

**The Relationship between Motivation and Mind Wandering: Learning Strategies as a  
Mediator**

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**Abstract**

Students in tertiary education can experience negative mind wandering, defined as task-unrelated thought, during their individual study time. This can disrupt their focus and reading comprehension. Previous studies found that students' level of motivation is related to their mind wandering. Additionally, it is found that the level of students' motivation affects their use of learning strategies, as previous studies about the reduction of mind wandering have found methods that are similar to learning strategies. This study investigates if the relation between students' motivation and their mind wandering is mediated through the use of learning strategies. Furthermore, this study examines which specific learning strategy plays a mediating role in the relationship between motivation and mind wandering. The data were collected from students in tertiary education in the Netherlands. The students' mind wandering, motivation, and use of learning strategies are measured by existing questionnaires. The results showed that the relation between motivation and mind wandering is fully mediated through learning strategies. The strategies of time and study management, effort regulation, and help seeking appear to mediate the relationship between motivation and mind wandering. Concluding, the use of learning strategies forms an explanation for the relation between motivation and mind wandering. However, further research should be done to examine if promoting the learning strategies has an impact on student's performance.

*Keywords:* Mind Wandering, Motivation, Learning Strategies

## Motivation, Mind Wandering, and Mediator Learning Strategies

Students in tertiary education spend much of their time studying independently and reading course materials as it is expected that they are responsible for their own learning process (Hartikainen et al., 2019). In comparison with students in secondary or primary education, these students spent a lot of their time studying individually. Especially the Covid-19 pandemic caused many situations where students were forced to study alone (Hermanto et al., 2021). During study time, it can be difficult to stay focused on the task at hand. While studying, students may experience unintentional mind wandering as their eyes skim the words without comprehending the content of the material (Smallwood, 2011). The mind of students can wander to matters that are important for the study course, but they can also wander to irrelevant topics. Many students experience negative mind wandering, where their thoughts flow away from the task. This negative mind wandering disrupts reading comprehension and can have negative consequences on the student's learning achievements (Desideri et al., 2018).

To identify ways to reduce the amount of mind wandering, studies have tried to find causes and stimulators of mind wandering. Previous studies have found a relationship between students' motivation and mind wandering, as these can both affect task performance (Brosowsky et al., 2020; Kawagoe et al., 2020). These findings suggest that a predictor of mind wandering is the level of students' motivation. While the association between motivation and mind wandering is clear, the details of how motivation affects students' mind wandering are still unknown. The use of learning strategies is suggested as a mediator in this relationship because there is a clear association between motivation and learning strategies (El-Adl & Alkharusi, 2020; Rashid & Rana, 2019). Moreover, learning strategies have similarities to methods that have been found to reduce mind wandering (Massonnié et al., 2020; Mrazek et al., 2020; Varao-Sousa et al., 2019). This study aims to investigate whether the utilization of learning strategies can explain the relationship between students' motivation

## Motivation, Mind Wandering, and Mediator Learning Strategies

and mind wandering. With that, the results could potentially provide a step towards finding a solution to reduce negative experiences of mind wandering. Additionally, this study explores which particular learning strategies act as mediators in the relationship between motivation and mind wandering.

### **Mind Wandering**

In the last decade, the mind wandering concept has received significant attention. Much research has been invested in understanding the nature of this multidimensional topic (e.g., Christoff et al., 2016; Mooneyham & Schooler, 2013; Seli et al., 2017; Smith et al., 2022). Mind wandering refers to the redirection of attention from an ongoing task toward internal thoughts and feelings (Bonifacci et al., 2022). Terms such as *self-generative thought* and *spontaneous thought* are related to the concept of mind wandering (Kawagoe et al., 2020).

Several views construct the way mind wandering is represented. The first and most frequently used term to define mind wandering is *task-unrelated* thought, which involves the disengagement of thoughts from the primary task at hand (Bonifacci et al., 2022; Seli et al., 2016). However, researchers found that more divisions can be made between specific thoughts in the concept of mind wandering (Irving et al., 2020; Smith et al., 2022). Views such as *stimulus-independent thought* (Smallwood & Schooler, 2015), *unintentional thought* (McVay & Kane, 2010; Waltz, 2017) and *dynamically unguided thought* (Christoff et al., 2016; Irving, 2016; Mills et al., 2018) explain the different types of mind wandering. These views differ in what the mind wandering thoughts contain. The definition of mind wandering as *task-unrelated thought* contains all the experiences of mind wandering, no matter the contents of the thoughts. As students can experience negative consequences of every form of mind wandering, this study uses the definition of *task-unrelated thought* to describe the concept.

While research has found positive effects of task-unrelated mind wandering on cognitive performance, like creative thinking (Baird et al., 2012), students are more likely to experience the costs and the negative effects of mind wandering (Mooneyham & Schooler, 2013). Mind wandering can result in a disruption of performance (Kawagoe et al., 2020), and can negatively affect students learning achievements (Desideri et al., 2018). Moreover, students can experience the most negative consequences of mind wandering in reading comprehension (Bonifacci et al., 2022). It is crucial for students in tertiary education to have a deep understanding of the written text while studying, without the disturbance of mind wandering. Therefore, it is important to investigate what factors could reduce mind wandering with students.

### **How Can Motivation Reduce Mind Wandering?**

Motivation can be described as the process, in which activities aimed at achieving goals are initiated and maintained (Cook & Artino, 2016). Previous theories focused on biological instincts and drives, but more recent theories describe cognitive and social processes that influence students' motivation and guide actions (Fulmer & Frijters, 2009). This study focuses on the cognitive view by including three components that are often used to measure motivation. These components are *value*, *expectancy*, and *affective* (Pintrich et al., 1991). The components include the students' intrinsic and extrinsic motivation, task value, control beliefs, self-efficacy for learning, and anxiety about tests. These components measured together provide a clear view of the student's motivation (Pintrich et al., 1993).

While mind wandering is an unintentional process, several studies have found that increasing students' motivation to perform well could significantly reduce mind wandering (Brosowsky et al., 2020; Kawagoe et al., 2020; Seli et al., 2017, 2020). During the task, motivated students tend to experience less mind wandering. This suggests that motivation-based methods could be beneficial for the reduction of students' mind wandering. The exact

## Motivation, Mind Wandering, and Mediator Learning Strategies

cause of why students' motivation affects mind wandering is still unknown. Therefore it is necessary to further investigate the relationship between students' motivation and mind wandering.

