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**Metacognitive components of writing: construction and validation of the  
Metacognitive Components of Planning Writing Self-inventory (MCPW-I)**

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# **Metacognitive components of writing: construction and validation of the Metacognitive Components of Planning Writing Self-inventory (MCPW-I)**

## **Abstract**

### **Introduction**

Writing and metacognition play an essential function in the learning process, in that writers engage arduous cognitive efforts by selecting and organizing ideas, then reviewing and readjusting them.

### **Objective**

The present research aimed to construct and validate a self-report instrument to measure some specific metacognitive processes implicated in writing planning. Two categories of metacognitive components were considered: metacognitive knowledge and self-regulation strategies.

### **Method**

Based on exploratory and confirmatory analyses, the Metacognitive Components of Planning Writing Self-inventory (MCPW-I) was constructed and validated. This instrument is composed of three factors: Metacognitive Conditional Knowledge - MCK (6 items), Covert Self-regulation - CSF (4 items) and Environmental self-regulation - ESF (5 items). 1022 undergraduates students engaged in various programs of a French university filled in the inventory

### **Results**

The alpha coefficients indicated a reliable internal consistency and the test-retest reliability showed a good temporal stability. Correlational analyses revealed that the CRS factor was related to ESR and MCK factors, and these last two were not correlated with each other. After the analysis of variance, the responses relative to ESR and MCK dimensions differed according to gender, but no differences relatively to the academic disciplines considered was found. Concerning the predictive validity, CSF and MCK were correlated with writing performance.

### **Conclusion**

The results confirm the validity and reliability of the MCPW-I which constitutes a new research tool for the study of metacognitive processes of writing.

Key words: Covert self-regulation, environmental self-regulation, metacognitive conditional knowledge, self-report instrument, strategies, writing planning.

# **Processus métacognitifs de l'écriture: construction et validation de l'échelle**

## **Composantes Métacognitives de la Planification de l'écriture**

### **Résumé**

#### Introduction

L'écriture et la métacognition jouent un rôle important dans l'apprentissage dans la mesure où, durant l'acte d'écrire, l'individu investit une série de processus exigeants du point de vue cognitive, en particulier au cours de la sélection, l'organisation et la révision des idées.

#### Objectif

La présente recherche avait pour but de construire et valider un instrument d'auto-report permettant de mesurer des processus métacognitifs impliqués dans la planification de l'écriture. Deux catégories de processus métacognitifs ont été prises en compte: les connaissances métacognitives et les stratégies d'autorégulation.

#### Méthode

A partir d'analyses exploratoires et confirmatoire, l'échelle des Composantes Métacognitives de la Planification de l'Écriture a été construite et validée. Cet instrument est composé de trois facteurs : Connaissances Déclaratives Conditionnelles (6 questions), Autorégulation interne (4 questions) et Autorégulation du contexte (5 questions).

#### Résultats

Les coefficients alpha révèlent une bonne consistance interne, et la fiabilité test-retest permet de démontrer la stabilité temporelle des résultats issus de l'échelle. Des analyses corrélationnelles indiquent que l'autorégulation interne est corrélée aux connaissances métacognitives conditionnelles et à l'autorégulation du contexte, mais ces deux derniers composants ne sont pas corrélés entre eux.

Suite à des analyses de variance, nous trouvons des différences en fonction du genre en ce qui est de deux composantes: autorégulation du contexte et connaissances métacognitives conditionnelles. En revanche, aucune différence n'a été mise en évidence relativement aux filières d'études. Concernant

la validité prédictive, les connaissances métacognitives et l'autorégulation interne sont corrélées aux performances en écriture.

### Conclusion

Les résultats confirment la validité et la fiabilité du MCPW-I qui constitue un nouvel outil pour l'étude des processus métacognitifs de l'écriture.

### Mots clés :

Instrument d'auto-report, planification de l'écriture, connaissances métacognitives conditionnelles, autorégulation interne, autorégulation du contexte.

## Introduction

Writing plays an essential function in the learning process, in that writers engage arduous cognitive efforts by selecting and organizing ideas, then reviewing and readjusting them –taking into account the task requirements (Galbraith, 2015; Kellogg, 2008; Wäschle, Gebhard, Oberbusch, & Nückles, 2015). Through the writing process, individuals can transform their knowledge while they make connections between their own ideas and new information or content from various sources (Bereiter, 1980; Harris, Graham, Brindle, & Sandmel, 2009). Additionally, in the higher education context, learners' writing contributes to a full assessment of their acquired knowledge. In fact, a significant proportion of assessment methods at university level involve the writing competences of students, for example written exams and written productions such as essays or papers. In this context, characterized by a diversity of constraints and requirements, writing becomes an arduous cognitive activity, a real challenge in so far as students have to face this variety of demands for autonomy and metacognitive control of the processes involved in writing (Kellogg & Raulerson, 2007).

A set of cognitive processes are required for writing (Alamargot & Chanquoy, 2001). Writing is defined as a problem-solving task that requires the metacognitive control of planning, text generation and reviewing (Hayes, 2012), the recursiveness being a critical trait of writing (Olive, Kellogg, & Piolat, 2002). Among these writing processes, planning plays a key role in the sense that it has connections with working and long term memory, which contain such knowledge as is necessary to write (Kellogg, 1996; Limpo & Alves, 2018). Planning has to do with making decisions about the content, aims and organisation for producing the written text. More recently, planning has been analysed as a distinct writing activity, composed by sub-processes, and not only as part of a more general process (Hayes, 2012). Moreover, studies have demonstrated that planning processes are correlated with writing performance (Escorcía, Passerault, Ros, Pylouster, 2017; Beauvais, Olive, & Passerault, 2011; Graham, Harris & Mason, 2005). Considering the plurality of processes that planning comprises, and its contribution to writing performance, the present study was focused on

constructing and validating an instrument able to precisely describe some metacognitive aspects of planning writing.

