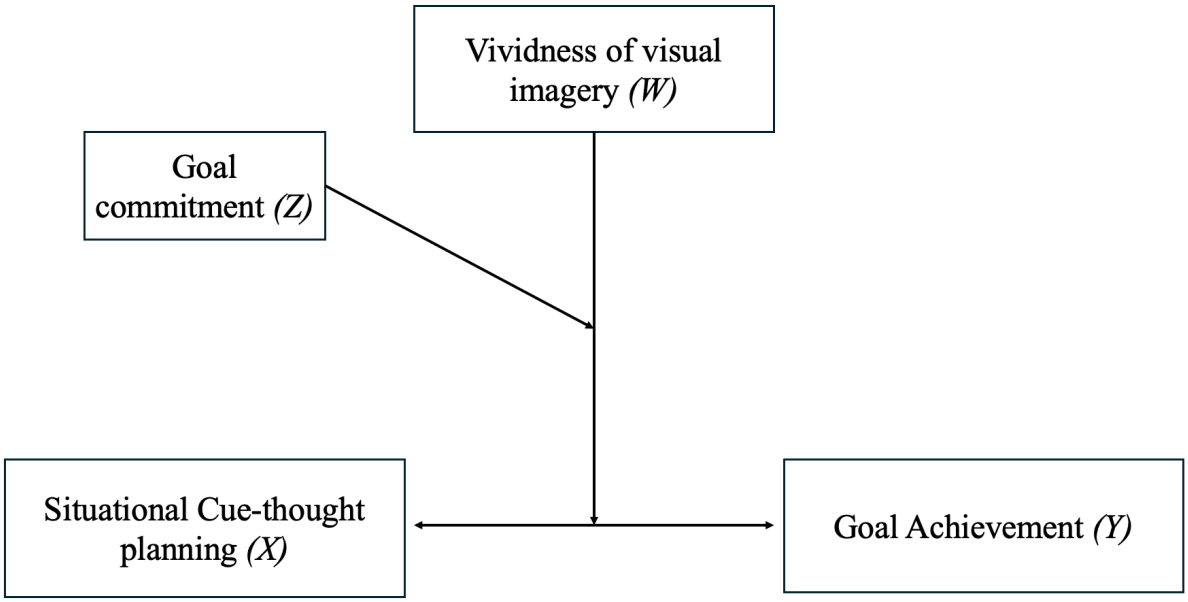
Because any value below 0.65 is deemed not acceptable, I chose to deviate from the original pre-registered analysis and do three separate moderation analyses. Moderation analysis one was run with the scores from the IPAQ physical activity and the HEVS healthy eating combined into a total "goal achievement score". Here, the goal commitment to physical activity and eating healthy is also combined (pre-registered method). Moderation analysis two was run with the IPAQ physical activity as goal achievement measure, as well as goal commitment for just physical activity. Moderation analysis three was run with the HEVS healthy eating scores as goal achievement measure, as well as goal commitment for eating healthy. By doing three separate moderation analyses, I could better control for the low alpha values in the HEVS healthy eating and the goal commitment scale for eating healthy.

After excluding participants who did not pass the attention check and calculating the Cronbach's alpha for each questionnaire, the score for the remaining participants on the six measurements was then calculated by summing up each item score per questionnaire into a mean score. See Table 2 for descriptive statistics of the questionnaires. Like in study one, an initial correlational analysis was done to compare the final partial correlation with the Daydreaming Frequency Scale as a control variable (see Tables 3 and 4).

For the central hypotheses (H1b and H2b), three separate regression analyses (moderated moderation analysis) were run using model 3 in PROCESS macro for SPSS (Hayes, 2022). The moderation analysis was run with cue-thought as the predictor, level of success on the goal (either HEVS healthy eating or IPAQ physical activity or combined) as response variables, vividness as the primary moderator variable, and goal commitment as the secondary moderator. The model included all interactions between these variables as well. Figure 1 shows the model for the moderation analysis.

Figure 1

Moderated moderation model of the effect of vividness and goal commitment on the relationship between situational cue-thought planning and goal achievement



Note. The model shows how our hypothesis predicts that vividness will be the primary moderator for the relationship between situational cue-thought planning and goal achievement. This moderation effect will be moderated by goal commitment.

Table 2

Mean (M), standard deviation, minimum (Min) and maximum (Max) for study variables (*N* = 114)

	M	*SD*	*Min*	*Max*
Conscientiousness	4.78	1.26	1.00	7.00
Cue-Thought	4.65	1.35	1.00	7.00
Vividness	5.14	1.26	1.00	7.00
Daydreaming	4.25	1.44	1.17	7.00
Com. Activity	5.15	1.22	2.00	7.00
Level Activity	2.01	1.28	.00	5.50
Com. Heathy Eating	4.82	1.06	2.50	7.00
Level Healthy Eating	5.04	0.55	3.63	6.75
Level Commitment	4.99	0.90	3.00	7.00
Level Achievement	3.53	0.74	2.06	5.69

Note: Com. Activity = scores on goal commitment scale for physical activity, Level Activity = scores on IPAQ physical activity, Com. Healthy Eating = scores on HEVS healthy eating, Level Healthy Eating = scores on goal commitment for eating healthy, Level Commitment = combined scores for goal commitment, Level Achievement = combined scores on IPAQ physical activity and HEVS healthy eating.

Table 3

Pearson's correlation for study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Conscientiousness	1.00									
2. Cue-Thought	.23*	1.00								
3. Vividness	.04	.16†	1.00							
4. Daydreaming	–.21*	.04	.39**	1.00						
5. Com. Activity	.12	–.08	.01	–.17†	1.00					
6. Level Activity	.11	–.12	.02	–.09	.51**	1.00				
7. Com. Healthy Eating	.28**	.11	.07	.01	.25**	.11	1.00			
8. Level Healthy Eating	.00	.16	–.05	–.10	.05	.16 †	.14	1.00		
9. Level Achievement	.10	–.05	–.00	–.11	.46**	.93**	.15	.51**	1.00	
10. Level Commitment	.25**	.01	.05	–.11	.82**	.41**	.76**	.11	.40**	1.00

Note: N = 114. Com. = Commitment, Level Achievement = combines scores for IPAQ physical activity and HEVS healthy eating, Level Commitment = Combined scores for commitment.

†$p \leq .10$. *$p < .05$. **$p < .01$ (two-tailed test).