Motivated students actively engage in their learning process, assuming an active role. This especially occurs in the self-regulated learning process (Hofmann & Milyavskaya, 2018; Panadero, 2017). With self-regulated learning, students are focused on reaching their goals and students' motivation plays an integral role in this process. For students to have a successful self-regulated learning process, the use of learning strategies is crucial (Cho & Heron, 2015). Different studies have established that motivation plays a key role in students' adoption of learning strategies within the context of self-regulated learning. A recent study by El-Adl and Alkharusi (2020) found that motivated students are more likely to use learning strategies as they have more control over their self-regulated learning process. In addition, it is found that the motivational beliefs of students are associated with their use of learning strategies and that the use of most of the learning strategies might improve students' academic performance (Rashid & Rana, 2019). These outcomes suggest that students' motivation is associated with the use of learning strategies. With this in mind, it is interesting to see if students' motivation and their use of learning strategies can be related to their mind wandering.

### **Learning Strategies as a Mediator in the Relation between Motivation and Mind Wandering**

Learning strategies can be defined as combinations of activities that students can use in their learning process that can support the understanding and transfer of skills and knowledge (Chamot, 2004). Additionally, learning strategies can include the students' mental processes and actions to reach certain learning goals (Weinstein et al., 2000). Learning

## Motivation, Mind Wandering, and Mediator Learning Strategies

strategies are dynamic and can be developed by students in a short period of time to achieve learning goals (Zlatović et al., 2015).

Two categories are described that contain nine different learning strategies. The first category includes cognitive and metacognitive strategies “*Rehearsal, elaboration, organization, critical thinking, and metacognitive self-regulation*” (Pintrich et al., 1991, pp. 18-24). Students can use the strategies to repeat information, summarize, select useful information, make decisions, and set goals. These strategies could play a role in the mediation between motivation and mind wandering as previous studies found that attention training can help students reduce mind wandering (Mrazek et al., 2020). Attention training has similarities with the use of cognitive and metacognitive strategies because they both help students to focus on the task at hand and control their cognitive processes.

The second category contains resource management strategies “*Time and study environment, effort regulation, peer learning, and help-seeking*” (Pintrich et al., 1991, pp. 25-29). Students use these strategies as they schedule study time, learn self-management, collaborate with peers, and seek guidance. These strategies could be effective in the reduction of mind wandering as they can help students to choose a suitable environment with the right people to study. Previous studies found that noise in a classroom or studying together with other students could affect the students’ mind wandering and negatively influence their learning experience (Massonnié et al., 2020; Varao-Sousa et al., 2019).

To summarize, it is known that students’ motivation can affect their mind wandering. It is interesting to investigate this relationship further as the details of this association are not clear. The relation between motivation and mind wandering may be attributed to the utilization of learning strategies by students, although this remains uncertain. This study aims to create clarity in this relationship. Furthermore, the learning strategies can be divided into

## Motivation, Mind Wandering, and Mediator Learning Strategies

two categories and nine strategies. It is yet unknown which learning strategies mediate the relationship between motivation and mind wandering.

### **The Present Study**

This study will investigate if the relation between students' motivation and their experience of mind wandering is mediated through the use of learning strategies.

Additionally, this study will explore which specific learning strategy plays a mediating role in the relationship between motivation and mind wandering. This research contributes to the literature about reducing mind wandering as it can create a more clear view of the causes and stimulators of mind wandering with students in tertiary education. This study can also support the development of methods to reduce mind wandering. In previous research, the association between students' motivation and mind wandering is found (Brosowsky et al., 2020; Kawagoe et al., 2020; Seli et al., 2017, 2020). Furthermore, it is known that there is an association between motivation and the use of learning strategies through the process of self-regulated learning. (Cho & Heron, 2015; El-Adl & Alkharusi, 2020; Rashid & Rana, 2019). However, there has been no research on the association between students' use of learning strategies and mind wandering. As the learning strategies have similarities with methods that are already found to reduce mind wandering (Massonnié et al., 2020; Mrazek et al., 2020; Varao-Sousa et al., 2019), it is interesting to investigate which learning strategies specifically are associated with mind wandering.

The aim of this study is to answer the following research question: To what extent is the relation between motivation and mind wandering mediated through the use of learning strategies?

It is hypothesized that students who experience a high level of motivation towards their study, will perform more learning strategies and therefore experience less mind wandering during their study time. Specifically, it is hypothesized that the students who



## Motivation, Mind Wandering, and Mediator Learning Strategies

implement the learning strategies in the category of cognitive and metacognitive strategies will experience less mind wandering as they are consciously working to stay focused on the task at hand. Students who implement the strategies in the category of resource management strategies will also experience less mind wandering. This is because they deliberately try to find the best study environment and therefore avoid distractions.

The level of motivation and the use of learning strategies will be measured by the validated Dutch Motivated Strategies for Learning Questionnaire (MSLQ), which includes three components of motivation and two categories of learning strategies (Blom & Severiens, 2008; Pintrich, et al., 1991). Mind Wandering Questionnaire (MWQ) will measure the construct of mind wandering in this study (Mrazek et al., 2013).

## Methods

### Design

In this study, quantitative data were collected in the form of an online survey. The construct of the independent variable motivation, the dependent variable mind wandering and the mediator learning strategies were measured in the survey using existing questionnaires. This design was used to rapidly gather data from a substantial number of participants, facilitating efficient data collection.

### Participants

The final sample consisted of 102 students (63 males; 38 females; 1 other). From the 135 questionnaires, 33 had to be eliminated from the dataset as the participants did not complete the survey. The participants in this research were students between the age of 17 and 30 ( $M = 19$ ;  $SD = 3,7$ ) and were following a bachelor's or master's program in tertiary education in the Netherlands. In the sample, 68 % of the students followed a mbo course, 14 % a hbo bachelor course, 5 % a wo bachelor course, and 13 % a master's course. Prior to the survey, the participants read the information letter and agreed to the terms with an informed

## Motivation, Mind Wandering, and Mediator Learning Strategies

consent in which the privacy and anonymity of participants were guaranteed. The participants also gave their consent to include their data in the research (see Appendix A). The participants were not rewarded for participating in the online survey.

### **Instruments**

#### ***Motivation***

In this study, the motivation of students was measured by conducting the Motivated Strategies for Learning Questionnaire (MSLQ). This survey contained three components of motivation: *value component*, *expectancy component*, and *affective component* (Pintrich, et al., 1991). This instrument was chosen as it has been commonly applied in previous research to study motivation and learning strategies (Credé & Phillips, 2011). The survey was adjusted to the current study by using the validated Dutch version of the MSLQ (Blom & Severiens, 2008). The three motivation components of this instrument were divided into six sub-scales and contained 33 items (see Appendix B). The MSLQ used a seven-point Likert scale to grade the items, where zero meant “not true for me at all” and seven meant “very true for me”.

A CFA was conducted to examine the construct validity of the motivation components in the MSLQ. The CFA was conducted in RStudio and specified the three components in the model. With the first CFA, one item showed a low factor loading (.005) and for this reason, the item was removed. After deleting the item Control belief 4, the CFA was conducted again. The goodness-of-fit test and fit measures were slightly improved ( $p = <.001$ , CFI = .77, TLI = .75, RMSEA = .09). The questionnaire without the deleted item was used for further analysis. The Cronbach's  $\alpha$  coefficient for the motivation scale without the deleted item is considered sufficient ( $\alpha = .85$ ). The Cronbach's  $\alpha$  coefficient for the separate components can be found in Table 1 and can be considered adequate based on the COTAN-criteria (Evers et al., 2015).