### *Cognitive processes of planning*

Planning has been more recently considered as a specialized writing activity which consists in identifying and selecting the ideas to be written (Chenoweth & Hayes, 2003; Hayes, 2012). This activity includes two key sub-processes: generating content and organizing ideas which perform specific functions (Hayes & Nash, 1996; Kellogg, 2008). When generating content, the writer's existing knowledge relative to the topic, as well as his/her intended audience and the genre of the text to be written all contribute to the selection of content to write (Hayes, 2012). Various kinds of knowledge, as are stored in long-term memory, are then activated in working memory in order to select the most appropriate items (Hayes & Nash, 1996; Limpo & Alves, 2018). In particular, knowledge of and familiarity with the genre (i.e. structure, purpose of communication, specific cultural norms, etc.) provide indicators that facilitate the author's decisions about his/her rhetorical aims and the ideas that are appropriate to select (Bereiter, Burtis, & Scardamalia, 1988; Galbraith, Ford, Walker, & Ford, 2005)

The second sub-process of planning writing such is organizing ideas is a consequence of the first. Once the writer have selected the content, it becomes necessary to structure the ideas according to a specific hierarchy and by choosing how to consolidate the information (Kellogg, 2008). Writer's decisions about the order of content enunciation have to be taken, which could be through diagrams, schemes, notes or outlines. In these organizing processes during writing, several levels of detail can be displayed (Hayes & Nash, 1996) from the general structuring, presenting only a cluster of some ideas, to a very detailed plan integrating each of the general and specific ideas to write (Galbraith et al., 2005).

According to Harris et al. (2009) and Zimmerman and Risemberg (1997), writing processes such as planning require cognitive and metacognitive mechanisms. That is, the planning of writing is

not only an expression of those cognitive skills implied in generating content and organizing ideas. Following the socio-cognitive approach developed by these authors, the planning of writing is also a process wherein writers must consider all the factors that could affect his/her writing performance (i.e. expectations of the intended reader, the personal time and effort necessary to plan the text, the favourable physical conditions to do so, etc.). This information, about which writers could become aware before or during planning, may facilitate the engagement of self-regulated processes aiding in task success.

### ***Metacognitive processes of writing***

Metacognition has been traditionally considered as “cognition about cognition” or “thinking about thinking” since the seminal John Flavell and colleagues’ theoretical contributions during early 90 (Dinsmore, Alexander, & Loughlin, 2008). This primary definition of this term emphasises the distinction between, on the one hand, knowledge about cognition and, on the other hand, regulation and control of cognitive activity (Harris et al., 2009). More recently, authors have supported this distinction, for example relative to writing domain (Tobias & Everson, 2009), and other studies have demonstrating the bi-dimensional nature of metacognition (Akyol & Garrison, 2011; Neuenhaus et al., 2010; Schraw & Dennison, 1994; Schraw & Moshman, 1995; Young & Fry, 2008). Thus, this categorization has indeed been traditionally acknowledged in the researches about metacognition domain (Schneider, 2010; Veenman, Hout-Wolters, & Afflerbach, 2006). Metacognitive knowledge concerns the personal knowledge about different variables – personal factors or aspects relative to the task and one’s own cognitive functioning – that participate in various stages of the activity (Schoonen et al., 2003; Trapman, van Gelderen, van Schooten, & Hulstijn, 2018). Self-regulation, on the other hand, refers to strategies tending to manage the action integrating planning, monitoring and self-evaluation processes (Harris et al., 2009; Mason & Graham, 2008).

This bi-dimensional vision of metacognition is different from another conceptualisation that considers metacognition as part of self-regulatory processes. Some researchers (Efklides 2011; Efklides & Misailidi, 2010; Schunk & Zimmerman, 2007), in this regard, define metacognition in

relation to the monitoring of action. According to Efklides and Misailidi (2010), metacognition is reflected in the metacognitive knowledge that, playing a monitoring function, informs the person about task demands and the progression of his/her cognitive processes. This view is similar to that of Zimmerman and Moylan (2009), who associate metacognition with the performance phase of the self-regulation process, during which metacognitive monitoring (or self-monitoring) provides a ‘mental tracking of one’s performance, process and outcomes’ (p. 303).

The main distinction between the first view of metacognition (defined as integrating both knowledge and regulation of cognition) and the second perspective (which regards metacognition as part of self-regulation) concerns the nature of the processes taken into consideration. In fact, according to Dinsmore et al. (2008), research focused on the term *metacognition* has a clear cognitive orientation, while the literature centred on studying *self-regulation* consider various dimensions other than cognition (i.e. behaviour, environment, emotion, and motivations). This second view is a broader perspective, wherein the interaction between human and environment plays an essential role. If, on the one hand, an individual’s cognition is at the beginning of an action (cognition-centred or metacognitive perspective), on the other hand, the mutual relationship between the environment and the individual could also generate human actions mediated by motivational and affective dimensions (self-regulation perspective). Although these two theoretical visions tend to be different, there is not really an opposition between them, given that the strong overlapping of these concepts in the literature (Dinsmore et al., 2008; Harris et al., 2009).

The present research adopts the bi-dimensional approach (that considers metacognition as two interdependent components: metacognitive knowledge and self-regulation. This view seems, to us, relevant because it has been empirically and theoretically substantiated; further, we consider it also useful in regard to the human activity studied: writing (that requires consideration, not only of the individual’s knowledge about and awareness of their own processes, but also what methods they apply to accomplish the writing task).

