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From Disorganized Study Methods to Disorganisation: New Perspectives on a  
Neglected Study Strategy

## **1. Introduction**

Dropout and failure in higher education are key issues in many countries. In Europe, for instance, too many students fail to finish diploma or degree courses (European Commission 2015). This is why it is paramount to gain a better understanding of the factors that have an impact on persistence and academic achievement. There has been a great deal of research on success and failure in higher education over the years. Numerous variables may be associated with achievement in higher education. In their systematic review, Schneider and Preckel (2017) identified 105 such variables, which they broke down into two categories, depending on whether they concerned the learning environment or students' characteristics. The latter category included cognitive and metacognitive strategies, namely strategies used to process information or to steer learning activities. Results showed that effort regulation and time or study management had a large- or medium-sized positive effect on students' success. Conversely, maladaptive strategies indicating poor self-regulatory skills, such as academic self-handicapping or procrastination, had a medium-sized negative effect on students' success (Schneider and Preckel 2017). Disorganisation is another potential maladaptive strategy, because it conveys a failure of self-regulation of learning, that is, a difficulty in setting goals, selecting strategies, monitoring ongoing work and reflecting on learning outcomes (Zimmerman, 2000). However, research on disorganisation has been largely overlooked up to

now. The twofold aim of the present study was thus to undertake an overview of research on disorganisation, and explore new avenues for such research.

Referring to Entwistle's work on approaches to study (Entwistle 1988), Elliot, McGregor, and Gable (1999) defined *disorganisation* as "learners' difficulty in establishing or maintaining a structured, organized approach to study" (p. 549). Instead of disorganisation, Entwistle had used the term *disorganized study methods*, the title of a four-item subscale of the Approaches to Study Inventory (ASI; Entwistle and Ramsden 1983). This subscale stresses the lack of time management, mainly addressing dilatory processes such as postponing academic work. Scores on this subscale are negatively correlated with academic performance (Entwistle 1998; Entwistle and Ramsden 1983).

Elliot, McGregor, and Gable (1999) devised a five-item disorganisation scale with a broader scope than Entwistle's scale. Lack of time management is only one of the components of the construct, the other two being uncertainty about goals (the *what* of study) and which study skills to use (the *how* of study). Elliot, McGregor, and Gable's disorganisation scale is actually closer to Vermunt (1998)'s lack of regulation scale than to Entwistle's disorganized study methods scale. Vermunt's scale also emphasizes the difficulty of clearly defining study goals and knowing how to study the learning material. As a consequence, disorganisation and lack of regulation are two constructs that largely overlap.

### **1.1 State of research on disorganisation**

Elliot et al. (1999) conducted two studies showing that disorganisation mediates the relationship between performance-avoidance goals and exam performance. Performance-avoidance goals are positive predictors of disorganisation, which has a significant negative impact on exam performance. Performance-avoidance goals may trigger threat and apprehension, thereby undermining an organized study method. In turn, disorganisation "is

likely to cause students to be ill prepared come evaluation time, thus leading to anxiety and worry during the examination process” (Elliot et al. 1999, p. 560).

Despite these challenging results, disorganisation has received little attention to date, such that only a handful of studies have focused on it. These studies referred to different theoretical frameworks, mostly achievement goals, but also self-determination theory (Boiché and Stephan 2014; Cheon et al. 2019; Jang, Kim and Reeve 2016). *Achievement goals* refer to the pursuit of competence in achievement contexts. *Performance goals* are focused on the demonstration of competence relative to others, while *mastery goals* highlight the development of competence and task mastery. Moreover, an achievement goal may be focused on either attaining a desirable possibility (*approach goal*) or avoiding an undesirable possibility (*avoidance goal*) (Elliot and Trash 2001). Regarding the antecedents of disorganisation, most studies have looked at how achievement goals affect disorganisation. When disorganisation was regressed over achievement goals, performance-avoidance goals emerged as significant positive predictors of disorganisation (Al-Emadi 2000; Corker and Donnellan 2012; Cosnefroy, Fenouillet, Mazé and Bonnefoy 2018; Elliot and McGregor 2001; Senko and Miles 2008). Mastery-avoidance goals were also found to be significant positive predictors in all the studies that included this goal (Corker and Donnellan 2012; Cosnefroy et al. 2018; Darnon and Butera 2005; Elliot and McGregor 2001). All results consistently showed that avoidance goals (either performance or mastery, when included in the study) are positive predictors of disorganisation.