**Table 1***Reliability of Motivation Components of the MSLQ*

	Component	Nr. of sub-scales	Nr. of statements	Cronbach's $\alpha$
Motivation Scale	Value	3	15	.85
	Expectancy	2	13	.87
	Affective	1	5	.90

*Learning Strategies*

The construct of learning strategies was also measured in this study by the MSLQ from Pintrich et al. (1991). In this instrument, the nine learning strategies were divided into the cognitive and metacognitive strategies category, and resource management strategies category. The validated Dutch version of the MSLQ was used in this study because the revision of the scales had led to sufficient reliability (Blom & Severiens, 2008). The scale of the learning strategies in the validated Dutch MSLQ contained 54 items (see Appendix B). A seven-point Likert scale was used to grade the items in the MSLQ. On this scale, zero meant “not true for me at all” and seven meant “very true for me”. The item Metacognitive self-regulation 1 was removed for the theoretical reason that this item was too closely related to the dependent variable mind wandering.

A CFA was conducted to examine the construct validity of the learning strategy construct in the MSLQ. The nine strategies were specified in the CFA. The goodness-of-fit test and fit measures were insufficient ( $p = <.001$ , CFI = .70, TLI = .68, RMSEA = .08). No further items were deleted and the current questionnaire was used in further analysis. The Cronbach's  $\alpha$  coefficient for the learning strategies scale without the deleted item is sufficient ( $\alpha = .94$ ). The Cronbach's  $\alpha$  coefficients for the different strategies in the learning strategies scale can be considered sufficient based on the COTAN-criteria (Evers et al., 2015), and can be found in Table 2.

**Table 2***Reliability of Learning Strategies in the MSLQ*

	Category	Strategy	Nr. of statements	Cronbach's $\alpha$
Learning Strategies Scale	Cognitive and metacognitive strategies	Rehearsal	5	.89
		Elaboration	7	.72
		Organization	7	.85
		Critical thinking	5	.73
		Metacognitive self-regulation	8	.74
	Resource management strategies	Time & study environment	7	.82
		Effort regulation	5	.77
		Peer learning	6	.82
		Help seeking	3	.83

***Mind Wandering***

To measure the *task-unrelated thought* of mind wandering, the Mind Wandering Questionnaire (MWQ) by Mrazek et al. (2013) was used in this study (see Appendix C). The MWQ contained five items that could be graded with a six-point Likert scale where one meant “almost never” and six meant “almost always”. The MWQ included items such as “While reading, I find I haven’t been thinking about the text and must therefore read it again”. This scale has been frequently used in previous research about mind wandering and has shown good reliability (e.g., Kawagoe et al., 2020; Mrazek et al., 2013). To check the construct validity of the MWQ, a CFA was conducted. The goodness-of-fit test and fit measures were considered sufficient ( $p = .890$ , CFI = 1.00, TLI = 1.03, RMSEA = .00). All factor loadings of the model were higher than 0.7 which is sufficient considering the COTAN-criteria (Evers et al., 2015), thus no items were deleted. The Cronbach's  $\alpha$  coefficient for the MWQ in this study is considered sufficient ( $\alpha = .87$ ).

**Procedure**

The participants entered the survey by clicking on the link to the online survey. The link to the online survey was shared in the network of the researchers. The participants could

### Motivation, Mind Wandering, and Mediator Learning Strategies

use their own devices to fill in the survey and they were able to complete it in their own time. The participants were able to pause or exit the survey at any point in time. Before entering the survey, the participants read the information letter and filled in the informed consent. When the terms of this research were accepted, the participants could begin with the first part of the survey. The data for this study was collected in combination with another study. The first construct in the survey was about the symptoms of ADHD and was part of the other study. This construct was not used in the current study. The following construct was the mind wandering construct. The third construct contained randomized components of the learning strategies and the motivation construct. This particular order was determined as the participants would start with the shorter parts and finish with the longer parts of the survey. The survey took approximately 20 to 30 minutes to complete.

### **Data-analysis**

Before analyzing the data, the assumptions of the mediation analysis were checked. The dependent, independent, and mediator variables were a continuous scale. A scatterplot was made to check the linear relationship between the variables. No outliers were found and the data did not show multicollinearity. Furthermore, new variables for the independent, the dependent, and the mediator were made by considering the mean score of the selected items in the constructs. Similarly, new variables were made of the two categories and the nine learning strategies. These new variables were used in further analyses. The correlations between the variables were measured to examine the associations.

To answer the research question, the mediation analysis was performed using PROCESS model number 4 in SPSS (Hayes, 2022). First, it was investigated if there was a significant relation between the independent variable motivation and the dependent variable mind wandering. A simple linear regression analysis was performed to estimate the total effect between the two variables. When the relation between these two variables was

## Motivation, Mind Wandering, and Mediator Learning Strategies

confirmed by a significant effect, the mediation analysis can be performed. In the first step of the mediation analysis, the relation between the independent variable and the mediator was determined. Secondly, the relation between the mediator and the dependent variable was examined. Finally, the total, direct, and indirect effects of the mediation were examined. By interpreting this information, it was possible to determine if a full or partial mediation took place. Lastly, the data were interpreted more precisely by examining the correlations and conducting eleven mediation analyses with the two categories and the nine separate learning strategies. This was done to explore the relation between motivation and mind wandering further with the specific learning strategies as mediators.

## Results

### Descriptives Statistics

The means, standard deviations, and minimum and maximum scores of the constructs are described in Table 3. The motivation and learning strategies construct used a seven-point Likert scale, and the mind wandering construct used a six-point Likert scale. Furthermore, the correlations between the variables are given. These results showed a positive relation between motivation and learning strategies. The students with high motivation correspond with high use of learning strategies. A negative relation between motivation and mind wandering and between learning strategies and mind wandering was found. Students with high motivation or high use of learning strategies correspond with a low amount of mind wandering.

**Table 3**

*Descriptive statistics and correlations per variable*

	M	SD	Min	Max	1	2	3
1 Motivation	3.8	1.0	2.9	5.9	-		
2 Learning Strategies	4.2	0.8	1.9	5.7	.69**	-	
3 Mind Wandering	4.6	0.6	1	6	-.21*	-.35**	-

*Note.* \*  $p < .05$ . \*\*  $p < .001$ .