Metacognitive knowledge of writing involves personal considerations about the audience's expectations, the kind of text, the writing strategies (one's own and also those of others writers such as peers or the teacher) and the adaptation of those according to the writing situation (Graham, Harris, & Mason, 2005; Schoonen et al., 2003). There seems to be a consensus on a classification of metacognitive knowledge in three main categories (Harris et al., 2009; Pintrich, 2002; Sperling, Howard, Miller, & Murphy, 2002): *declarative knowledge*, which is relative to personal characteristics, e.g. the writer integrating one's own strengths and weaknesses, and to the task's specificities. *Strategic knowledge* includes knowledge about the strategies that individuals might use to develop a set of common activities. And *conditional knowledge* reflects knowledge related to the specific occasions where it is convenient to use specific strategies according to the task requirements. Studies have found that training students to develop these kind of knowledge improve the writing performance (Graham, Gillespie, & McKeown, 2012; MacArthur & Philippakos, 2013).

Self-regulation strategies of writing concern a set of cognitive, affective-motivational, behavioural and environmental processes that writers display in order to readjust their writing activity as they write (Harris et al., 2009; Schunk & Zimmerman, 2007; Zimmerman & Risemberg, 1997). Zimmerman and Risemberg (1997) classified self-regulation writing strategies into three categories: *Personal (or covert) self-regulation*, which aims to adjust the cognitive or affective strategies, e.g. changing self-evaluation standards to increase the personal interest in the task. *Behavioral self-regulation* consists in adapting one's own motoric behaviour according to the self-perceived action results during writing. And *Environmental self-regulation* refers to the modifying of the context where the writing task is taking place. Some self-regulation writing strategies are self-monitoring (recording the results of the processes engaged during learning), goal setting (organizing the aims and the successive actions to be carried), seeking help (asking pairs, tutors, or teachers to help solving problems), structuring the environment (organizing the writing context to effectively write) and the mental imagery (creating mental image during writing to simplify the written production).

Among these metacognitive components, the present study examines key categories of cognitive process – covert self-regulation, environmental self-regulation, and conditional

metacognitive knowledge – that certain researchers have related to the improvement of writing performances. In fact, Harris et al. (2009) mention mental imagery and environmental self-regulation as self-regulation processes that would be suitable for training writers, notably in the case of younger or few experts writers. The same authors base their proposed self-regulated strategy development (SRSD; Mason, Harris, & Graham, 2011) on direct and explicit teaching of procedural and conditional metacognitive knowledge – knowledge elements they as essential for encouraging writing self-regulation. Our choice of metacognitive dimensions to measure is thus related to education funding. We were especially interested in the contemporary context of higher education, where students must learn new writing skills. Given the massification of the universities, students need to become autonomous by managing the environmental resources to which they have access, practicing mental strategies for planning academic tasks, and constructing knowledge about efficient strategies as can facilitate meeting of the various task requirements. These extremely diverse forms of writing constitute one of the most exigent characteristics of the academic learning environment – one that engenders significant difficulties for university students (Delcambre & Lahanier-Reuter, 2010). To construct knowledge about when and why use strategies for planning writing, according to the specific task aims, becomes a highly salient ability in this described context. Also necessary is requesting the human and informational resources, as may be available in the writing context, in order to achieve success.

### **Research purposes**

Given that the European system of Higher Education is characterized by considerable massification, it seems necessary to identify the student competencies required in different disciplinary programs by specifically describing their strengths and weaknesses in a field as fundamental as writing. Consequently, this study aims to develop and validate a self-report instrument for providing a measure of some metacognitive processes implied in writing planning by students enrolled in different university disciplines, in particular in Human and social sciences and Language. Then, the present research seeks to contribute to a field of research which, as previously highlighted (Thomas, Anderson, & Nashon, 2008), has mainly used questionnaires as a method of research to explore

metacognition in relation to different activities of learning. This validation process can help clarify certain conceptual problems about metacognition that have been highlighted by other researchers, such as unclear definitions (Veenman, Hout-Wolters, & Afflerbach, 2006). We hope that our research can facilitate reaching agreement on appropriate ways to conceptualize and measure this term, particularly in the writing domain. Adequately assessing what the instrument is measuring is essential to using it in higher education. It is important to know how it applies to real-world students learning to write academic prose, and to examine the correlations between metacognition and performance.

It is important to emphasize that self-report inventories measure individual perception about knowledge and personal strategies, in other words, the ability of individuals to acknowledge their metacognitive characteristics. Consequently, this kind of instrument does not directly study the metacognitive processes at work during an activity. According to Veenman, Hout-Wolters, and Afflerbach (2006) self-report inventories on metacognition are off-line methods that explore aptitudes or beliefs requiring a personal retrospective or prospective description of metacognitive processes. A particular contribution of this method is to highlight the personal awareness about cognition which could affect future individual learning performances (Schraw, 2010). From an educational point of view, instructors can use self-report inventories to help learners self-inquire during a writing action and thereby make appropriate decisions about strategies to apply that will lead to success (Boekaerts, 1996). In this regard, the development and validation of the instrument presented in this study could contribute to new pedagogical practices in higher education, in that teachers will be able to apply a new instrument toward deepening students' knowledge relative to their own functioning in academic writing.

## **Methodology**

### ***Participants***

1022 undergraduates students engaged in various programs of a French university located in the southwest of the country filled in the inventory. Their average age was 20 and we had mainly female participants (82%). The participants were first-year (55%) and third-year (45%) students. We

chose to test the instrument at two different levels of study at university because the inventory should be able to discern differences and similarities between students who have just started in higher education and those that already have some learning experience in this context. Additionally, as mentioned in the Aims of Research section, the inventory was designed to be usable in disciplines integrating the human and social sciences and language areas. Consequently, participants were students enrolled in psychology (63%), sociology (3%), English (14%) and other foreign languages (19%). As a minority of the students (3%) did not respond to some items, they were not included in the final sample, composed of 995 individuals. The data was randomly split into two because two stages (i.e. construction of the inventory and testing its validity) were distinguished for examining the inventory's characteristics. The first group was comprised of 497 participants and the second group of 498 individuals.