Most studies investigating the relationship between disorganisation and performance have shown that disorganisation has a negative impact on academic performance or is negatively correlated with performance (Bandalos, Finney and Geske 2003; Corker and Donnellan 2012; Cosnefroy et al. 2018; Elliot, McGregor, and Gable 1999; Grant and Dweck 2003; Harackiewicz et al. 2000; Senko and Miles 2008), although neither Berger and Freud

(2012) nor Phan (2009) observed a significant effect on performance. It should be noted that control of potential confounding variables differed quite considerably across studies. No control variables were used in the studies by Cosnefroy et al. (2018), Grant and Dweck (2003), and Senko and Miles (2008). Harackiewicz et al. (2000) controlled for sex, while Berger and Freud (2012), Corker and Donellan (2012) and Elliot et al. (1999) controlled for both sex and prior achievement.

Finally, three studies were grounded in *self-determination theory*. They viewed disorganisation as an indicator of students' cognitive disengagement. First, Boiché and Stephan (2014) investigated how cognitive strategies are a mediator between motivational profiles and achievement. The level of disorganisation varied significantly between the five motivational profiles these authors identified. Mean disorganisation scores were higher for the non-self-determined profile, in which external motivation and amotivation are salient. This profile also leads to weaker academic achievement. Time spent studying tends to decrease when mean disorganisation scores increase. Second, recent developments in self-determination theory have highlighted the distinction between need dissatisfaction (lack of need satisfaction) and need frustration (or need thwarting), that is "perceptions that psychological needs are actively undermined by others" (Costa, Ntoumanis, and Bartholomew 2015, p. 12). Two studies showed that autonomy need dissatisfaction and autonomy need frustration positively predict disengagement, whereas autonomy satisfaction negatively predict it. Autonomy dissatisfaction is fueled by the indifference of the teacher, who pays no attention to students' needs, whereas autonomy frustration is fueled by the control of the teacher, who tries to gain control over students' behavior through pressure-inducing tactics (Cheon et al. 2019; Jang, Kim and Reeve 2016). Unlike studies within the achievement goal framework, these two highlight the potential impact of teacher's behavior on disorganisation.

In conclusion, research on disorganisation has tended to corroborate the seminal work by Elliot et al. (1999) on the antecedents and consequences of disorganisation. All studies have confirmed that avoidance goals are positive predictors of disorganisation, and most of them that disorganisation is a negative predictor of academic performance. However, other variables besides achievement goals may also be significant predictors of disorganisation, such as teacher support. Furthermore, the very few studies controlling for both sex and prior achievement to assess the impact of disorganisation on academic performance have yielded mixed results: no impact for Berger and Freud (2012), and a negative impact for Corker and Donellan (2012) and Elliot et al. (1999). Thus, further investigations are needed to gain a better understanding of the predictors of disorganisation and to confirm the impact of disorganisation on academic performance. Lastly, some studies have suggested that disorganisation is closely linked to student disengagement (Boiché and Stephan 2014; Cheon et al. 2019; Jang, Kim, and Reeve 2016). *Student engagement* refers to a student's active involvement in a learning activity (Reschly and Christenson 2012). It is viewed as a multidimensional construct, often with four components: *behavioral engagement* pertains to effort and persistence; *emotional engagement* relates to being interested in learning activities, as well as having a sense of belonging to a university; *cognitive engagement* refers to allocation of varying amounts and types of cognitive resources; and *agentic engagement* pertains to proactive behavior during instruction (Sinatra, Heddy, and Lombardi 2015). Disorganisation can be viewed as *student disengagement*, when linked to low study time. Although disorganisation was negatively associated with time spent studying in prior studies (Boiché and Stephan 2014), it may also be associated with high study time. Uncertainty about study goals and study methods, which is the main feature of disorganisation, is likely to increase when learners are facing new learning tasks, as they can no longer rely on routine forms of studying. First-year undergraduate students must handle the transition from