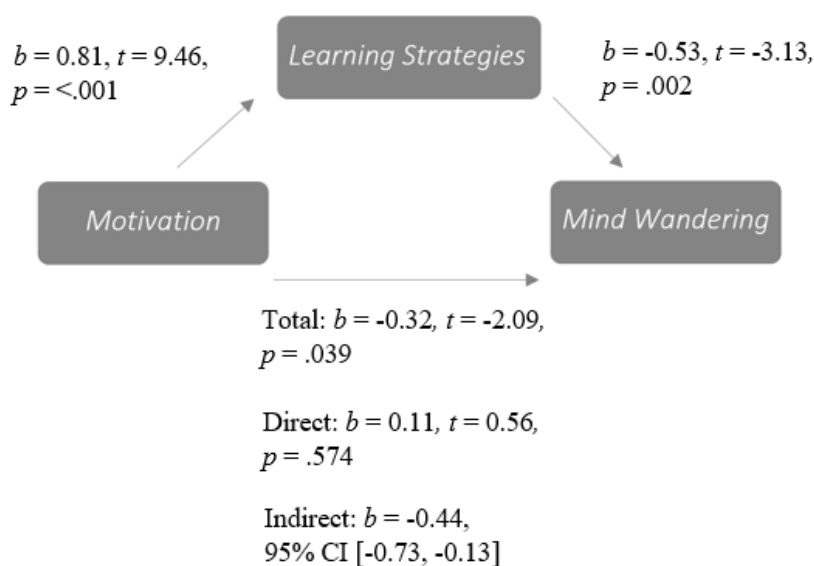
### **Mediation Analysis**

In the first step of the mediation analysis, the relation between the independent and the dependent variable was examined. After all the assumptions were checked and found acceptable, the regression analysis was conducted. A simple linear regression showed a significant relationship between motivation and mind wandering,  $F(1,100) = 4,24$ ,  $p = .039$ ,  $R^2 = .04$ .

The following step in the mediation analysis was performed with the use of model number 4 of PROCESS in SPSS (Hayes, 2022). See Figure 1 for the outcomes of the mediation analysis. The mediator contained the full construct of learning strategies. The mediation analysis showed a significant, positive relationship between motivation and learning strategies. The mediation also showed a significant, negative relation between learning strategies and mind wandering. The total effect described the relation between motivation and mind wandering, without considering the mediator learning strategies. This effect was, as mentioned above in the simple linear regression analysis, statistically significant. The direct effect contained the relation between motivation and mind wandering while considering the mediator learning strategies in the model. This effect was not significant. The indirect effect described the effect of motivation on mind wandering that is mediated through learning strategies. This effect was significant as there was no null in the LLCI and ULCI interval. This explained that there was a 95% chance that the null hypothesis was not in the interval. These results showed that a full mediation took place. The relationship between students' motivation and mind wandering is explained by their use of learning strategies.

**Figure 1**

*Model of Motivation and Mind Wandering Mediated through Learning Strategies.*



Note. CI = Confidence Interval

### Mediation Per Learning Strategy

Confirmation of the hypothesis that the relationship between motivation and mind wandering is mediated by learning strategies allows for a more in-depth investigation of this mediation process. The correlations between the nine learning strategies and the independent variable motivation, and the dependent variable mind wandering were examined. See Table 4. All learning strategies showed significant positive correlations with motivation and negative correlations with mind wandering. This suggested that motivated students reported using the learning strategies frequently and that the use of learning strategies corresponded with less experience of mind wandering. Specifically, the strategies of time and study environment, effort regulation, and help seeking showed significant correlations with mind wandering.



**Table 4**

*Descriptive Statistics and Correlations with Motivation and Mind Wandering Per Learning Strategy*

		M	SD	Motivation	Mind Wandering
1	Rehearsal	4.4	1.3	.49**	-.23*
2	Elaboration	4.3	0.8	.61**	-.21*
3	Organization	4.3	1.2	.50**	-.20*
4	Critical thinking	4.0	1.0	.35**	-.05
5	Metacognitive selfregulation	3.7	1.0	.49**	-.24*
6	Time & study environment	4.3	1.1	.57**	-.54**
7	Effort regulation	4.2	1.1	.46**	-.37**
8	Peer learning	3.9	1.2	.34**	-.02
9	Help seeking	4.7	1.3	.32**	-.37**

*Note.* \*  $p < .05$ . \*\*  $p < .001$ .

Mediation analyses with the two categories and the nine separate learning strategies were performed. See Table 5 for the outcomes of the mediation analyses. The mediation analysis with the category resource management showed a full mediation. Furthermore, the models with the learning strategies of time & study environment, effort regulation, and help seeking also showed a full mediation. These findings suggested that the relationship between students' motivation and mind wandering is explained by these specific learning strategies.

**Table 5**

*Mediation analyses of Motivation and Mind Wandering Mediated through the Learning Strategies.*

Mediator	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		<i>t</i> -statistics*	Conclusion
				Lower Bound	Upper Bound		
Cognitive & Metacognitive category	-0.32 ( <i>p</i> =.039)	-0.11 ( <i>p</i> =.582)	-0.21	-0.49	0.07	-0.55	No mediation
Resource Management category	-0.32 ( <i>p</i> =.039)	0.11 ( <i>p</i> =.530)	-0.43	-.68	-0.20	0.63	Full mediation
Rehearsal	-0.32 ( <i>p</i> =.039)	-0.19 ( <i>p</i> =.273)	-0.13	-0.36	0.04	-1.10	No mediation
Elaboration	-0.32 ( <i>p</i> =.039)	-0.19 ( <i>p</i> =.335)	-0.13	-0.37	0.10	-0.97	No mediation
Organization	-0.32 ( <i>p</i> =.039)	-0.22 ( <i>p</i> =.223)	-0.10	-0.30	0.11	-1.23	No mediation
Critical thinking	-0.32 ( <i>p</i> =.039)	-0.33 ( <i>p</i> =.046)	0.01	-0.10	0.12	-2.02	No mediation
Metacognitive self-regulation	-0.32 ( <i>p</i> =.039)	-0.18 ( <i>p</i> =.298)	-0.14	-0.37	0.03	-1.05	No mediation
Time & study environment	-0.32 ( <i>p</i> =.039)	0.25 ( <i>p</i> =.125)	-0.57	-0.83	-0.34	1.55	Full mediation
Effort regulation	-0.32 ( <i>p</i> =.039)	-0.07 ( <i>p</i> =.675)	-0.25	-0.50	-0.06	-0.42	Full mediation
Peer learning	-0.32 ( <i>p</i> =.039)	-0.35 ( <i>p</i> =.034)	0.03	-0.12	0.14	-2.15	No mediation
Help seeking	-0.32 ( <i>p</i> =.039)	-0.15 ( <i>p</i> =.321)	-0.17	-0.36	-0.04	-1.00	Full mediation

*Note.* \* Direct effect

## Discussion

## Motivation, Mind Wandering, and Mediator Learning Strategies

The aim of this study was to investigate whether the relationship between students' motivation and mind wandering is mediated by the use of learning strategies, as was hypothesized it could provide a plausible explanation for their association. In line with the expectations, the findings showed a relationship between motivation and mind wandering. Motivated students indicated that they experienced less mind wandering. Moreover, the mediation analysis showed that the relation between motivation and mind wandering was fully mediated through learning strategies. This implies that when students experience high motivation, they use more learning strategies and can experience less mind wandering. Specifically, the resource management category, and the time & study environment, effort regulation, and help seeking strategies showed a full mediation in the analyses. This suggests that these specific learning strategies are associated with the mind wandering of students and that they could be useful in further research about the reduction of mind wandering.