The participants were contacted directly in their classrooms, which were randomly selected, and they accepted to fill in the document anonymously and on a voluntary basis after the researchers briefly explained the aim of the study. The questionnaire was administered collectively, and the students spent between ten and twenty minutes to answer all the questions.

### ***Procedure***

The development of the Metacognitive Components of Planning Writing Inventory (MCPW-I) was carried out in two main stages: 1) Inventory construction, and 2) verification of its reliability and validity. During the inventory construction, items were created based on Zimmerman and Risemberg's (1997) theoretical background about self-regulation writing, and Raphael et al.'s (1989) classification relative to metacognitive knowledge of writing. Then, the inventory verification stage checked the factor structure of the MCPW-I using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) in order to determine the properties of the inventory.

### *First stage: construction of the MCPW-I*

An initial version of items was formulated based on three main theoretical categories: Conditional metacognitive knowledge, Covert self-regulation and Environmental self-regulation. In order to ensure content validity of the instrument, following Haynes, Richard, and Kubany's (1995) recommendations, we identified clear indicators relative to these three categories, based on the theoretical definitions and empirical data reported by Zimmerman and Risemberg (1997) and Raphael et al. (1989). We first generated a preliminary version; then we asked three experts on metacognition to review it, with the aim of critiquing: (a) the items' relevance, (b) the appropriateness of words used, and (c) the examples given to illustrate the writing situations. For item generation, we observed three criteria: (a) the utilisation of verbs related to 'knowledge', for example, 'to know', 'to be aware', or 'to acknowledge', in order to indicate the metacognitive knowledge; b) the use of verbs referred to 'actions' that allowed us to denote the self-regulation component; and (c) the presence of the personal pronoun in the first person for each item

The first category of items concerns the knowledge of students about the use of specific writing methods according to task requirements or the kind of text to produce. The second one integrates strategies used by the writer for regulating his or her emotions or cognitive processes during writing. In the present inventory, strategies such as visualization of ideas in the mind prior to writing, inner thought and the repetition of ideas in one's mind are specially addressed. And the last category of items aimed to identify the perception of individuals about their methods to cope with the context in which they produce the academic texts, in particular the social resources that they have in their environment (peers, teachers, other contacts).

From the first version, we conducted a pilot study in order to test the items' clarity and comprehensibility. Twelve students randomly selected, who were enrolled in psychology and sociology courses, were asked to fill in the inventory. They agreed to participate in a group interview that aimed to review their perception of specific terms such as type of task, writing task and writing methods. We did our best to avoid ambiguous formulations in the instrument. This pilot study allowed

the researchers to recheck the content validity (i.e. the appropriateness of items' presentation, the specificity and clarity, the relevance of situations choose) and to ensure a correct comprehension of items and main terms used. Table 1 shows all the details of the initial version of MCPW-I. This is a self-report questionnaire to be filled face to face. Each item describes a writing strategy for planning texts, and the individuals have to answer by identifying the extent to which the mentioned strategy reflects their writing methods. More specifically, participants were asked to rate the frequency of each situation described on a seven-point Likert scale (1= never; 2= very rarely; 3= rarely; 4= sometimes; 5=frequently; 6= very frequently; 7= always). Participant's responses were scored by regrouping the items in each category (subscale). A total score was obtained for each factor subscale by adding the raw scores for each item in the subscale. Accordingly, students obtaining higher scores in a certain category indicated a higher frequency of concerned strategies. The inventory was presented in French, the respondents' native language. The original French version of the instrument is available in Appendix.

Table 1 near here

#### *Second stage: examination of validity and reliability*

First at all, an exploratory factor analysis (component principal) in SPSS 22 was conducted in order to assess the construct validity. It was considered necessary to test the relationships between the items and the factors with which a correspondence was supposed to exist. According to an exploratory perspective, no specific number of factors were asked when the extraction factors procedure. Oblique rotation method was used as there, according to the aforementioned theoretical, an interrelationship between the metacognitive components was assumed. According to Pett, Lackey, and Sullivan (2003), this method can particularly be adapted to social science, wherein human processes are frequently interconnected; as such, it allows identification of independent factors which also can serve as interrelated factors. Being consistent with this view, we did not use the orthogonal rotation method given that this approach results in a "loss of valuable information if the factors are correlated (...)"

(Costello & Osborne, 2005, p. 3). Following these last authors, in the case where the factors are uncorrelated, oblique and orthogonal produce nearly the same results.

The internal consistence of factors founded then was determined by the Cronbach coefficient. Tavakol and Dennick (2011)'s recommendations were taken into account make an appropriate interpretation of this test. Having examined the dimensions of the instruments through the factor analysis, the alpha calculation was useful to confirm whether or not the specific samples of items identified are actually unidimensional. Finally, this stage aimed to remove some items that could show an ambiguous relationship with the dimensions to which it belonged and then to ensure the reliability of the inventory.

Afterwards, a confirmatory factor analysis (CFA) was developed using the R Software (R version 3.3.0, R Core Team, 2014) to examine whether the proposed model from the exploratory factor analysis provided an adequate structure, reliability and validity. We observed the parameters of factor loading on each of the items and the loading of the general factor on the first-order factor in order to determine if each dimension has distinct covariance. Additionally, specific and commonly used indexes were retained, which will be presented in the results section. Correlation tests between the factors found were conducted in order to better understand the interrelationship between the metacognitive components measured by the MCPW-I.