secondary to higher education. Compared with secondary students, higher education students are expected to learn more independently. They are confronted with new teaching and studying methods, as well as new content, trying to perform new academic tasks with familiar, tried-and-trusted learning strategies (Kyndt et al. 2015; Vermunt and Donche 2017). Sometimes teaching strategies and learning strategies are not compatible. Some students experience what Vermunt and Verloop (1999) call destructive frictions when the contrast between the teacher-dependent way of learning they experienced in secondary school and the highly self-regulated form of learning that is expected at university is too great. We can assume that such changes potentially trigger disorganized study methods, even though students are eager to learn and make an effort. In such cases, disorganisation corresponds not to disengagement, but to engagement, insofar as students are trying hard to study the academic material.

## **1.2 The Present Study**

The purpose of the present study was threefold. First, we investigated the relationship between disorganisation and academic success, controlling for sex and prior academic achievement, in order to gain a more accurate assessment of the impact of disorganisation on academic achievement.

Second, we expanded the study of potential determinants of disorganisation by encompassing context-related variables and students' prior achievement-related variables. Cheon et al. (2019)'s and Jang, Kim, and Reeve (2016)'s results suggested that teachers' behavior helps students to handle disorganisation. Likewise, learners are liable to experience lack of regulation – which is similar to disorganisation - when the external regulation provided by teachers and peers is not sufficient (Ferla, Valcke, and Schuyten 2009; Vermunt and Vermetten 2004). Thus, one can assume that falling back on external help is paramount to reduce uncertainty about the *what* and *how* of study, which characterizes disorganisation and

lack of regulation. This external help may come from two sources: teachers and peers. As they convey teachers' concern for students' needs, supportive teaching practices, such as a student-centered teaching, may help students reduce their disorganisation. Regarding peers, social integration should also help students to find resources to cope with disorganisation, insofar as "a student's sense of loneliness is likely to isolate the student from peers who might be able to offer assistance on academic tasks" (Credé and Niehorster 2012, p. 140). With respect to students' prior achievement, we can assume that two distinct mechanisms may impact disorganisation: work habits (distal impact), and lack of knowledge acquired during the academic year (proximal impact). Rather than laying emphasis on time spent studying, Corno (2004) chose to define *good work habits* as "strategies and tactics for completing academic tasks that become honed through experience" (p. 1671). Having developed good work habits, high achievers in high school may be better able than low achievers to handle the new academic tasks they have to undertake at university, without becoming anxious and experiencing disorganisation. With regard to *lack of knowledge*, Entwistle (1988) pointed out that disorganized study methods are correlated with comprehension difficulties. Similarly, Phan (2009) claimed that a lack of relevant knowledge may manifest itself in the form of disorganisation. Comprehension difficulties and lack of relevant knowledge make it harder to thoroughly identify what is crucial to study. Thus, poor results over the current academic year (e.g., over the first semester) may foster the development of disorganisation later on (e.g., over the second semester).

Third, we hypothesized that disorganisation may be consistent with either student engagement or student disengagement. Learners' disorganisation scores may mean different things, depending on their links to other learning dimensions, especially time spent studying. Thus, it would be worthwhile showing that students with a high level of disorganisation may be characterized by either high or low study time. In line with this goal, we adopted a person-



centered approach, with disorganisation and time spent studying as cluster variables. In a second step, we assessed whether this clustering was predictive of student engagement, using two target variables: procrastination and mastery approach goals. *Procrastination* is defined as delaying the initiation or completion of a goal to the point of discomfort (Howell and Watson 2007). As such, it is a form of cognitive and behavioral disengagement. *Mastery-approach goals* are focused on the development of competence through task mastery. They may help students develop an interest-based engagement in learning activities (Sommet and Elliot 2017).

## **2. Method**

### **2.1 Participants and Procedure**

Participants were 177 (155 men, 22 women;  $M_{\text{age}} = 18.94$  years,  $SD = 1.46$ ) students in their first year of a 2-year STEM course at a French university institute of technology. The study was conducted in April 2016. Data collection was carried out during regular courses by the author of the article. Students were informed of the purpose of the study and completed a consent form before answering the questionnaire. Overall scores for the first (S1) and second (S2) semesters were obtained from the course instructors at the end of the academic year.