Table 4

Partial correlation analysis for study variables with Daydreaming Frequency Scale as a control measure

Control variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
Daydreaming									
1. Conscientiousness	1.00								
2. Cue-Thought	.24*	1.00							
3. Vividness	.13	.16†	1.00						
4. Com. Activity	.09	–.07	.08	1.00					
5. Level Activity	.10	–.12	.06	.50**	1.00				
6. Com. Healthy Eat.	.29**	.11	.08	.26**	.12	1.00			
7. Level Healthy Eat.	–.02	.16†	–.01	.03	.15	.14	1.00		
8. Level Commitment	.23*	.01	.10	.82**	41**	. .76**	.10	1.00	
9. Level Achievement	.10	–.04	.05	.45**	.92**	.15	.50**	.39**	1.00

Note: $N = 114$. Com. = Commitment, Level Achievement = combines scores for IPAQ physical activity and HEVS healthy eating, Level Commitment = Combined scores for commitment.

†$p \leq .10$. *$p < .05$. **$p < .01$ (two-tailed test).

Results

Replication of Study One

Like study one, results from study two also give support to H1 with a significant Pearson's correlation coefficient between conscientiousness and cue-thought $r(112) = .23$, $p = .015$. This correlation was also significant when controlling for daydreaming $r(112) = .24$, $p = .010$. For H2 there was a trend between cue-thought and vividness $r(112) = .16$, $p = .091$. This trend did also show when controlling for daydreaming $r(112) = .16$, $p = .098$. For H3 there was no significant correlation between vividness and conscientiousness. There was, however, a negative correlation between daydreaming and conscientiousness $r(112) = –.21$, $p = .025$. Contrary to study one, there was here a positive correlation between daydreaming and vividness $r(112) = .39$, $p < .001$.

Pre-Registered Hypothesis

Only results relevant to the pre-registered hypothesis are reported here. For full moderation tables of all three moderations, see Appendix L.

Moderation Analysis with Combined Physical Activity/Healthy Eating Scores. Moderation analysis including both measures of goal achievement and goal commitment showed a significant model $F(7,106) = 4.79$, $p = < .001$, R^2, $= .24$. There was a significant effect of the interaction between cue-thought and vividness $b = .13$, SE = .06, $p = .040$, 95% CI [0.01, 0.26]. In addition, there was a significant effect of the three-way interaction between cue-thought, vividness, and goal commitment $b = –.11$, SE = .05, $p = .039$, 95% CI [–0.22, 0.01]. Figure 2 shows the interaction plots for this model.

Moderation Analysis with Physical Activity Scores. A linear regression analysis with the IPAQ physical activity score (goal achievement) as the dependent variable, and cue-thought, vividness, and goal commitment for physical activity as predictors showed that the model was significant $F(7,106) = 6.92$, $p < .001$, $R^2 = .31$. There was a significant interaction

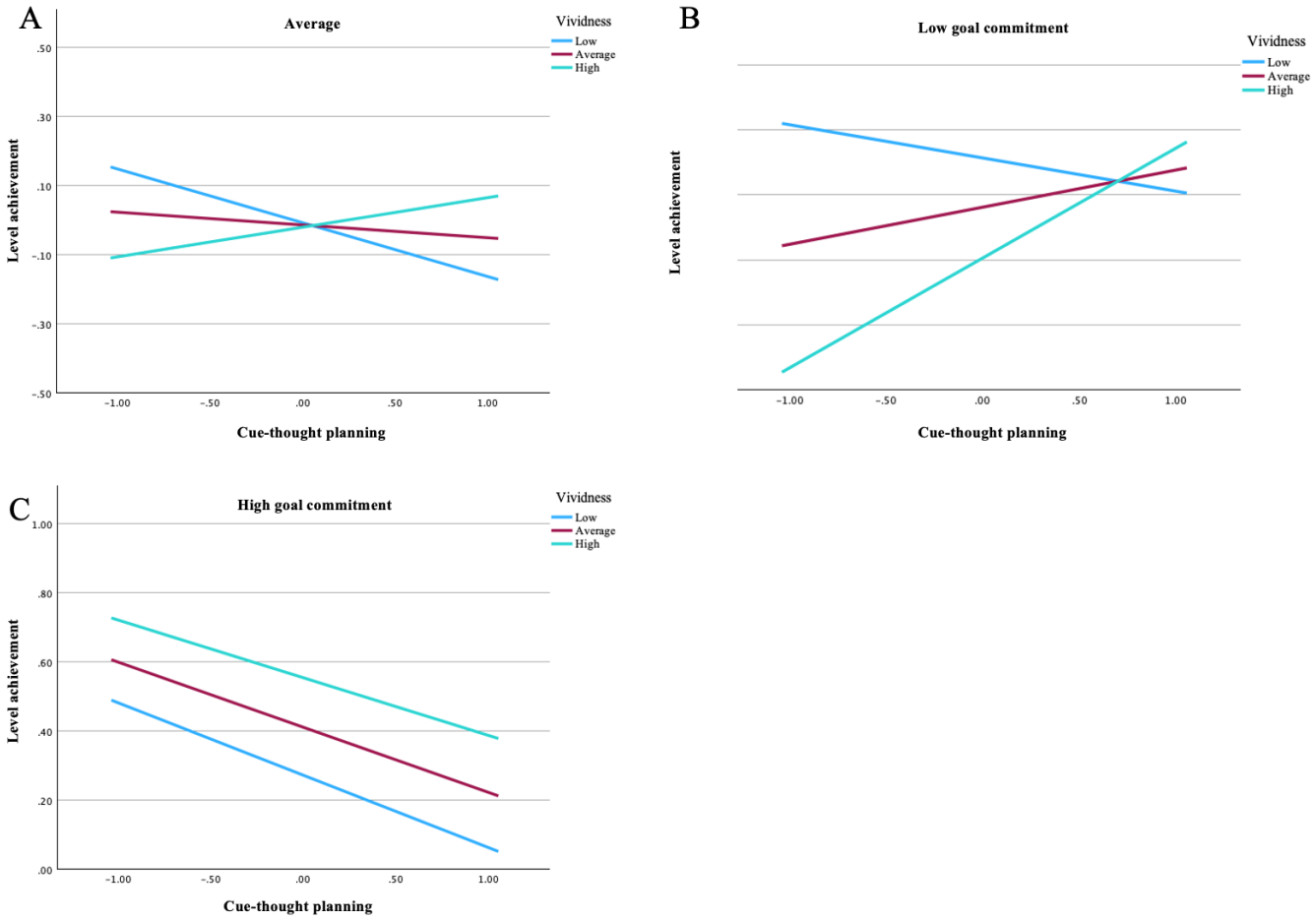
between the variables cue-thought and vividness b = .15, SE = .07, p = .028, 95% CI [0.02, 0,28]. There was also a trend for the three-way interaction between cue-thought, vividness, and goal commitment b = .10, SE = .05, p = .071, 95% CI [–0.20, 0.01]. Figure 3 shows the interaction plots for this model.