Aside from the aforementioned reliability and validity test, the present study determined the convergent validity of the MCPW-I by correlating its results with those of an existent inventory. Given that there does not exist a validated self-report inventory which specifically measures metacognition in writing, we chose the WSQ2 inventory (Kieft, Rijlaarsdam, & van den Bergh, 2008), a questionnaire about university students' writing strategies that identifies two items categories: planning and revision. This questionnaire contains 26 items, which ask the students to rate how much they agreed with each sentence on a 5-point scale. Examples of items regarding revision are: 'When I write a text, I find it difficult to form ideas about which I can write', or 'When I know what to write globally, I write my

texts very easily'. On the other hand, items about planning are, for example: 'When I start writing, I do not know what the content of the text will be'. Given the nature of the MCPW-I, only the planning items were considered. As with our instrument, some items of the WSQ2 Planning scale are related to what the writer self-reported doing or knew before starting to write.. Other sentences mention behaviours such as "use a diagram" or "jot notes" that are close to some strategies described in MCPW-I (i.e. Covert self-regulation strategies).

We examined test-retest reliability by calculating the ICC coefficient. The instrument was administered a second time four months later to 50 students who had filled out the questionnaire the first time. This procedure was useful to determine the temporal stability of the results and to indicate whether some metacognitive variables could be affected by the passage of time (new students' experiences, specific content learned at the university, etc.) Finally, we examined predictive validity by computing the correlation between the questionnaire scores and writing performances. A group of 50 students was asked to produce a written text – a synthesis whose subject and specific constraints were formulated by the researchers – during a precise time and in a fixed place (see the writing task in appendix). Each participant wrote a text individually following completion of the questionnaire. The topic selected for engaging the students in writing was related to their study area. In fact, the participants were first-year students in social and economic management. For facilitating their writing processes, we choose a topic considered easy to understand for first-year students. We asked some teachers belonging to the pedagogic staff in the concerned area of study to choose a subject linked to social and economic subjects. Then, two trained judges assessed the texts produced by using a rubric of evaluation that we partially constructed from Escorcía et al.' (2017) instrument for measuring writing performance. This initial instrument, designed by the researchers for assessing synthesis, was slightly modified in order to attain the constraints of the writing task in the present research. We asked these consultants to produce a short answer that was similar to a synthesis (in that it was necessary to select precisely some information from the text read); however, the writing task in the present study did not require to comparing content from several sources. Consequently, we selected almost all items from the Escorcía et al.' (2017) instrument, except the one involving comparison of content from a

range of sources. Then, our final rubric of evaluation contained five criteria: text structure, coherence, content relevance, formulation quality, and linguistic aspects (i.e. grammar and spelling). We calculated the rate of agreement between the two judges (intraclass coefficient correlation- ICC). For each criterion, they were asked to rate the quality of the texts on a 4-point scale. Finally, a Pearson correlation coefficient was computed between questionnaire scores and scores on the writing assessment.

#### *Determining differences between the students' metacognitive dimensions of planning*

Finally, Multivariate analyses of variance were displayed in order to determine whether differences exist between the MCPW-I scores according to gender and discipline.

### **Results**

The results will be presented in four sections. The first two will respectively present the outcome of the EFA and the CFA. The third section details the findings relative to convergent validity and the final section presents data about the differences between students' MCPW-I scores according to gender and academic program.

#### *Exploratory factor analysis*

We conducted the EFA following a common factor approach by using in particular the method Maximum likelihood given that assumption of data normality was respected. The results of the exploratory factor analysis show a good KMO coefficient (.77), indicating correct sampling adequacy. Barlett's test of sphericity was significant ( $p < .001$ ) which means that all the variables are completely independent of one other. Additionally, the results indicate that variance accounted for 50%. Table 2 presents the communalities for the items, which ranged from .55 to .81. Fifteen items were finally retained - from the seventeen initial statements - and reduced to a three-factor scale. Our criteria for retaining items were a) to have a communality score higher to .40 on the factor, and b) to identify items that only load on one factor. Respecting these criteria, item 1 and 16 were eliminated. Inspection

of the scree plot (Figure 1) suggests also that the three-factor explanation is adequate because the number of data points before the “break” – not including the point at which the break occurs following Costello and Osborne (2005)’s recommendations – is three. This structure seems adequate given that the communalities corresponding to common magnitudes in social sciences ranged in general from .40 to .70. In this study, all the communalities found were higher than .40. Otherwise, no item was crossloaded on two or more factors and the number of items per factor was higher than 3 contributing to the strength and stability of factors. The three factors represent the latent variables that we have already assumed during the inventory construction stage: Conditional Metacognitive Knowledge (CMK), Convert self-regulation (CSF) and Environmental self-regulation (ESR).

Table 2 near here

The alpha coefficient was higher than .70 for CMK and ESR subscales, and lower for CSF a subscale, however the latter remains above .62 as recommended (Nunnally, 1978) (Table 2). This will be the model considered throughout confirmatory factor analysis. Descriptive statistics for each item used in the study are presented in Table 3. To examine whether there is a normal distribution of data, Skewness and Kurtosis were used. Following George and Mallery (2010), who considered skewness and kurtosis values between -2 and +2 as acceptable, our data did not present any problem.

Table 3 near here

### ***Confirmatory factor analysis***

The CFA estimations were carried out using the maximum likelihood (ML) algorithm, included in the R software. The parameters of the factor loading on each of the items and the loading of the general factor on the first-order factor revealed both distinct covariance structures for the specific dimensions considered (Figure 2). This result confirms the factorial structure revealed by the EFA, which contains three different identified factors. Some other characteristics of data should be considered in order to judge the fit of the data to the model. Table 4 presents goodness-of-fit indexes

of the model that are commonly used in the field. A non-significant Chi-square test indicates good fit. However, it is known that this test is sensitive to sample size (Marsh, Balla & McDonald, 1988; Maruyama, 1998). For this reason, another related statistic has been proposed by Wheaton, Muthen, Alwin and Summers (1977): the relative/normed chi-square ( $\chi^2/df$ ). This index must be below the ratio 5:1 (Marsh & Hovecar, 1985). Other indicators with thresholds have been proposed in the literature: acceptable values of CFI and NFI should be above .90 (Hu & Bentler, 1999; Bentler & Bonnet, 1980), NNFI (also known as TLI) values greater than .95 are reasonable (Hu & Bentler, 1999), RMSEA values below .08 are considered as acceptable (Byrne, 2001; Raju, Lafitte & Byrne, 2002), or even below .07 (Steiger, 2007). Finally, GFI values higher than .90 and PGFI values higher than .50 indicate good model fit (Byrne, 1998; Gefen, Straub & Boudreau, 2000). Overall, the results in table 4 indicate that the goodness-of-fit of our model is largely acceptable given that the majority of these criteria are respected.