Previous studies found an association between motivation and mind wandering (Brosowsky et al., 2020; Kawagoe et al., 2020; Seli et al., 2017, 2020). This study focused on examining this connection more closely by investigating if the use of learning strategies could be a possible explanation for the relation between students' motivation and mind wandering. Previous studies indicated that the use of learning strategies could be a mediator because, in self-regulated learning, motivated students are more likely to use learning strategies (El-Adl and Alkharusi, 2020; Rashid & Rana, 2019). Furthermore, methods that have proven to be successful in reducing mind wandering have similarities to the learning strategies (Massonnié et al., 2020; Mrazek et al., 2020; Varao-Sousa et al., 2019). The results of this study showed a full mediation. These novel results are in line with the theoretical hypotheses. The full mediation with learning strategies can form an explanation for the relationship between students' motivation and their experience of mind wandering. This new information could be useful in further research about the reduction of mind wandering. As mind wandering

### Motivation, Mind Wandering, and Mediator Learning Strategies

specifically affects students' reading comprehension (Bonifacci et al., 2022), it could be interesting to investigate if students' motivation and their use of learning strategies could prevent a disruption in the reading process. A recent study (Trassi et al., 2019) found that learning strategies could be positively related to reading comprehension. Therefore, future research could investigate if the disruption in reading comprehension caused by mind wandering could be prevented by the use of learning strategies.

The mediation analyses with the specific learning strategies showed interesting results. In particular, the resource management category seemed to fully mediate the relation between motivation and mind wandering. All the strategies in this category, except for peer learning, equally showed a full mediation. These results suggest that the specific strategies could explain the relation between students' motivation and mind wandering. In line with the hypothesis, the strategy of time and study environment seemed to be a mediator in the relationship between motivation and mind wandering. The hypothesis was based on previous research about reducing mind wandering, where the findings suggested that the study environment was crucial for a successful learning experience (Massonnié et al., 2020; Varao-Sousa et al., 2019). The strategy of time and study environment contained actions that include making the right planning and finding a suitable study environment (Pintrich et al., 1991), and these actions could possibly be useful to prevent mind wandering. Furthermore, the results of the mediation analyses with the strategies of effort regulation and help seeking suggest a full mediation. These results indicate that self-management and seeking guidance could be beneficial for the reduction of mind wandering. Future research could investigate if stimulating these specific learning strategies could indeed reduce mind wandering and affect the student's performance.

It was hypothesized that all the learning strategies could be related to the relation between motivation and mind wandering, as they contain actions that students can implement

## Motivation, Mind Wandering, and Mediator Learning Strategies

to stay focused and reach goals (Weinstein et al., 2000). All of the mediating strategies share the characteristic of being classified within the resource management category. Within this particular category, students can use strategies that involve the regulation of various resources, excluding their own cognition. These resources include elements such as the study environment and guidance from others (Pintrich et al., 1991). The findings of this study suggest that the strategies that help students with regulating these resources can be important in the relation between students' motivation and their mind wandering. The strategies that include students' cognition and metacognition did not show a mediation in the analyses of this study. This suggests that students' cognition is not related to the relationship between motivation and mind wandering, which is a surprising result as motivation is a cognitive process (Fulmer & Frijters, 2009). The results seemed to show positive correlations between all the learning strategies and motivation. Additionally, all the learning strategies seemed to correlate negatively with mind wandering. These correlations indicate that there is some degree of relationship between the variables. However, the correlations between the variables do not imply that the learning strategies are mediators in the relationship between motivation and mind wandering (Hayes, 2022).

The finding that only a subset of individual learning strategies yielded significant mediation effects, whereas the full construct of learning strategies showed a complete mediation, suggests a potential explanation. It is plausible that the association between learning strategies and mind wandering manifests exclusively when these strategies are all used collectively. The individual strategies may have little effect, but when more strategies are used together, they could elevate the learning process. The results of this study contribute to the research into reducing negative mind wandering because it has clarified the relation between students' motivation and mind wandering. The identification of specific learning strategies within the mediation process could provide insights into which strategies could be

## Motivation, Mind Wandering, and Mediator Learning Strategies

advantageous for reducing mind wandering. The novel findings could establish a foundation for future research to explore the use of stimulating learning strategies in methods for reducing mind wandering.

### **Limitations**

A fundamental limitation of this study is that data collection relied solely on an observational survey. Therefore, it is not possible to establish causal relationships due to its reliance on data collected at a single point in time. This design does not facilitate the examination of changes over time. Future research could use other data collection designs, such as a longitudinal design, to investigate the changes and trends of motivation, learning strategies, and mind wandering over time. Moreover, the self-reported data in the survey may cause potential biases as this is a subjective method. This could be a limitation of this research as mental processes can be difficult for participants to recall. Specifically with the subject of motivation and mind wandering, it can be challenging for students to critically reflect on their past experiences (Weinstein, 2018). Future research could use other techniques for data collection that incorporate the possibility of participants' biases, such as objective research methods.

Another limitation of this study is that the majority of the participants, about 70%, indicated that they followed a mbo course. As this is a large part of the participants, this may not be a correct view of the population. This could also have a significant influence on the results, as the individual study time of these students is different from that of hbo or wo bachelor students. To create a more generalizable view, future studies are recommended to ensure an equally divided group of participants.

### **Implications**

The novel findings of this study indicate that the learning strategies create an explanation between students' motivation and mind wandering, which could be practically

### Motivation, Mind Wandering, and Mediator Learning Strategies

implemented by students and teachers. The specific strategies include the resource management of students. As this research found negative correlations between the use of learning strategies and mind wandering, it could be beneficial for teachers to support the utilization of learning strategies with students. The specific learning strategies that showed significant results in this study, such as the strategies in the resource management category, could possibly benefit students in their study time. Stimulating these strategies could support students in their learning process and therefore, possibly help them manage their mind wandering.

Future research can expand on the exploratory part of this study about the specific learning strategies. More research has to be done to confirm which particular learning strategies are associated with students' motivation and mind wandering. Furthermore, the effect of stimulating the learning strategies could be further investigated, in combination with the student's performance and reading comprehension.