Moderation Analysis with Healthy Eating Scores. The third moderation analysis included only scores for the HEVS healthy eating as goal achievement and only scores from goal commitment for eating healthy. The model was not significant $F(7,106) = .10$, p = .510, R^2 = .06. Here, there was also no significant effect of the interaction between cue-thought and vividness b = .01, SE = .07, p = .906, 95% CI [–0.14, 0.15], and no significant effect of the three-way interaction between cue-thought, vividness, and goal commitment b = –.04, SE = .07, p = .623, 95% CI [–0.18, 0.11]. Figure 4 shows the interaction plots for this model.

Exploratory Analysis. An exploratory moderation analysis of the effect of vividness on the relationship between conscientiousness and goal achievement (including only IPAQ physical activity scores) showed that the model was significant $F(7,106) = 5.72$, $p < .001$, R^2 = .27. However, there was no interaction effect between vividness and conscientiousness b = .10, SE = .07, p = .154, 95% CI [–0.04, 0.24], and no significant three-way interaction between conscientiousness, vividness, and goal achievement b = .00, SE = .08, p = .959, 95% CI [–0.16, 0.17].

Figure 2

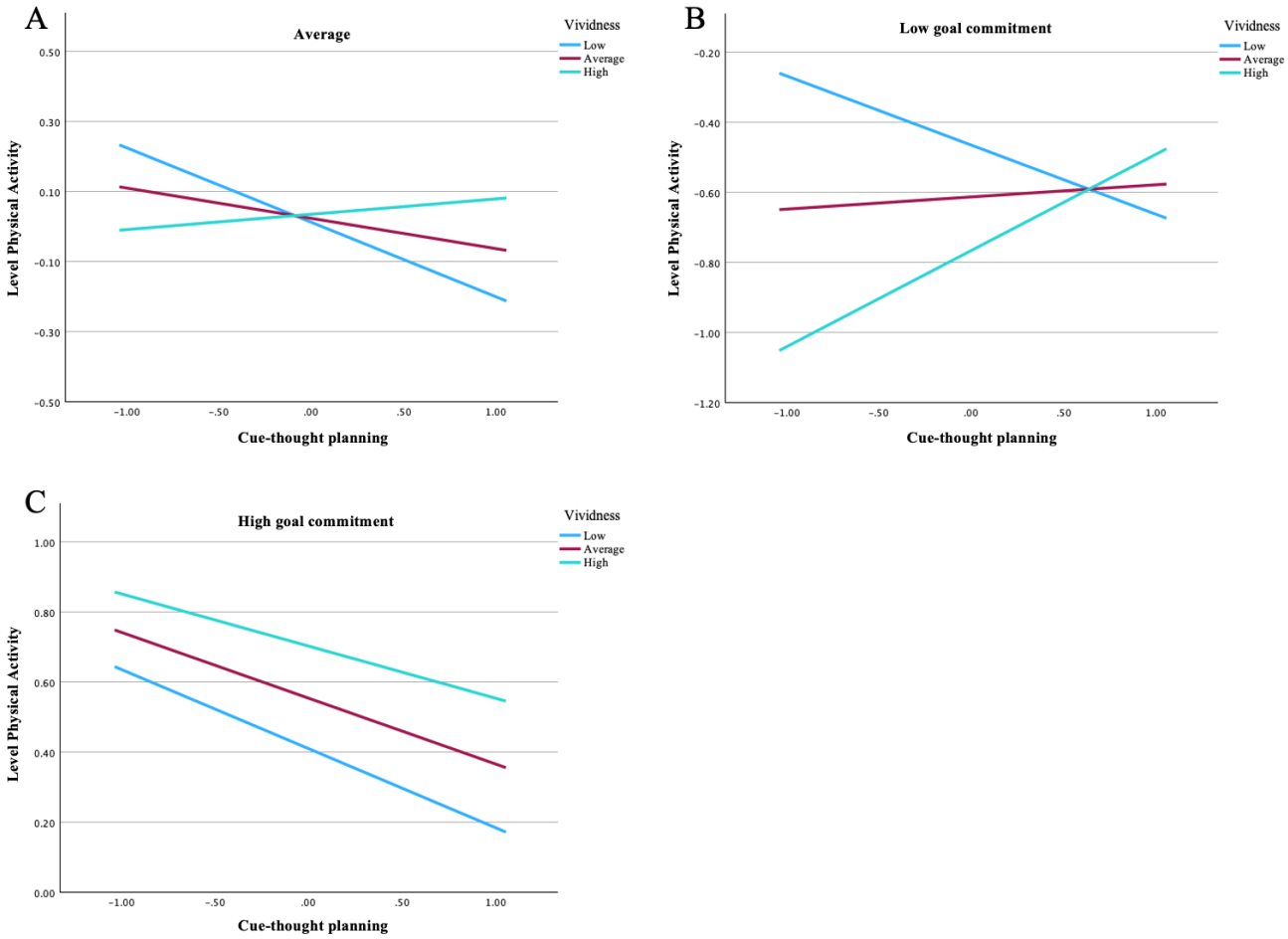
Interaction plots for the moderating effect of vividness on the relationship between goal achievement and cue-thought planning using combined IPAQ physical activity and HEVS healthy eating scores for goal achievement



Note. Plot A: The overall interaction of vividness on the relationship between goal achievement and cue-thought planning. Plot B: The interaction of vividness on the relationship between goal achievement and cue-thought planning for low goal commitment. Plot C: The interaction of vividness on the relationship between goal achievement and cue-thought planning for high goal commitment.