Figure 2 near here

Table 4 near here.

Finally, table 5 presents the inter-correlation matrix among the three categories of metacognitive components of planning. This result reveals that all correlations found reached a significant level of .01. A positive correlation exists between Metacognitive Conditional Knowledge and Covert Self-regulation, as well as among the latter and Environmental Self-regulation. However, this is not an inter-correlation between Metacognitive Conditional Knowledge and Environmental Self-regulation. We will discuss this finding later.

Table 5 near here.

### ***Convergent validity, predictive validity and test-retest reliability***

126 participants from the sample filled the WSQ2 inventory. In order to establish the correlation between MCPW-I and WSQ2 scores, we only took into consideration the planning items

results from the latter inventory. This calculation of the Pearson test showed a moderate correlation at .25 to be significant ( $p < .01$ ). However, examining specifically the sub-scales, there were not correlations: CSF( $r = .17$ ;  $p > .05$ ), MCK ( $r = .02$ ;  $p < .001$ ), and ESR ( $r = 1.21$ ;  $p > .05$ ).

Correlations between the questionnaire scores and the writing performances (obtained from the evaluation of texts written by the students) revealed a positive and significant relationship between the writing performance and MCK ( $r = .25$ ,  $p = .02$ ) and CSF ( $r = .30$ ,  $p < .01$ ). The results related to ESR indicated an absence of correlation ( $r = -.05$ ;  $p > .05$ ). Finally, concerning test-retest reliability, the ICC coefficient was .74, with a 95% confidence interval of .54 - .85. For the specific dimensions of the questionnaire, the ICC coefficients and 95% confidence intervals were .49 (.39-.82) for the CSF scale, .72 (.51 - .84) for the MCK scale, and .58 (.27-.76) for the ESR scale. Table 6 shows the descriptive data from this test

Table 6 near here

### ***Differences of gender and academic program***

Table 7 shows that there is not a variability between the sociology, psychology, foreign language and English students regarding the three MCPW-I subscales. Analysis of variance does not reveal significant differences for the inventory factors: CMK ( $F(3, 49) = 1.70$ ,  $p > .05$ ); CSF ( $F(3, 49) = .97$ ,  $p > .05$ ); ESR ( $F(3, 49) = .70$ ,  $p > .05$ ). In contrast, table 8 presents some differences between men and female. Analysis of variance does show a significant difference between the two students group concerning two MCPW-I factors: ESR ( $F(1, 50) = .6.9$ ,  $p = .01$ ) and CMK ( $F(1, 50) = .59$ ,  $p = .02$ ). The mean scores exhibited by female are higher than the male mean scores with respect to these two dimensions.

Table 7 near here

Table 8 near here

## **Discussion**

The main purpose of the present study was to construct and validate a self-report instrument about the metacognitive components of planning writing. Data analysis indicated that the Metacognitive Component of Planning Writing Inventory (MCPW-I) reveals a satisfactory factor structure, reliability and validity measures. This instrument contributes to a series of existent self-report instruments on metacognition by specifically allowing the exploration of the writing domain, and by clearly defining the metacognition from a bi-dimensional perspective which identifies the knowledge about cognition and the regulation of cognition as being two separated categories of processes. The resulting MCPW-I consist of three factors: Metacognitive Conditional knowledge, Covert Self-regulation and Environmental Self-regulation. The factors found and the analyses relative to the differences between the participants deserve further consideration.

The three factors confirm that metacognitive knowledge and self-regulation strategies are two independent components of metacognition and the fidelity results showed that each factor exhibited good internal consistence. Other research studies have already considered the bi-dimensional nature of metacognition, funded both on theoretical propositions (Schneider, 2010; Veenman, Hout-Wolters & Afflerbach, 2006) and empirical data in other fields than writing (Akyol & Garrison, 2011; Neuenhaus et al., 2010; Schraw & Dennison, 1994).

Otherwise, the findings confirm that two categories of self-regulation strategies identified by Zimmerman and Risemberg (1997), covert self-regulation and environmental self-regulation, constitute two distinct dimensions which can be operationalized to a set of specifics writing behaviours. It is a key contribution given that the abovementioned authors supported their categorization on interview and observation methods but not on results from self-inventory instruments. Thus, the MCPW-I makes it possible to bring to light cognitive and environmental processes that university students acknowledge regarding their manner of regulating their writing activities in academic contexts.

Environmental self-regulation concerns a set of strategies necessary to succeed in writing and involving the writers being able to modify their context or to look for appropriate models or resources

to achieve their aims (Risemberg, 1996). Moreover, these strategies are correlated with cognitive self-regulation strategies such as rehearsing and memorising (Nota, Soresi & Zimmerman, 2004). Items of the MCPW-I such as (8) *I discuss with my peers in order to identify the ideas that I will write* and (6) *I ask someone to read the plan of my text in order to make sure that it is clear* indicate whether the writer remains alone facing writing challenges and whether she/he is aware about how environmental resources can be useful.

On the other hand, covert self-regulation is here related to mental planning through rehearsing ideas and mental outlining, for example (9) *I repeat in my head the ideas to write when I am reflecting about the organization of my text* and (14) *I make a checklist of all my ideas in my head before writing*, which could contribute to improve writing performance. After having trained college students to use this kind of strategies, Kellogg (1988) found that the individuals wrote better quality texts considering language use and idea development; equally, these students spent less time for revising seeing that the mental outline reduced cognitive efforts during this writing process.