In conclusion, this study provides evidence that the relation between students' motivation and mind wandering is fully mediated through the use of learning strategies. These novel findings add to the existing knowledge and provide a clearer understanding of the relation between students' motivation and their mind wandering. As negative mind wandering can be disruptive to the reading comprehension of students, research about reducing mind wandering is crucial. Therefore, the findings make a valuable contribution to the field by providing insights aimed at reducing negative mind wandering. The results show that motivated students tend to use learning strategies more frequently and experience less mind wandering. These findings suggest that promoting the use of learning strategies can be valuable for students to decrease negative mind wandering. Moreover, the identification of the specific learning strategies, time and study environment, effort regulation, and help seeking, within the mediation process offers valuable insights into which strategies could be

### Motivation, Mind Wandering, and Mediator Learning Strategies

effectively stimulated and used to minimize mind wandering. While the results show that the use of the learning strategies could effectively help students in their learning process, further research should investigate if stimulating learning strategies could significantly affect mind wandering with students. Additionally, future research could explore whether the utilization of learning strategies can prevent the disruption of reading comprehension caused by mind wandering.



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## **Appendix A: Information Letter and Informed consent**

Beste Student,

In deze informatiebrief willen we jou vragen om een vragenlijst in te vullen die gebruikt wordt voor twee onderzoeksprojecten:

1. Mind-Wandering in Students with Attentional Difficulties: The Impact of Learning Strategies
2. The Relationship between Motivation and Mind Wandering: Learning Strategies as a Mediator.

Het eerste onderzoek is geïnteresseerd in de toepassing van leerstrategieën bij studenten die aandachtsproblemen vertonen en dagdromen ervaren. Het tweede onderzoek is geïnteresseerd in het effect van motivatie en leerstrategieën op het ervaren van dagdromen bij studenten. Beide onderzoeken worden uitgevoerd als onderdeel van de master studie Onderwijswetenschappen aan de Universiteit van Utrecht.

### **Wat wordt van jouw als participant verwacht**

Het invullen van een anonieme vragenlijst over de onderwerpen leerstrategieën, motivatie, dagdromen en aandachtsproblemen. Ook vragen we je leeftijd, geslacht en opleidingsniveau. De vragenlijst neemt ongeveer 15 minuten in beslag.

### **Resultaten**

Bij volledig invullen van de vragenlijst krijg je een overzicht te zien van jouw scores op het gebruik van leerstrategieën, motivatie, testangst, en studievaardigheden. Deze inzichten kan je gebruiken om jouw studiegedrag te optimaliseren.

### **Vertrouwelijkheid verwerking gegevens**

Alle gegevens worden vertrouwelijk behandeld en anoniem verwerkt: We vragen niet om jouw naam en geboortedatum, zodat we de gegevens niet aan je kunnen koppelen. We kunnen de data die we verzamelen in dit onderzoek hergebruiken: We kunnen die data delen met andere onderzoekers of via een online database, of gebruiken in ander onderzoek. Omdat we jouw naam, geboortedatum of andere

Motivation, Mind Wandering, and Mediator Learning Strategies

identificerende gegevens niet hebben delen we de data dus anoniem. Jouw gegevens zullen voor minimaal 10 jaar bewaard worden. Dit is volgens de daartoe bestemde richtlijnen van de VSNU. Meer informatie over privacy is te lezen op de website van de Autoriteit Persoonsgegevens:

<https://autoriteitpersoonsgegevens.nl/nl/onderwerpen/avg-europese-privacywetgeving>

Geanonimiseerde data van dit onderzoek zullen op termijn opgenomen worden in een open access database YODA.

### **Vrijwilligheid deelname**

Deelname aan dit onderzoek is vrijwillig. Je kunt op elk gewenst moment, zonder opgave van reden, en vrij van consequenties, stoppen met het onderzoek.

### **Onafhankelijk contactpersoon en klachtenfunctionaris**

Als je vragen of opmerkingen over het onderzoek heeft, kan je contact opnemen met Jesper Smit via [j.smit7@students.nl](mailto:j.smit7@students.nl) of Marieke Huijzer via [m.g.j.huijzer@students.uu.nl](mailto:m.g.j.huijzer@students.uu.nl).

Ook kan je contact opnemen met onze begeleider, Ellen Kok via [e.m.kok@uu.nl](mailto:e.m.kok@uu.nl).

Als je een officiële klacht hebt over het onderzoek, dan kan je een mail sturen naar de klachtenfunctionaris via [klachtenfunctionaris-fetcsocwet@uu.nl](mailto:klachtenfunctionaris-fetcsocwet@uu.nl)

Contactgegevens Functionaris Gegevensbescherming:

<https://www.uu.nl/organisatie/praktische-zaken/privacy/functionaris-voor-gegevensbescherming> of [privacy@uu.nl](mailto:privacy@uu.nl)

Als je na het lezen van deze informatiebrief besluit tot deelname aan het onderzoek verzoeken wij jouw de onderstaande toestemmingsverklaring in te vullen.

Vriendelijke groet,

Jesper Smit en Marieke Huijzer



**Toestemmingsverklaring:**

Hierbij verklaar ik de informatiebrief m.b.t. onderzoeken: *“Mind-Wandering in Tertiary Education Students with ADHD: The Impact of Learning Strategies & The Relationship between Motivation and Mind Wandering: Learning Strategies as a Mediator.”* gelezen te hebben en akkoord te gaan met deelname aan de onderzoeken.

Dit betekent dat ik instem met:

- 1) Deelname aan het onderzoek
- 2) Verzamelen van mijn contactgegevens
- 3) Verzamelen van bijzondere persoonsgegevens, namelijk:
  - Gender
  - Huidige studie
  - Leeftijd

Digitaal vinkje voor akkoord bij online onderzoek

**Appendix B: Dutch MSLQ****Leerstrategieën:  
Herhalen**

	Helemaal niet waar voor mij	Helemaal waar voor mij
1. Als ik voor mijn vakken leer, kijk ik de stof en mijn aantekeningen vaak door.	1 2 3 4 5 6 7	
2. Om de belangrijkste begrippen van de vakken onder de knie te krijgen, leer ik definities uit mijn hoofd.	1 2 3 4 5 6 7	
3. Ik maak lijsten van de belangrijke definities en leer die uit mijn hoofd.	1 2 3 4 5 6 7	
4. Ik herhaal de belangrijkste onderdelen van de studiestof net zo lang tot ik ze uit mijn hoofd ken.	1 2 3 4 5 6 7	
5. Rijtjes met kenmerken van een bepaald verschijnsel leer ik uit mijn hoofd.	1 2 3 4 5 6 7	