Figure 3

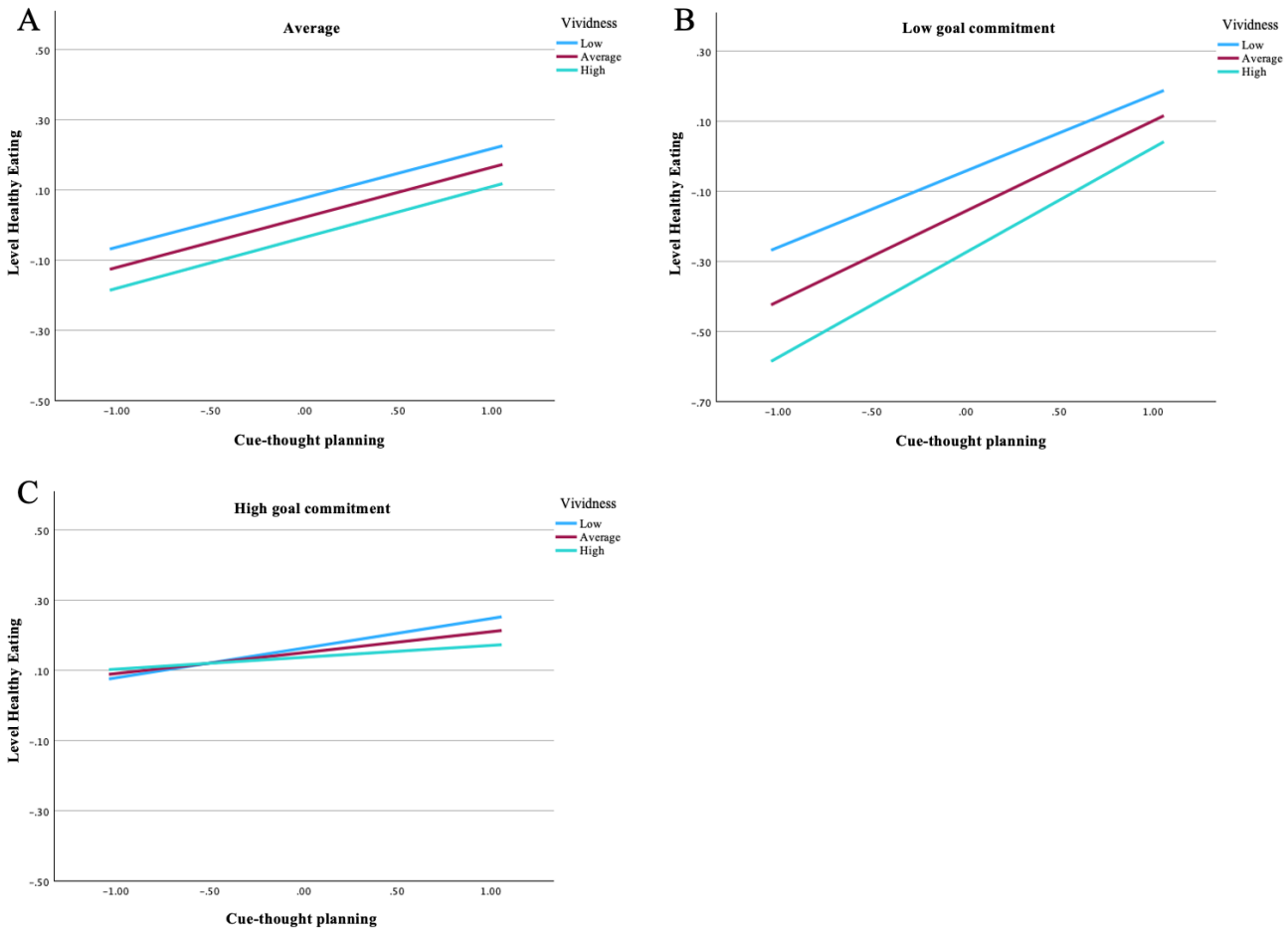
Interaction plots for the moderating effect of vividness on the relationship between goal achievement and cue-thought planning using IPAQ physical activity scores for goal achievement



Note. Plot A: The overall interaction of vividness on the relationship between goal achievement and cue-thought planning. Plot B: The interaction of vividness on the relationship between goal achievement and cue-thought planning for low goal commitment. Plot C: The interaction of vividness on the relationship between goal achievement and cue-thought planning for high goal commitment

Figure 4

Interaction plots for the moderating effect of vividness on the relationship between goal achievement and cue-thought planning using HEVS healthy eating scores for goal achievement



Note. Plot A: The overall interaction of vividness on the relationship between goal achievement and cue-thought planning. Plot B: The interaction of vividness on the relationship between goal achievement and cue-thought planning for low goal commitment. Plot C: The interaction of vividness on the relationship between goal achievement and cue-thought planning for high goal commitment.

Discussion

Replication of Study One

The second study successfully replicated most of the findings from study one. Like in the first study, there was a statistically significant Pearson's correlation between situational cue-thought planning and conscientiousness, giving support to H1, that: if the use of situational cues when planning is a characteristic of conscientiousness, then people who score high on conscientiousness will tend to use situational cues more when planning. This further strengthens the suggestion that situational cue thought planning might be a characteristic behavior of conscientiousness. However, as this study only looked at the correlation between the variables, one cannot draw a causal conclusion about the direction of the relationship. As per the argument made earlier about how one perceives personality traits (Larsen et al., 2017), the correlation between the trait of conscientiousness and habitually using situational cues when planning doesn't provide direct evidence of whether conscientiousness leads to the use of situational cues when planning, or if the use of situational cues when planning (and having better self-regulatory success) leads to higher scores on the conscientiousness trait.

In study two, there was also a trend between cue-thought and vividness. Taken together with the trend that was also found in study one, this gives more strength to our pre-registered hypothesis that if the use of situational cues requires high vividness of visual imagery to identify a suitable cue, then people who often use situational cues when planning will score higher on vividness of visual imagery questionnaire (H2). Finding a trend in two independent datasets might indicate that this effect is not random, but maybe that my particular sample is too small to find the effect. However, as the correlation is not significant, but trending, this cannot be concluded from the present research. These results, along with other research finding individual differences in visual imagery (Blomkvist, 2023; Knäuper et al., 2009) shed light on the importance of visual imagery, and how it can influence daily self-regulatory success. Investigating the mechanism behind situational cue-thought planning may also offer some explanation as to why some people tend to use situational cues when planning

and some do not. The lack of support for H3 (If the use of situational cues when thinking about future action is linked to high vividness of visual imagery, then people who score high on conscientiousness will also have greater vividness of visual imagery) indicates further that there is no direct relationship between conscientiousness and vividness of visual imagery.