Additionally, the MCPW-I provides information about the students' metacognitive knowledge related to when to use the writing strategies according to the aims and requirements of the writing task. Note that, as mentioned in the Research Purpose section, that this kind of instrument does not measures the behaviours actually performed by the persons in actual tasks but, rather, their reported strategy employment. However, this kind of individual knowledge could constitute an interesting basis for instruction. Studies have demonstrated that training individuals to acquire metacognitive knowledge about the utilization of strategies in specific writing contexts positively affects their writing performance. That was found to be true in the case of young pupils (Graham, Harris, & Mason, 2005) and college students (MacArthur & Philippakos, 2013). These findings are consistent with other results demonstrating that the more efficient writers exhibit higher scores of knowledge relative to the tasks and the strategies (Escorcía & Fenouillet, 2011; Ferrari, Bouffard, & Rainville, 1998). Items such as (2) *I know what are the advantages of my writing strategies depending on the kind of writing task that I have to make* and (5) *I know what are the writing strategies to employ depending of the kind of*

*writing assignment* reflect both the taking into account of the writing task's requirements and the acknowledging of the advantages of strategies according to the task.

Otherwise, the validity results of the MCPW-I revealed the factors found reflect the extent to which the students acknowledge their own conditional knowledge and strategies to self-regulate their cognitive activity and their environment during the generating and organizing of ideas. For example, covert self-regulation factor contains items such as (9) *I repeat in my head the ideas to write when I am reflecting about the organization of my text* and (13) *I connect my ideas with some key words that flow in my head before writing* refer to how new ideas are produced and how the retrieved content is put in order by managing mental processes (e.g. rehearsing, mental outlining).

Concerning the correlation among the three metacognitive components of writing, the findings indicated that the metacognitive conditional knowledge and the covert self-regulation are inter-correlated. Nevertheless, no correlation exists between the conditional metacognitive knowledge and the environmental self-regulation. Concerning the relationship between the two dimensions of metacognition, several authors (Boekaerts, 1996; Schraw & Moshman, 1995) have argued that those are dependent. However, evidence has failed to confirm this dependence (Escorcía & Fenouillet, 2011; Mongeau & Hill, 1998), showing, for example, that metacognitive knowledge appears as being a prerequisite for the self-regulation strategies but the former does not ensure strong self-regulated functioning (Schraw, 1994). According to these findings, the current results confirm that the correlation among the two metacognitive components is complex.

Specifically, the data revealed that the metacognitive conditional knowledge explored by the MCPW-I is correlated with the managing of cognitive strategies, such as to construct a mental outline. Then the knowledge about the convenience of the strategies according to text constraints appear as a key element in the mental planning of ideas, but this kind of knowledge does not have a dependent relationship with the environmental self-regulation. Indeed, the items from the environmental self-regulation factor of the MCPW, which represents the utilization of external resources to verify content coherence, relevance and text comprehensibility, do not necessarily contribute to knowledge

about the using of writing strategies. Asking for help from colleges or teachers does not seem to be an essential condition for finding better strategies to produce a text. In other words, the environmental self-regulation factor measured by the MCPW-I is useful to identify the characteristics of text to produce but not to know how achieve the aims of the task. That is probably why the specific items of environmental self-regulation we considered were not correlated with the conditional metacognitive knowledge measured by the MCPW-I.

A last key result concerns the inter-individual differences about the metacognitive components of planning writing with regard to students' gender and academic program. Following previous findings (Sharma & Bewes, 2011), this study confirmed that, in university context, females and males are different concerning their self-perception of metacognitive processes. Other studies have already confirmed this difference between younger individuals (Ciascai & Haiduc, 2011; Veenman et al. 2014) concerning different learning domains. As regards writing, this difference can be explained by a stronger tendency of females to show better language competencies than males, as well as a higher self-perception of skills in this domain. Findings about children and young pupils have demonstrated that girls perform better than boys for grammar, spelling, and text comprehension (Viriot-Goedel et al., 2009) and that, for them, language-based courses at school have more importance than for boys (Bouffard, Vezeau & Simard, 2006). However, this disparity in the results relative to ESR and MCK dimensions could also be related to the preponderance of the women participants in the sample. An equal proportion of the two genders – which implies covering academic disciplines where the boys are more present – could allow to test this assumption in subsequent studies.

Concerning the differences related to the study program, in contrast, there were no differences between Psychology, Sociology, Foreign language and English students. This finding can be explained by common practices of academic writing that could characterize these academic programs. For example, psychology and sociology both belong to Human and Social sciences. Then, these academic programs appear as being very close, where probably the students face similar writing constraints, types of assignment and teaching practices. The same goes for English and Foreign languages because both belong to the language field. Then, it is likely that their analogous writing experience encourages

no fundamental differences regarding the students' self-perception of knowledge and strategies to writing academic texts. Additionally, these results showed that the MCPW-I measures general knowledge and strategies which seems not to be affected by contextual specificities relative to the disciplines considered. We point out, however, that our validated instrument does not address a specific kind of writing task or any genre of text. Probably, differences exist between the students' metacognitive knowledge and self-reported strategies relative to the function of the specific writing task. This question could be considered in further research.

Regarding the correlation of MCPW-I score and planning items of the WSQ2 inventory (Kieft et al., 2008), a certain level of correlation was found when the global score from the MCPW-I was used. Thus it is possible that the two instruments have a common fundament in terms of what they measure in the sense that both concern the writing activity. However, given that the specific metacognitive dimensions of the MCPW-I were not linked to the WSQ2 inventory, we can conclude that these instruments do not measure exactly the same strategies and that other instruments – related to metacognition in similar domains to writing like reading or comprehension – will be necessary to re-examine the concurrent validity of the MCPW-I. Indeed, the WSQ2 inventory does not comprise items about knowledge pertaining to writing constraints or teacher expectancies, nor does it ask about the strategy consisting of asking help from colleagues or teachers to improve the quality of texts; mental strategies not are either mentioned.