### **2.2 Instruments**

Students completed a self-report questionnaire that measured different facets of their motivation and study strategies, as well as their perception of the learning environment and their integration into student life. They responded on a 7-point scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*) with intermediate anchor points, having descriptive labels as well for all the scales included into the questionnaire except for the time spent studying scale.

#### **Achievement goals.**

We used Elliot and McGregor (2001)'s French validation of the 12-item Achievement Goal Questionnaire (Darnon and Butera 2005) to assess achievement goals. Each type of

achievement goal (i.e., performance-approach goal, mastery-approach goal, performance-avoidance goal, and mastery-avoidance goal) was measured with three items. We did not include the mastery-avoidance goal construct, as items assessing this goal are not always frequently endorsed or well understood by respondents (Linnenbrink-Garcia et al. 2018).

### **Social integration.**

Social integration was assessed using a short version of Neuville et al. (2013)'s 10-item scale. Drawing on the French adaptation (Larose, Soucy, Bernier and Roy, 1996) of the Student Adaptation to College Questionnaire (Baker and Siryk, 1984), this scale explores both the quality of relationships between peers and engagement in extracurricular activities. Given the research question, we were more interested in the peers' social support dimension. Thus, we only kept the five items focusing on the quality of relationships between peers. These items reflect judgments about existing friends or the social skills needed to make new friends (e.g., "I have good friends with whom I can talk about any problem I might have" or the reverse item "I have a sense of loneliness in this institute").

### **Teachers' concern for students' development.**

A short 6-item version of the French validation (Neuville et al. 2013) of Mannan (2001)'s scale was used to assess students' perception of teachers' concern for students' needs, that is, their ability to adopt student-centered teaching. Items included "Teachers take our suggestions into account", and "Teachers strive to really understand the learning difficulty students have to cope with".

### **Disorganisation.**

Elliot, McGregor, and Gable (1999)'s five-item disorganisation scale was adapted to the French language and validated by Darnon and Butera (2005). We used a slightly different form containing only four items, as preliminary studies (Author et al., 2018) had shown that one of the initial scale's items had insufficient psychometric qualities.

### **Procrastination.**

Author et al. (2018)'s French six-item procrastination scale was used to assess procrastination. Three items explored difficulty initiating an action (e.g., "It takes a lot of effort for me to start working"), whereas the other three focused on difficulty pursuing an action until its completion (e.g., "If I take a break when I'm studying, I have a lot of trouble getting back to work").

### **Time spent studying.**

Participants were asked to report the number of hours they spent studying each weekday and across the weekend on a 4-point Likert scale (1 = *None*, 2 = < 1 hr, 3 = 1-2 hr, 4 = > 2 hr per day for weekdays, and 1 = *none*, 2 = < 2 hr, 3 = 2-4 hr, 4 = > 4 hr for the weekend). Both measures were then averaged to obtain an index of time spent studying.

### **High-school achievement.**

Students self-reported the grade they received for the French baccalaureate: pass ( $n = 51$ ), quite good ( $n = 77$ ), good ( $n = 38$ ), or very good ( $n = 11$ ).

### **Higher education achievement.**

Grades in France's higher education system range between 0 and 20, and students need a mean grade equal to or above 10 to obtain a credit for the semester. The overall mean for the semester was used as an indicator of achievement in both S1 and S2. To calculate this overall mean, we averaged the grades awarded in continuous assessments and final exams, weighted with coefficients according to their relative importance in the program.

## **3. Results**

Data were analyzed using SPSS Version 21.

### **3.1 Missing Data**

As the percentage of missing data for this study was below 5% (1.33% of data points), we used the expectation maximization algorithm to handle missing data, as it is regarded as an appropriate missing data method (Graham and Hoffer 2000).

### 3.2 Reliability and Validity of Self-Report Measures

All the scales we used had previously been validated in the above-mentioned studies. However, we chose to use abridged versions of three of them, namely disorganisation, teachers' concern, and social integration. To ensure the validity of these abridged versions, we ran a confirmatory factor analysis with Amos 21. The disorganisation items, teachers' concern items and social integration items all loaded onto their hypothesized factors. The standardized loadings were above .57 for social integration, above .67 for teachers' concern, and above .68 for disorganisation. This three-factor model fitted the data well:  $\chi^2/df = 1.54$ , CFI = .955, RMSEA = .055, 90% CI [.036, .073], RMR = .10.