Pre-Registered Hypotheses

Due to low internal consistency (Cronbach's Alpha) in the HEVS healthy eating and goal commitment for healthy eating questionnaires, I had to deviate from the original pre-registered method and do three separate moderation analyses instead of one. I, therefore, find it necessary to discuss each of them in turn.

Moderation Analysis with Combined Physical Activity/Eating Scores. The first moderation model included the combined scores for goal commitment and goal achievement. In this model, both the interaction between cue-thought and vividness and the three-way interaction between cue-thought, vividness, and goal commitment were significant. The interaction plot (Figure 2) shows that, as pre-registered, a high level of vividness makes the statistical direction of the relationship between goal achievement and cue-thought more positive. In contrast to the pre-registration, this effect is shown for people with low goal commitment, but not for people with high goal commitment. I will discuss more about these results in the general discussion. Overall, this model supports the hypothesis that vividness acts as a moderator for the relationship between cue-thought and goal achievement (H1b), but not the hypothesis that this moderation effect should become stronger the more commitment one has to the goal (H2b).

Moderation Analysis with Physical Activity Scores. For the second moderation model including only scores from the IPAQ physical activity as a measure of goal achievement and only the goal commitment for physical activity, the results were similar. This model was also significant, but here, only the interaction between cue-thought and

vividness was significant. The three-way interaction reaches a trend in this model. Figure 3, Plot A, shows the overall interaction plot for vividness on the relationship between cue-thought and goal achievement. This interaction looks similar to the interaction in Figure 2, albeit it is a little more tilted in a negative direction. Further, there is also an interaction effect similar to the model including combined scores- for people with low goal commitment, but no interaction effect for a high level of goal commitment. Overall, the results from this model show consistency with the results from the model that includes the combined scores. Thus, this model also supports the hypothesis that vividness of visual imagery acts as a moderator for the relationship between cue-thought and goal achievement (H1b), but not the hypothesis that this moderation effect should become stronger the more commitment one has to the goal (H2b).

Moderation Analysis with Healthy Eating Scores. For the third moderation model including the HEVS healthy eating scale for goal achievement and goal commitment for eating healthy, there was no significant effect, and no significant interactions (Figure 4). This is not surprising, considering the fact that the internal consistency for these two measures did not reach statistically satisfying values, indicating that there is a problem with the reliability of the measures.

Exploratory Findings

Because there was no significant correlation between conscientiousness and vividness in the first study, I did not expect to find a moderation effect of vividness for the relationship between conscientiousness and goal achievement. There was therefore no surprise, that the exploratory moderation analysis did not show any interaction effect. Further, results from the correlational analysis in the second analysis showed a significant correlation between vividness of visual imagery and daydreaming, contradictory to the first study, where there was no correlation between them. This may indicate that the concept of imagining something

might be related to the concept of daydreaming, or that the two are not that different from each other.

General Discussion

In the present study, I have provided a foundation for situational cue-thought planning and how it is assumed to work as a self-regulatory strategy based on the two mechanisms of *If-then* planning, namely "cognitive accessibility" and the "stimulus-response link". I have highlighted previous research on the relationship between situational cue-thought planning, conscientiousness, and self-regulatory success. Additionally, I have presented and argued for a perspective on what might influence the effectiveness of situational cue-thought planning-namely vividness of visual imagery in episodic foresight.

The present study's results indicate further a relationship between the use of situational cue-thought planning and the personality trait conscientiousness. This is in line with the suggestion from Martiny-Huenger et al. (2022) that situational cue-thought planning might be a characteristic behavior of the personality trait conscientiousness. However, as the nature of the relationships found in the present research is merely correlational, one cannot draw such a causal conclusion. Further, the present research suggests that vividness of visual imagery might be related to the use of situational cue-thought planning based on two trending correlations between these variables. This, again is in line with the idea that vividness of visual imagery may be a prerequisite for the effectiveness of situational cue-thought planning, however as mentioned before, the present study cannot draw a causal conclusion due to the correlational design of the study.

The second part of the present research gave support to the hypothesis that vividness of visual imagery moderates the relationship between situational cue-thought planning and self-regulatory success (H1b). These findings are also in line with previous research on the effect of mental imagery on implementation intentions (Knäuper et al., 2009) that found that

mental imagery could strengthen implementation intentions, and suggested that mental imagery could be a moderator for the effect of implementation intention on goal achievement. Considering this, and the recent research on Congenital Aphantasia that found great individual differences in the ability to visualize both voluntary and involuntary images (Blomkvist, 2023), the results from this research give further insight into how individual differences such as the level of visual imagery might affect everyday self-regulation strategy and success.

For the pre-registered hypothesis that the moderation effect of vividness will become stronger the more commitment one has to the goal (H2b), there was no support. Contrary to the hypothesis, results suggest that the more goal commitment one has, the less impact vividness has on the relationship between cue-thought and goal achievement. In fact, as Figure 2 shows, there was no interaction effect of vividness for the people with the most goal commitment. The original idea here was that commitment to the goal would aid in the willingness to plan and execute the goal without having reached the goal consistently- and therefore vividness would be more beneficial for people with more commitment. However, results show that the effect is going in the opposite direction.

This lack of support for H2b might be explained by the effect of habits. A huge part of our day-to-day behavior is guided by habits, and they are closely linked (but not dependent on) goal pursuit (Wood & Rünger, 2016). Habits allow a person to not purposefully think about the intended action but are rather influenced by contextual cues, much like situational cue thought planning. However, the formation of habits is created by repetitive linking of contextual cues and behavior, instead of *intentionally* pairing cues with desired behavior (Wood & Rünger, 2016).

Previous research by Kristiansen et al. (2023) on the relationship between situational cue-thought planning and self-regulation success controlled for the impact of habits by asking

participants to make a plan to do a novel behavior (e.g. take a picture of a hand-sanitizer dispenser and upload it). Here, they could argue that habits would have a limited role in self-regulation success because participants were asked to execute a behavior they most likely had not done before and would therefore not have a habit of doing. However, in the present research, I asked participants about behavior that most likely will be impacted by habits in their daily life (Gardner et al., 2011). For example, a person who exercises regularly has repeated the same behavior many times, creating a habit of exercising, and therefore not having to consciously plan this behavior every time. Results from the correlation analysis in study two show that goal commitment correlates with the level of achievement- for both, physical activity, healthy eating, and the combined scores. This also supports this line of argument in the way that the people who have a high commitment to the goal are the ones who do this behavior habitually. Moreover, it is possible that even though people have strong habits of doing something, they report high commitment to the goal. This may be caused by the fact that people hold many self-serving biases, and taking agency for achieving a goal, rather than attributing it to habits is in line with this (Campbell & Sedikides, 1999) .