**Verwerking**

	Helemaal niet waar voor mij	Helemaal waar voor mij
6. Studeren voor mijn vakken betekent voor mij dat ik informatie uit verschillende bronnen, zoals lesaantekeningen, leerboeken en discussies, verzamel en integreer.	1 2 3 4 5 6 7	
7. Ik verbind de informatie in het ene vak met informatie uit andere vakken.	1 2 3 4 5 6 7	
8. Wanneer ik iets lees voor deze vakken, zoek ik naar verbindingen met wat ik al weet.	1 2 3 4 5 6 7	
9. Als ik leer voor deze vakken maak ik samenvattingen van de centrale punten uit het leerboek en uit mijn aantekeningen.	1 2 3 4 5 6 7	
10. Ik begrijp de stof beter door wat we moeten lezen in verband te brengen met wat de docent heeft verteld.	1 2 3 4 5 6 7	
11. Ik gebruik de leerstof uit het boek bij andere lesactiviteiten, zoals een discussie of een spreekbeurt.	1 2 3 4 5 6 7	

12. De stof die ik leer voor andere vakken, kan ik niet verbinden met een ander vak.	1 2 3 4 5 6 7
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**Organiseren/representeren**

	Helemaal niet waar voor mij	Helemaal waar voor mij
13. Wanneer ik leer voor mijn vakken neem ik door wat ik gelezen en opgeschreven heb en probeer ik het belangrijkste eruit te halen.	1 2 3 4 5 6 7	
14. Ik maak schema's, overzichten en tabellen om de stof te ordenen.	1 2 3 4 5 6 7	
15. Als ik leer voor mijn vakken, loop ik mijn aantekeningen na en maak ik een overzicht van de belangrijkste begrippen.	1 2 3 4 5 6 7	
16. Bij het lezen van de stof voor mijn vakken onderstreep ik om mijn gedachten te kunnen ordenen.	1 2 3 4 5 6 7	
17. Als ik leer, zet ik de begrippen in de leerstof op een logische manier bij elkaar.	1 2 3 4 5 6 7	
18. Ik leer door de belangrijkste begrippen in een overzicht met elkaar te verbinden.	1 2 3 4 5 6 7	
19. Tijdens het leren beschrijf ik voor mezelf hoe ik denk dat de zaak in elkaar zit.	1 2 3 4 5 6 7	

**Kritisch denken**

	Helemaal niet waar voor mij	Helemaal waar voor mij
20. Ik merk dat ik me bij mijn vakken vaak afvraag of ik de dingen die ik lees of hoor wel overtuigend vind.	1 2 3 4 5 6 7	
21. Zodra er een theorie, interpretatie of conclusie wordt gepresenteerd bij mijn vakken, vraag ik me af of die wel voldoende onderbouwd is.	1 2 3 4 5 6 7	
22. Ik zie mijn vakken als een vertrekpunt om mijn eigen visie te ontwikkelen.	1 2 3 4 5 6 7	
23. Over wat ik aan het leren ben, formuleer ik ook mijn eigen denkbeelden.	1 2 3 4 5 6 7	

24. Steeds als ik bij mijn vakken een stelling of conclusie hoor, bedenk ik of je ook iets anders kunt beweren.	1 2 3 4 5 6 7
-----------------------------------------------------------------------------------------------------------------	---------------

**Metacognitie**

	Helemaal niet waar voor mij	Helemaal waar voor mij
25. Tijdens de lessen mis ik vaak belangrijke punten, omdat ik met mijn gedachten ergens anders ben.	1 2 3 4 5 6 7	
26. Wanneer ik lees voor mijn vakken, bedenk ik vragen om mijn aandacht erbij te houden.	1 2 3 4 5 6 7	
27. Voordat ik een nieuwe tekst ga lezen, bekijk ik eerst hoe de tekst is opgebouwd.	1 2 3 4 5 6 7	
28. Ik pas mijn studiemethoden aan aan de eisen voor mijn vakken.	1 2 3 4 5 6 7	
29. Het overkomt me geregeld dat ik iets heb gelezen voor mijn vakken en dat ik niet echt begrijp waarover het gaat.	1 2 3 4 5 6 7	
30. In plaats van alleen te lezen, denk ik eerst over een onderwerp na en bekijk wat ik ervan zou moeten leren.	1 2 3 4 5 6 7	
31. Als ik zit te leren zoek ik uit welke begrippen ik nog niet goed door heb.	1 2 3 4 5 6 7	
32. Ik stel voor mezelf regelmatig doelen vast om zo mijn leerwerk voor mijn vakken te plannen.	1 2 3 4 5 6 7	
33. Als ik tijdens de les mijn aantekeningen onduidelijk vind, zoek ik het na de les meteen uit.	1 2 3 4 5 6 7	

**Hulp zoeken**

	Helemaal niet waar voor mij	Helemaal waar voor mij
34. Als ik definities niet begrijp, vraag ik aan de docent die nog eens uit te leggen.	1 2 3 4 5 6 7	
35. Als ik de stof niet begrijp, vraag ik het aan een andere student of aan de docent.	1 2 3 4 5 6 7	

36. Wanneer ik iets niet snap, ga ik op zoek naar hulp.	1 2 3 4 5 6 7
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**Tijd en studeren**

	Helemaal niet waar voor mij	Helemaal waar voor mij
37. Meestal zit ik te leren op een plek waar ik me kan concentreren.	1 2 3 4 5 6 7	
38. Bij mijn vakken ga ik efficiënt met mijn eigen tijd om.	1 2 3 4 5 6 7	
39. Ik zorg ervoor dat ik op tijd alles gelezen heb en de opdrachten gemaakt heb.	1 2 3 4 5 6 7	
40. Ik ben er tijdens de lessen op gericht zoveel mogelijk op te steken.	1 2 3 4 5 6 7	
41. Ik vind het moeilijk me aan een planning te houden.	1 2 3 4 5 6 7	
42. Ik besteed genoeg tijd aan mijn vakken en ben niet met andere dingen bezig.	1 2 3 4 5 6 7	
43. Ik maak genoeg tijd om voor een proefwerk mijn aantekeningen en leerboek door te nemen.	1 2 3 4 5 6 7	

**Leren met klasgenoten**

	Helemaal niet waar voor mij	Helemaal waar voor mij
44. Omdat ik het dan zelf beter ga begrijpen, probeer ik de leerstof wel eens uit te leggen aan een vriend(in) of klasgenoot.	1 2 3 4 5 6 7	
45. Als het kan, werk ik met andere studenten samen bij het maken van de opdrachten.	1 2 3 4 5 6 7	
46. Als ik zit te leren voor mijn vakken, helpt het me om met klasgenoten over de stof te praten.	1 2 3 4 5 6 7	
47. Ik bereid me vaak samen met klasgenoten voor op een tentamen.	1 2 3 4 5 6 7	

## Motivation, Mind Wandering, and Mediator Learning Strategies

48. Ik controleer vaak samen met klasgenoten of ik de leerstof voldoende heb begrepen.	1 2 3 4 5 6 7
49. Ik werk het liefst alleen.	1 2 3 4 5 6 7