### 3.3 Descriptive Statistics

We first examined the descriptive statistics, reliability (cf. Table 1) and intercorrelations of the variables used in the study.

Table 1

*Means, Standard Deviations, Skewness and Reliability for Study Variables*

Variables	Range	<i>M</i>	<i>SD</i>	Skewness	$\alpha$
Disorganisation	1.00-6.50	3.60	1.44	-.16	.85
Teachers' concern	1.83-6.83	5.12	0.90	-.91	.86
Social integration	1.60-7.00	5.77	0.91	-.91	.79
MAP	1.00-7.00	4.86	1.28	-.61	.82
PAP	1.00-7.00	3.63	1.76	.17	.92
PAV	1.00-7.00	4.32	1.42	-.39	.61
Procrastination	1.00-7.00	4,34	1,41	-.23	.82
Time spent studying	1.00-4.00	2,42	.59	.15	.60

S2 overall mean	2.24-16.08	11.61	2.18	-.84
S1 overall mean	4.73-16.45	11.99	1.78	-.29

*Note.* MAP = mastery-approach goals; PAP = performance-approach goals; PAV = performance-avoidance goals.

Table 2 sets out the zero-order correlations for all of the observed variables. Consistent with predictions, the correlation matrix revealed that disorganisation was associated with poorer academic performance, for both S1 ( $r = -.24, p < .01$ ) and S2 ( $r = -.29, p < .01$ ). Consistent with prior research, performance-avoidance goals were positively associated with disorganisation ( $r = .23, p < .01$ ). Disorganisation was associated with less time spent studying, but the correlation was weak, albeit significant ( $r = -.18, p < .05$ ).

Table 2

*Zero-Order Correlations Among Variables*

Variables	1	2	3	4	5	6	7	8	9	10
1. Disorganisation	1									
2. Teachers' concern	-.04	1								
3. Social integration	-.17*	.25**	1							
4. MAP	-.16*	.42**	.14*	1						
5. PAP	-.09	.10	-.04	.40**	1					
6. PAV	.23**	-.09	.03	-.05	.22**	1				
7. Time spent	-.18*	.17*	-.10	.40**	.27**	.26**	1			
8. Procrastination	.68**	-.14	-.12	-.28**	-.05	.15*	-.47**	1		
9. S2 overall mean	-.29**	.22**	.20*	.24**	.31**	-.18*	-.01	-.22**	1	
10. S1 overall mean	-.24**	.14	.14	.14	.24**	-.16*	-.04	-.18*	.81**	1

*Note.* MAP = mastery-approach goals; PAP = performance-approach goals; PAV = performance-avoidance goals.

### 3.4 Preliminary Analyses

We first performed  $t$  tests to assess the differences in mean disorganisation scores and S2 overall performance according to sex. Differences on S2 academic performance

between male and female students were not significant ( $M = 11.57$  vs.  $M = 11.87$ ;  $t = -.60$ ,  $ddf = 175$ ,  $ns$ ). Likewise, no differences between male and female students were observed regarding disorganisation ( $M = 3.67$  vs.  $M = 3.16$ ;  $t = 1.56$ ,  $ddf = 175$ ,  $ns$ ). Given these results, sex was not included in subsequent regression analyses.

### 3.5 Hierarchical Regression Predicting S2 Academic Performance

A three-step hierarchical regression was used to predict S2 performance. In the first step, final performance at high school was entered as a predictor. In the second step, S1 academic performance was entered as a predictor. In the third step, disorganisation and time spent studying were added as predictors. Results are set out in Table 3. First, high-school performance predicted a significant amount of variance in S2 academic performance,  $F(1, 164) = 6.85$   $p < .01$ . Results from Step 2 indicated that adding S1 academic performance increased the amount of variance explained by 61%,  $F(1, 163) = 253.5$ ,  $p < .01$ . High-school performance ceased to be a significant predictor. Adding disorganisation increased the amount of variance explained by 1%,  $F(2, 161) = 3.33$ ,  $p < .01$ . Even when we controlled for students' prior achievement, disorganisation was a negative significant predictor of students' S2 academic achievement ( $\beta = -.10$ ,  $p < .05$ ).