Therefore, the lack of interaction effect for people with high goal commitment might stem from the fact that people who exercise much do not need to plan this behavior by using situational cue-thought planning and vividness of visual imagery, but rather, effortlessly perform this behavior through habits. This would also cause people with low commitment to the goal (and low achievement) to benefit more from having a high level of visual imagery because they more often need to plan this behavior (using cue-thought planning).

As mentioned in the introduction of this thesis, one overarching question in research about goal achievement and self-regulatory strategy is how to breach the intention-behavior gap (Bieleke et al., 2021; Sheeran & Webb, 2016). By looking at people who generally have good self-regulatory success, like highly conscientious individuals, one can begin to figure

out what mechanism aids in this success. Previous research has contributed to this by suggesting that spontaneous inclusion of situational cues in planning is one mechanism that might cause conscientious people to have greater self-regulatory success (Kristiansen et al., 2023; Martiny-Huenger et al., 2022). The present research contributes to this field of research by further examining the relationship between situational cue-thought planning, vividness of visual imagery, and conscientiousness. Based on the present research, the relationship between conscientiousness and situational cue-thought planning has been strengthened by finding this correlation in two more independent samples. This again strengthens the assumption made by Martiny-Huenger et al. (2022) that situational cue-thought planning might be a characteristic behavior of conscientiousness.

Further, the present research has also found a trend between situational cue-thought planning and vividness in both studies, indicating a relationship between the two variables. In addition, study two found a significant moderation effect of vividness of visual imagery on the relationship between situational cue-thought planning and self-reported self-regulation success. These findings highlight the importance of taking into consideration how such individual differences can influence self-regulation success.

Based on the present research, one explanation for the effectiveness of situational cue-thought planning as a self-regulation strategy might be aided by visually imagining the situational cues in vivid detail, allowing for an even stronger stimulus-response link (Knäuper et al., 2009). The effectiveness of visual imagery seems to be relevant when applied to novel behavior, i.e. when consciously making a plan to execute a behavior, but not necessarily relevant when habits are already formed for the particular behavior.

Limitations and Future Direction

The most prominent limitation of a study like this is the self-report design of the study. All results rely on people's own opinions about their behavior, which has been proven

to not always reflect actual behavior (Schwarz & Oyserman, 2001). However, for the purpose of this study (and measuring quite abstract concepts), I found it necessary to use self-report measures. In line with this, measuring how people "usually" think is also a difficult concept to capture. I recognize that it might be difficult to be able to reflect on how one normally thinks and that some participants may not be able to do so. A future directory might therefore be to design a study that better captures their way of thinking by giving participants more concrete scenarios or tasks.

In the present research, I measured self-regulation success based on goal achievement and goal commitment scores on only two everyday goals. I recognize that this is a simplified way of assessing self-regulation that might not perfectly reflect actual self-regulation success. In addition to this, both exercise and food consumption behavior have been found to be influenced by other factors such as emotion regulation, dopamine reward, and stress management (Adam & Epel, 2007; Jones, 2022). These factors add to the complexity of measuring self-regulation success for the goal of eating healthy and being physically active. An interesting future direction would be finding the moderation effect of vividness of visual imagery between situational cue-thought planning and actual self-regulatory success, possibly by using a similar task design to Kristiansen et al. (2023).

Another limitation of this study might be the sample of participants. This is because participants in this study were mainly recruited through e-mail lists from a Norwegian university. Thus, I expect that most of our participants are university students. This may affect the effects seen, as one can argue that university students may have a higher level of conscientiousness compared to the general population. In the future, it would be beneficial for research to replicate these findings across more diverse populations.

Further, to fit the format of my survey, I decided to adapt all scales in this survey to a likert scale with the values 1-7. The exception was for the HEVS healthy eating and the IPAQ

physical activity. Here, the likert scale ranged from 0-7. This change of scale was done mainly with the participants in mind, arguing that having several questionnaires with different answering scales would be confusing. However, this change might have affected the original validity of the scales. In line with this, all the questionnaires were translated from English to Norwegian. Although much time and consideration were used to translate the questions as accurately as possible, I cannot dismiss the possibility that translating questionnaires could affect their validity and/or reliability.

Additionally, a prominent limitation of this study was the use of the HEVS scale. This scale did not reach a statistically acceptable Cronbach's alpha value of at least 0.65. This again caused me to have to deviate from the original pre-registered method. The fact that the HEVS scale lacked internal consistency meant that I could not put too much emphasis on the results from the moderation model that included this scale. Lastly, the design of this study was correlational which means that there can be drawn no causal conclusions from this research, only relationships between the different concepts have been found.

Conclusion

To conclude, this research firstly strengthens the prior findings that there is a relationship between situational cue-thought planning and conscientiousness. Further, it highlights the importance of considering how individual differences such as vividness of visual imagery might influence the effectiveness of situational cue-thought planning, and thus, self-regulatory success. Visual imagery was found to have a trend with situational cue thought planning in both studies. In addition, it acted as a moderator for the relationship between situational cue-thought planning and self-regulation.

A higher level of vividness of visual imagery was associated with a stronger relationship between these two variables for people with low goal commitment, but not for people with high goal commitment. I therefore propose that vividness of visual imagery might

be a prerequisite for the effectiveness of situational cue-thought planning when used for novel behavior that must be consciously planned. Future research on the effect of implementation intentions and situational cue-thought planning might benefit from taking into consideration how individual differences such as visual imagery might impact the effectiveness of these planning strategies.

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Appendix A

Information to Participants in Study One

This study investigates the relationship between personality traits and the way people reach their goals. We will also investigate how this might relate to the level of detail one has when imagining scenarios in their mind. The results from this survey are going to be used for a master's thesis which might be published. UiT- The Arctic University of Norway, Department of Psychology is responsible for this project (data controller). We are recruiting people over the age of 18.

The study consists of an online survey with 4 different questionnaires. The survey includes questions about how you think when making plans, personality traits, and visualization of images. Participation is voluntary and the answers and information you share will be stored anonymously and can therefore not be traced back to you in any way. You can withdraw at any point during the study by closing the browser tab.