**Sturen van inzet**

	Helemaal niet waar voor mij	Helemaal waar voor mij
50. Ik verveel me vaak zo als ik voor mijn vakken zit te leren, dat ik eerder ophoud dan ik van plan was.	1 2 3 4 5 6 7	
51. Ook als de stof saai is, maak ik mijn werk af.	1 2 3 4 5 6 7	
52. Als de stof me niet interesseert, houd ik er mee op of doe ik alleen de gemakkelijke stukken.	1 2 3 4 5 6 7	
53. Ik werk hard voor mijn vakken ook al interesseert het me niet echt wat er behandeld wordt.	1 2 3 4 5 6 7	
54. Als er dingen zijn die ik eigenlijk liever doe, zorg ik dat ik toch met mijn huiswerk bezig blijf.	1 2 3 4 5 6 7	

**Motivatie**

	Helemaal niet waar voor mij	Helemaal waar voor mij
55. Bij mijn vakken heb ik het liefst een leerboek dat mij nieuwsgierig maakt, ook al is de stof moeilijk.	1 2 3 4 5 6 7	
56. Ik vind het fijn om de stof van mijn vakken helemaal te begrijpen.	1 2 3 4 5 6 7	
57. Als ik de kans krijg, kies ik onderwerpen waar ik iets van leer, zelfs als dat betekent dat ik een minder goed cijfer haal.	1 2 3 4 5 6 7	
58. Bij mijn vakken wil ik graag een uitdagend leerboek zodat ik nieuwe dingen kan leren.	1 2 3 4 5 6 7	

**Extrinsieke motivatie**

	Helemaal niet waar voor mij	Helemaal waar voor mij

## Motivation, Mind Wandering, and Mediator Learning Strategies

59. Op dit moment is het mij heel wat waard om een goed cijfer te halen voor mijn vakken.	1 2 3 4 5 6 7
60. Ik ben er wel op uit een zo hoog mogelijk eindcijfer te halen.	1 2 3 4 5 6 7
61. Ik wil anderen graag laten zien dat ik in staat ben mijn vakken met succes te volgen.	1 2 3 4 5 6 7
62. Ik wil graag beter zijn dan de gemiddelde student.	1 2 3 4 5 6 7
63. Ik leer altijd voor een goed cijfer, of ik een vak nou leuk vind of niet.	1 2 3 4 5 6 7
64. Ik vind het wel mooi als tentamenresultaten voor mijn vakken op het prikbord komen te hangen. Dan kan ik zien hoe goed ik scoor.	1 2 3 4 5 6 7

**Taakwaarde**

	Helemaal niet waar voor mij	Helemaal waar voor mij
65. Ik maak alle opdrachten van mijn vakken, omdat ik de stof van dit jaar graag goed wil beheersen.		
66. Ook door de opdrachten en het huiswerk, ben ik heel geïnteresseerd in waar mijn vakken over gaan.	1 2 3 4 5 6 7	
67. Ik vind de opdrachten die ik voor mijn vakken moet doen leuk.	1 2 3 4 5 6 7	
68. Ik wil heel graag begrijpen waar mijn vakken allemaal over gaan en de opdrachten helpen me daarbij.	1 2 3 4 5 6 7	
69. Door het maken van het huiswerk en de opdrachten leer ik niets extra's over mijn vakken.	1 2 3 4 5 6 7	

**Controle over leren**

	Helemaal niet waar voor mij	Helemaal waar voor mij
70. Als ik op de goede manier studeer, krijg ik de stof van mijn vakken wel onder de knie.	1 2 3 4 5 6 7	

## Motivation, Mind Wandering, and Mediator Learning Strategies

71. Als ik mijn vakken niet haal, ligt dat in de eerste plaats aan mezelf.	1 2 3 4 5 6 7
72. Als ik mij inspan, lukt het mij wel de stof te begrijpen.	1 2 3 4 5 6 7
73. Als ik de stof niet begrijp komt dat omdat ik te weinig moeite heb gedaan.	1 2 3 4 5 6 7
74. Het maakt niet zoveel uit hoe ik leer of hoeveel ik doe, ik begrijp de leerstof of ik begrijp het niet.	1 2 3 4 5 6 7

**Geloof in eigen kunnen**

	Helemaal niet waar voor mij	Helemaal waar voor mij
75. Ik denk dat ik dit jaar goede cijfers ga halen voor mijn vakken.	1 2 3 4 5 6 7	
76. Ik heb wel er vertrouwen in dat ik de teksten die we voor deze vakken moeten lezen – hoe moeilijk ze ook zijn - kan begrijpen.	1 2 3 4 5 6 7	
77. De basisbegrippen van deze vakken krijg ik in elk geval onder de knie.	1 2 3 4 5 6 7	
78. Ik vertrouw erop dat ik ook de ingewikkelde onderwerpen die de docent aan de orde stelt, kan begrijpen.	1 2 3 4 5 6 7	
79. Ik ben vol vertrouwen dat ik mijn opdrachten en tentamen heel goed ga maken.	1 2 3 4 5 6 7	
80. Voor deze vakken haal ik gemakkelijk een voldoende, verwacht ik.	1 2 3 4 5 6 7	
81. Ik weet zeker dat ik de vaardigheden die je bij deze vakken leert, ga beheersen.	1 2 3 4 5 6 7	
82. Wanneer ik kijk naar de eisen van deze vakken, naar de docent en naar	1 2 3 4 5 6 7	

**Testangst**

	Helemaal niet waar voor mij	Helemaal waar voor mij



## Motivation, Mind Wandering, and Mediator Learning Strategies

83. Wanneer ik een tentamen maak, denk ik altijd dat anderen het wel beter zullen doen.	1 2 3 4 5 6 7
84. Wanneer ik met een tentamen vraag bezig ben, moet ik er steeds denken dat ik andere vragen misschien niet weet.	1 2 3 4 5 6 7
85. Als ik een tentamen maak, denk ik altijd aan wat er gebeurt als ik hem niet haal.	1 2 3 4 5 6 7
86. Tijdens een tentamen of proefwerk ben ik altijd opgelaten en onrustig van binnen.	1 2 3 4 5 6 7
87. Ik heb last van de zenuwen als ik een proefwerk maak.	1 2 3 4 5 6 7

**Appendix C: Dutch MWQ**

	Helemaal niet waar voor mij	Helemaal waar voor mij
1. Ik heb moeite om te concentreren tijdens het studeren.	1 2 3 4 5 6	
2. Tijdens het studeren dacht ik niet na over wat ik las, waardoor ik het nog een keer moest lezen.	1 2 3 4 5 6	
3. Ik doe dingen zonder volledige aandacht erbij te hebben	1 2 3 4 5 6	
4. Tijdens het studeren concentreerde ik half, omdat ik tegelijkertijd aan iets anders dacht.	1 2 3 4 5 6	
5. Mijn gedachten dwalen af tijdens colleges of presentaties.	1 2 3 4 5 6	