Table 3

#### *Summary of Hierarchical Regression Analysis Predicting S2 Academic Performance*

Variable	B	SE B	$\beta$	$R^2$	$\Delta R^2$
Step 1				.05**	
High-school achievement	.52	.17	.23**		
Step 2				.66	.61**
High-school achievement	.18	.10	.08		
S1 academic performance	.97	.06	.80**		
Step 3				.67	.01*
High-school performance	.18	.10	.08		
S1 academic performance	.94	.06	.77**		
Disorganisation	-.15	.07	-.10*		

Note. \*  $p < .05$ . \*\*  $p < .01$ .

### 3.6 Hierarchical Regression Predicting Disorganisation

We ran a four-step hierarchical regression to predict disorganisation. In the first step, high-school achievement was entered as predictor of disorganisation, followed in the second step by S2 academic performance. In the third step, mastery-approach goals, performance-approach goals, and performance-avoidance goals were included in the analysis. In the fourth step, social integration and teachers' concern were added as predictors. The results of the equations predicting disorganisation are set out in Table 4. Performance-avoidance goals were positive predictors of disorganisation ( $\beta = .24, p < .01$ ). With regard to students' prior achievement-related variables, high-school performance was not a significant predictor of disorganisation, whereas S1 overall mean was ( $\beta = -.17, p < .05$ ). Likewise, results were mixed for context-related variables. Teachers' concern was not a significant predictor of disorganisation, whereas social integration was ( $\beta = -.18, p < .05$ )

Table 4  
*Summary of Hierarchical Regression Analysis Predicting Disorganisation*

Variable	B	SE B	$\beta$	$R^2$	$\Delta R^2$
Step 1				.00	<i>ns</i>
High-school achievement	-.08	.11	-.05		
Step 2				.06	.06**
High-school achievement	-.01	.11	-.01		
S1 academic performance	-.19	.06	-.24**		
Step 3				.11	.05*
High-school performance	.04	.11	.03		
S1 academic performance	-.15	.06	-.18*		
MAP	-.11	.09	-.10		
PAP	-.04	.07	-.05		
PAV	.22	.08	.22**		
Step 4				.14	.03*
High-school performance	.09	.12	.06		
S1 academic performance	-.14	.06	-.17*		
MAP	-.13	.10	-.11		
PAP	-.06	.07	-.07		

PAV	.25	.08	.24**
Teachers' concern	.17	.13	.11
Social integration	-.29	.12	-.18*

Note.  $N = 164$ . MAP = mastery-approach goals; PAP = performance-approach goals; PAV = performance-avoidance goals.

\*  $p < .05$ . \*\*  $p < .01$ .

### 3.7 Cluster Analysis

The SPSS TwoStep clustering method was performed with disorganisation and time spent studying as cluster variables. The TwoStep procedure automatically determines the appropriate number of clusters after  $z$ -standardizing the cluster variables. The cluster analysis yielded a mean silhouette measure of cluster cohesion and separation of 0.50, suggesting fair to good overall result quality (index range from -1 to +1). The first cluster ( $n = 48$ , 27.1% of the sample), was characterized by a high mean score (4.60) on disorganisation and the second highest mean score on time spent studying (2.84). The second cluster ( $n = 51$ , 28.8%) was characterized by the lowest mean score on disorganisation (2.26) and the highest mean score on time spent studying (2.87). The third cluster ( $n = 41$ , 23.2%) was characterized by the second lowest mean score on disorganisation (2.73) and the lowest mean score on time spent studying (1.87). The fourth cluster ( $n = 37$ , 20.9%), was characterized by the highest mean score on disorganisation (5.14) and the second lowest mean score on time spent studying (1.88). Clusters 1 and 4 showed that the highest scores on disorganisation could be associated with either weak study time (Cluster 4) or high study time (Cluster 1).