The study will take about 15 minutes to complete, and we ask you to answer as sincerely as possible. When you complete the study there will be a link to where you can enter your e-mail address and participate in a lottery to win one of two gift cards of 500 kr. The participation in the lottery is registered on another page so that your e-mail will not be linked to your answers.

This study is conducted by Kristin Bjørkhaug Johansen at UiT–The Arctic University of Norway, Department of Psychology. The supervisor for this project is Torsten Martiny-Huenger. If you have questions about the study, you can contact kjo186@uit.no.

By checking the boxes below, you consent to participating in this study:

☐ I consent to participating in this study.

☐ I have read the information above and understand the purpose of this study. I

understand my right to withdrawal.

☐ I am 18 years old or older.

Appendix B

Information to Participants in Study Two

This study investigates the relationship between personality traits and the way people reach their goals. We will also investigate how this might relate to the level of detail one has when imagining scenarios in their mind. The results from this survey are going to be used for a master's thesis which might be published. UiT- The Arctic University of Norway, Department of Psychology is responsible for this project (data controller). We are recruiting people over the age of 18.

The study consists of an online survey with 6 different questionnaires. The survey includes questions about how you think when making plans, personality traits, and visualization of images. Some of the questions will concern eating habits in the last week. If you find questions about food triggering in any way, or you believe that questions about food intake may be a sensitive topic for you, then we advise you not to take part in the study. Participation is voluntary and the answers and information you share will be stored anonymously and can therefore not be traced back to you in any way. You can withdraw at any point during the study by closing the browser tab.

The study will take about 20 minutes to complete, and we ask you to answer as sincerely as possible. When you complete the study there will be a link to where you can enter your e-mail address and participate in a lottery to win one of two gift cards of 500 kr. The participation in the lottery is registered on another page so that your e-mail will not be linked to your answers.

This study is conducted by Kristin Bjørkhaug Johansen at UiT–The Arctic University of Norway, Department of Psychology. The supervisor for this project is Torsten Martiny-Huenger. If you have questions about the study, you can contact kjo186@uit.no.

By checking the boxes below, you consent to participating in this study:

☐ I consent to participating in this study.

☐ I have read the information above and understand the purpose of this study. I understand my right to withdrawal.

☐ I am 18 years old or older.

Appendix C

Cue-Thought Habit Questionnaire Items

‘’When thinking about future actions, thinking about specific situations where I can do that action is something ...”

1. I rarely do.
2. I do every day.
3. I have been doing for a long time.
4. I would need to be reminded to do.
5. I start doing before I realize I’m doing it.
6. I would find hard to do.
7. That feels sort of natural to me.
8. That is not typically me.

Response scale: Likert scale ranging from 1-7 where 1 is “totally disagree” and 7 is “totally agree”.

Appendix D

Mini-IPIP Conscientiousness Subscale Items

1. I get chores done right away.

2. I often forget to put things back in their proper place.

3. I like order.

4. I make a mess of things.

Response scale: Likert scale ranging from 1-7 where 1 is “totally disagree” and 7 is “totally agree”.

Appendix E

Vividness of Visual Imagery Questionnaire Items

For items 1-4, think of some relative or friend whom you frequently see (but who is not with you at present) and consider carefully the picture that comes before your mind's eye.

1.The exact contour of face, head, shoulders and body.

2. Characteristic poses of head, attitudes of body, etc.

3. The precise carriage, length of step, etc., in walking.

4. The different colours worn in some familiar clothes.

Visualize a rising sun. Consider carefully the picture that comes before your mind's eye.

5. The sun is rising above the horizon into a hazy sky.

6. The sky clears and surrounds the sun with blueness.

7. Clouds. A storm blows up, with flashes of lightning.

8. A rainbow appears.

Think of the front of a shop which you often go to. Consider the picture that comes before your mind's eye.

9. The overall appearance of the shop from the opposite side of the road.

10. A window display including colours, shapes and details of individual items for sale. 11. You are near the entrance. The color, shape and details of the door.

12. You enter the shop and go to the counter. The counter assistant serves you. Money changes hands.

Finally, think of a country scene which involves trees, mountains and a lake. Consider the picture that comes before your mind's eye.

13. The contours of the landscape.

14. The color and shape of the trees.

15. The color and shape of the lake.

16. A strong wind blows on the trees and on the lake causing waves

Response scale: 7-point likert scale that ranges from 1-7 where 1 is ‘ Perfectly clear and as vivid’ and 7 is ‘No image at all’.

Appendix F

Daydreaming Frequency Scale Items

1. I daydream...

Response scale: 7 point likert scale ranging from 1. 'Infrequently' to 7. 'Many times a day'.

2. Daydreams and fantasies make up...

Response scale: 7 point likert scale ranging from 1. '0% of my thought for the day' to 7 'At least 50% of my thoughts for the day.'

3. As regards daydreaming, I would characterize myself as someone who...

Response scale: 7 point likert scale ranging from 1. 'Never daydreams' to 7. 'Is an inveterate daydreamer'.

4. I recall or think over my daydreams...

Response scale: 7 point likert scale ranging from 1. 'Infrequently' to 7. 'Many times a day'.

5. When I am not paying attention to some job, book, or TV, I tend to be daydreaming...

Response scale: 7 point likert scale ranging from 1. '0% of the time' to 7. '75% of the time'.

6. Instead of noticing events or people or people in the world around me, I will spend approximately...

Response scale: 7 point likert scale ranging from 1. '0% of my time lost in my thoughts' to 7. 'At least 50% of my time lost in my thoughts'.

7. I daydream at work or at school...

Response scale: 7 point likert scale ranging from 1. 'Infrequently' to 7. 'Many times a day'.

8. Recalling things from the past, thinking of the future, or imagining unusual kinds of events occupies...

Response scale: 7 point likert scale ranging from 1. ‘0% of my thought for the day’ to 7. ‘At least 50% of my thoughts for the day’.

9. I lose myself in active daydreaming...

Response scale: 7 point likert scale ranging from 1. ‘Infrequently’ to 7. ‘Many times a day’.

10. Whenever I have time on my hands, I daydream...

Response scale: 7 point likert scale ranging from 1. ‘Never’ to 7. ‘Always’.

11. When I am at a meeting or show that is not very interesting, I daydream rather than pay attention...

Response scale: 7 point likert scale ranging from 1. ‘Never’ to 7. ‘Always’.