Clusters were then compared on mastery-approach goals and procrastination. A multivariate analysis of variance (MANOVA) with cluster membership as the independent variable showed a significant effect of cluster membership, with Wilks'  $\lambda = .50$ ,  $F(6, 344) = 23.79$ ,  $p < .01$ ,  $\eta^2 = .29$ . Follow-up ANOVAs revealed significant effects of cluster membership on procrastination,  $F(3, 173) = 52.54$ ,  $p < .001$ ,  $\eta^2 = .48$ , and mastery-approach goals,  $F(3, 173) = 5.68$ ,  $p < .01$ ,  $\eta^2 = .09$ . A Tukey post hoc test revealed that Clusters 1 and 4



differed significantly from one another on both variables. Cluster 1 had a lower score on procrastination than Cluster 4 ( $M = 4.68$  vs.  $M = 5.62$ ,  $p < .01$ ), while Cluster 1 had a higher score on mastery-approach goals than Cluster 1 ( $M = 5.16$  vs.  $M = 4.33$ ,  $p < .05$ ).

To verify the stability of the extracted cluster solution, we ran a four-class cluster analysis, using a K-means clustering method. Square Euclidean distance was used as a measure of proximity between two observations. Results also revealed two contrasting groups regarding high scores on disorganisation. Cluster 1 ( $n = 56.31$ , 6% of the sample) was characterized by the second highest mean disorganisation score (4.44) and the highest time spent studying score (2.63), whereas Cluster 4 ( $n = 31$ , 17.5%) was characterized by the highest disorganisation score (5.52) and the lowest time spent studying score (1.98). A MANOVA with cluster membership as the independent variable revealed a significant effect of cluster membership on procrastination and mastery-approach goals, with Wilks'  $\lambda = .58$ ,  $F(6, 344) = 18.22$ ,  $p < .01$ ,  $\eta^2 = .24$ . Follow-up ANOVAs revealed a significant effect of cluster membership on both procrastination,  $F(3, 173) = 40.63$ ,  $p < .001$ ,  $\eta^2 = .41$ , and mastery-approach goals,  $F(3, 173) = 2.67$ ,  $p < .05$ ,  $\eta^2 = .04$ . A Tukey post hoc test showed that Clusters 1 and 4 differed significantly on procrastination. Cluster 1 had a lower mean procrastination score than Cluster 4 ( $M = 4.70$  vs.  $M = 5.75$ ;  $p < .01$ ), but they did not differ significantly on mastery-approach goals ( $M = 4.96$  vs.  $M = 4.46$ ).

#### **4. Discussion**

The first goal of the present study was to provide stronger evidence of the impact of disorganisation on academic performance, by simultaneously controlling for two variables, namely sex and prior achievement. After verifying in a preliminary analysis that sex had no effect, the hierarchical regression analysis showed that adding disorganisation at the last step while controlling for mean S1 scores significantly increased the percentage of explained variance, albeit only slightly. Thus, disorganisation makes a unique contribution to academic

achievement beyond prior achievement. The effect of disorganisation may have been underestimated, as it may already have impacted mean S1 scores. For some students, disorganized study methods were probably present from the start of the academic year, rather than emerging during the second semester, leading to damaging consequences for overall performance in the first semester.

The second goal of the study was to gain a better understanding of the determinants of disorganisation, by adding two categories of variables that had never previously been taken into account (i.e., prior achievement and social support) to achievement goals. Each of these categories was broken down into two subcategories: proximal prior achievement (i.e., S1 mean scores) and distal prior achievement (i.e., high-school achievement), and teacher's concern for student needs and student's social integration. With regard to prior achievement, results showed that S1 mean scores were a significant negative predictor of disorganisation. This finding is in line with prior research indicating that disorganized methods or disorganisation are fueled by misunderstanding and lack of knowledge (Entwistle, 1988; Phan, 2009). By contrast, we did not find that high-school achievement was a significant negative predictor of disorganisation. Although high achievers may have been able to develop powerful study habits at high school, they may not have allocated enough time to studying because they had a high belief in their ability, as suggested by Vancouver and Kendall (2006). Hence, good study habits may be counterbalanced by insufficient time spent studying. As for social support variables, results showed that teachers' concern had no effect on disorganisation, whereas social integration had a significant effect. The scale items probing teachers' concern mainly depict teachers who are open to discussion, striving for a better understanding of their students' needs and difficulties. Teachers who are receptive to their students' thoughts and feelings adopt an autonomy-supportive style (Reeve, 2009). However, providing autonomy support is probably not enough to help students self-regulate. They also

need structure. In other words, they require teachers to communicate clear expectations and frame their learning activity with explicit direction and guidance (Jang, Reeve, and Deci 2010). Teacher-provided structure increases students' perceived competence and perceived control over outcomes, which is paramount to combat disorganisation. The absence of an effect of the teacher's concern variable on disorganisation is probably due to the fact that this variable was measured with a scale that mainly focused on the autonomy-supportive dimension of the teacher's activity, rather than on the structure dimension. Overall, the present findings make a substantial contribution to our knowledge of the determinants of disorganisation. They pave the way for a multidimensional approach to the determinants of disorganisation that involves not only motivational factors (performance-avoidance goals), but also cognitive (lack of knowledge) and social (lack of social support) factors.

The third goal of the study was to ascertain whether disorganisation can be associated with student engagement. Both clustering methods highlighted two disorganisation groups, which differed according to the amount of time spent studying. Results clearly showed that disorganisation can be associated with time spent studying. Most important, these two contrasting groups differed on their impact on engagement-related variables. The disorganisation with high study time cluster had significantly weaker procrastination scores and higher mastery-approach goals (but only for the TwoStep clustering method) than the disorganisation with low study time cluster. These findings support the view that disorganisation and engagement are not mutually exclusive. Disorganisation is liable to increase during the first year in higher education because of changes in what is expected of students. The transition experience involves the loss of a secure learner identity (Christie, Tett, Cree, Hounsell, and McCune 2016). Thus, disorganisation does not necessarily mean that students are disengaged. Rather, it means that they try to learn the new rules and move toward a new learner identity. However, our results did not completely support our

assumption, for although each of these two groups had a mean disorganisation score above the overall one, this score was lower when it was associated with high time spent studying than when it was associated with low time spent studying. This pattern may indicate that above a certain threshold, disorganisation becomes so highly developed that it triggers discouragement which, in turn, undermines behavioral and motivational engagement.

## **5. Limitations and Implications for Research and Practice**

The present study had two limitations. First, the sample was relatively small and the students were all studying the same academic subject. It would therefore be useful to extend the study of the antecedents and consequences of disorganisation to a wider range of academic subjects. A second limitation was the unequal sex ratio, which prevented us from accurately measuring the impact of sex on disorganisation, even though previous research has failed to find an effect of sex. Future research should replicate the results reported here with larger samples that are more representative of students entering higher education.

Despite the aforementioned limitations, the present study makes two important contributions to the literature. First, it shows that disorganisation is a multidimensional process combining motivational, cognitive and social dimensions. Second, it provides evidence that disorganisation may sometimes be associated with student engagement, especially when students experience a transition. Hence, equating disorganisation with disengagement is too restrictive a view. These findings have both theoretical and practical implications. First, a transition can be defined as any major shift in students' role requirements or study context that involves changes and having to cope with these changes (Coertjens, Brahm, Trautwein, and Lindblaum-Ylänne 2017). For example, when international students attend foreign universities, they undergo a transition. They have to learn the rules of a new game that are not made explicit (Carroll and Appleton 2007; Heng 2017). Accordingly, we can assume that international students are likely to experience

disorganisation while trying to adapt to their new learning environment. Additional research is needed to evaluate this hypothesis. When considering implications for practice, supporting students' social integration would help to preclude, or at least curtail, disorganisation. As the classroom is an interface between the social and the academic (Tinto, 1997), social integration could be promoted in the classroom through group learning activities. However, it is crucial to ensure that the configuration of the groups often changes, in order to support social interactions with as many peers as possible. Finally, the results indicate that, in terms of helping students who are experiencing disorganisation, any support that teachers might offer to encourage students' autonomy is insufficient. A teaching style that combines the promotion of autonomous learning with more direct instruction (above all, giving clear instructions when introducing new tasks) would probably more helpful for such students.

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