12. On a long bus, train, or airplane ride I daydream...

Response scale: 7 point likert scale ranging from 1. ‘Never’ to 7. ‘Most of the time’.

Appendix G

Goal Commitment Scale 1

Goal: Eating Healthy

1. It's hard to take this goal seriously.

2. It's unrealistic for me to expect to reach this goal.

3. It is quite likely that this goal may need to be revised, depending on how things go.

4. Quite frankly, I don't care if I achieve this goal or not.

Response scale: Likert scale ranging from 1-7 where 1 is “totally disagree” and 7 is “totally agree”.

Appendix H

Goal Commitment Scale 2

Goal: Being physically active

1. It's hard to take this goal seriously.

2. It's unrealistic for me to expect to reach this goal.

3. It is quite likely that this goal may need to be revised, depending on how things go.

4. Quite frankly, I don't care if I achieve this goal or not

Response scale: Likert scale ranging from 1-7 where 1 is “totally disagree” and 7 is “totally agree”.

Appendix I

International Physical Activity Questionnaire

"We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Include only physical activity and planned training. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time."

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
2. How much time did you usually spend doing vigorous physical activities on one of those days? Think about all the moderate activities that you did in the last 7 days. (0 = None, 1 = 0 - 30 min, 2 = 30 - 60 min, 3 = 1 - 1,5 hours, 4 = 1,5 - 2 hours, 5 = 2 - 2,5 hours, 6 = 2,5 - 3 hours, 7 = More than 3 hours).

Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
4. How much time did you usually spend doing moderate physical activities on one of those days? (0 = None, 1 = 0 - 30 min, 2 = 30 - 60 min, 3 = 1 - 1,5 hours, 4 = 1,5 - 2 hours, 5 = 2 - 2,5 hours, 6 = 2,5 - 3 hours, 7 = More than 3 hours).

Response scale: 8-point likert scale ranging from 0 – 7.

Appendix J

The Healthy Eating Vital Signs (HEVS)

1. How many times did you eat restaurant or fast food last week? (For example McDonald's, Burger King, etc.)

2. How many times do you typically eat restaurant or fast food in one week (7 days)?

3. How many cans of non-diet soda pop did you drink yesterday? (For example Coke, Pepsi, Sprite)

4. How many cans do you typically drink non-diet soda pop in one day?

5. How many times did you drink healthy juice yesterday? (For example orange juice, apple juice)

6. How many times do you typically drink healthy juice in one day?

7. How many times did you eat vegetables yesterday? (For example carrot, bell pepper, salad, etc.)

8. How many times do you typically eat vegetables in one day?

9. How many times did you eat fruit yesterday? (For example an apple, an orange, a handful of grapes, etc.)

10. How many times do you typically eat fruit in one day?

11. How many times do you typically eat breakfast in one week (7 days)?

12. When eating restaurant food or fast food, do you eat all of the food served to you at one time?

Response scale questions 1 – 11: 8-point likert scale ranging from 0 – "7 or more".

Response scale question 12: 7-point likert scale ranging from "Never" to "Always".

Appendix K

Additional Questions

1. I believe I understood what was meant by thinking about *future actions*.

2. I believe I understood what was meant by thinking about future actions in a format that included *situations* in which the action could be performed.

Response scale: Likert scale ranging from 1-7 where 1 is “totally disagree” and 7 is “totally agree”.

3. Please do not answer this question, leave the scale unmarked and continue with the "Year of birth" question. (Attention check item)

Response scale: 7-point scale, anchors “Disagree” and “Agree”

4. Year of birth: [text field]

5. Gender [options: “Female”, “Male”, “Other”, “Would rather not answer”]

Appendix L

Table L1

Moderation analysis including combined scores for goal commitment and scores on HEVS healthy eating and IPAQ physical activity

Effect	Estimate	SE	95% CI		*p*
			LL	UL	
Fixed effects					
Intercept	–.02	.09	–0.19	0.15	.82
Cue-though	–.05	.09	–0.22	0.13	.60
Vividness	–.01	.09	–0.18	0.16	.91
Goal commitment	.42	.09	0.25	0.60	< .001
Int 1	.13	.06	0.01	0.26	.04
Int 2	–.15	.09	–0.32	0.03	.11
Int 3	.17	.08	0.02	0.31	.03
Int 4	–.11	.05	–0.22	–0.01	.04

Note. N = 114, Int 1 = Cue- Thought X Vividness, Int 2 = Cue-Thought X Goal Commitment, Int 3 = Vividness X Goal Commitment, Int 4 = Cue-Thought X Vividness X Goal Commitment.

Table L2

Moderation analysis including IPAQ physical activity scores as a goal achievement measure

Effect	Estimate	SE	95% CI		*p*
			LL	UL	
Fixed effects					
Intercept	–.02	.08	–0.18	0.14	.83
Cue-though	–09	.08	–0.26	0.07	.28
Vividness	.00	.09	–0.17	0.17	.99
Goal commitment	.50	.09	0.34	0.67	<.001
Int 1	.15	.07	0.02	0.28	.03
Int 2	–.09	.08	–0.25	0.07	.25
Int 3	.14	.08	–0.01	0.30	.07
Int 4	–.10	.05	–0.20	0.01	.07

Note. N = 114, Int 1 = Cue- Thought X Vividness, Int 2 = Cue-Thought X Goal Commitment, Int 3 = Vividness X Goal Commitment, Int 4 = Cue-Thought X Vividness X Goal Commitment.

Table L3

Moderation analysis including HEVS healthy eating scores as a goal achievement measure

Effect	Estimate	SE	95% CI		*p*
			LL	UL	
Fixed effects					
Intercept	.00	.10	–0.19	0.19	.97
Cue-though	.16	.10	–0.03	0.35	.11
Vividness	–.07	.10	–0.27	0.12	.47
Goal commitment	.15	.10	–0.05	0.34	.14
Int 1	.01	.07	–0.14	0.15	.91
Int 2	–.09	.10	–0.28	0.09	.32
Int 3	.06	.09	–0.13	0.24	.56
Int 4	–.04	.07	–0.18	0.11	.62

Note. N = 114, Int 1 = Cue- Thought X Vividness, Int 2 = Cue-Thought X Goal Commitment, Int 3 = Vividness X Goal Commitment, Int 4 = Cue-Thought X Vividness X Goal Commitment.