Test-re-retest reliability was good – following the quoted guidelines for interpretation recommended by Cicchetti (1994) – when we examined the overall score on the MCPW-I. The results related to each dimension showed that covert self-regulation strategies scores were less stable over time, probably because the mental strategies measured are more affected than metacognitive conditional knowledge and environmental self-regulation are affected by the learning experiences in the university contexts. A stronger effort toward autonomy by the students all along during the first semester in higher education could lead them to engage other approaches to plan their written production, especially during selecting and organizing ideas. For example, a more important quantity or diversity of written assignments in university – compared to the written tasks in high school - could

induce writing procedures without enough reflection involving mentally preparing before the task given that the students have not much time to face all the constraints linked to their university students' life.

Finally, the predictive validity indicated by the correlation between writing performances and MCPW-I scores indicated that conditional metacognitive knowledge and covert self-regulation can constitute signs about the students' competence to produce written texts responding to the requirements of writing in university contexts. This is in agreement with previous findings about the relationship between metacognition and performance in different domains of learning. Although the correlations were not very high, these data highlight the relevance of training students in order to facilitate a) the construction of knowledge about the efficacy of planning strategies in the task environment and b) the acquisition of systematic mental strategy before writing. Future studies should examine this correlation by taking into consideration ecological tasks. This setting could better reflect the link between the metacognitive components considered and writing performance. Relative to environmental self-regulation, this dimension was not correlated with.. The strategy consisting of self-selecting models – such as tutors or pairs – in order to acquiring/develop knowledge or skills for writing achievement, is probably not sufficiently encouraged in the studied context where writing is practiced as a solitary activity depending mainly on the personal abilities of the writers.

## **Conclusion**

The results confirm the validity and reliability of the MCPW-I which constitutes a new research tool in the metacognition domain. Specifically, this self-inventory allows much finer-grained comprehension of the strategic knowledge and self-regulation processes that university students perceive within their activity of planning writing. Throughout the validation processes described in this paper, we could construct a questionnaire integrating dimensions that are clearly identified. This is a key condition for use of instruments in educative contexts, particularly in higher education where the massification requires one to use reliable and valid tools able to describe the characteristics of a large number of

individuals. In consequence, the contribution of the present validation study is both conceptual and practical. The instrument proposed can be used particularly among the students enrolled in different Human and Social Sciences, and Language academic programs. Then, the MCPW-I allows for a certain diversity in higher education but it seems necessary to test it in other more different academic program, such as Medical or Technology study programs.

In the context of research about the writing processes of university students, the MCPW-I constitutes an off-line method that provides a personal description of metacognitive processes, and this method could be combined with on-line measures. In this sense, the instrument proposed could support the data triangulation that, according to Schraw (2010), represents an important stage for demonstrating the reliability of results about metacognition and self-regulation processes.

From an applied viewpoint in education domain, teachers and tutors in higher education could employ the MCPW-I as a means to identify the extent to which the students, mainly those who have just started university in their first year, acknowledge their knowledge and strategies for writing. This information provides interesting indications about the writing experiences of students involved in different academic programs, and that could facilitate the construction of adapted teaching writing programs aiming to improve student performance. Writing training programs such as those proposed by Graham, Harris and Mason (2005) and MacArthur and Philippakos (2013) have been demonstrated to be a positive effect on writers' performance. In this context, using the MCPW-I could leads trainer (whether tutors or teachers) to obtain deep and precise knowledge relative to the metacognitive knowledge and self-regulation strategies that the pupils self-perceived related to their writing planning practices. This information constitutes indicators about the pupils' learning experiences related to academic writing, and consequently the trainers could put in evidence strengths and weakness of the students. Certainly this is a key support for the making decision during the construction of pedagogic actions aiming to teach academic writing. The contribution of questionnaires is habitually acknowledge as a relevant tool into the education field for teachers and pedagogic teams, but using validated instruments such as the MCPW-I brings a stronger basis for designing efficient pedagogic programs.

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Table 1. The seventeen items of the initial MCPW-I

Categories	Items
Metacognitive conditional knowledge (MCK)	(1) I know how to select the main ideas that I will develop in the written text * (2) I know what are the advantages of my writing strategies depending on the kind of writing task that I have to achieve. (3) I know how to find ideas to write (4) Before writing, I know what are the formal characteristics of the text that I have to construct (5) I know what are the writing strategies to employ depending on the kind of writing assignment (10) I know how to adapt my writing strategies to the requirements of the writing task (11) I know how to decide if it is necessary to change my writing strategies according to the task demands
Covert Selfregulation (CSF)	(9) I repeat in my head the ideas to write when I am reflecting about the organization of my text (13) I connect my ideas with some key words that flow in my head before writing (14) I make a checklist of all my ideas in my head before writing (15) I let flow my knowledge about the topic before writing (16) Before writing, I know clearly what are the sections that I will develop in my text *
Environnemental Selfregulation (ESR)	(6) I ask someone to read the plan of my text in order to make sure that it is clear (7) I use a text plan that someone recommended to me (8) I discuss with my peers in order to identify the ideas that I will write (12) I ask questions to the proofreader of my text for better knowing his/her expectations [17] I show my proofreader a draft of my text with a view to knowing his/her advice

\*Items removed after the exploratory factor analysis

Table 2. Pattern matrices of the MAPW-I

Items	MCK	CSF	ESR	<i>h</i> <sup>2</sup>
2	.67			.46
3	.60			.37
4	.60			.38
5	.76			.65
10	.79			.64
11	.78			.63
9		-.55		.35
13		-.77		.61
14		-.81		.67
15		-.60		.39
6			.75	.58
7			.63	.47
8			.68	.47
12			.57	.36
17			.70	.51
Eigenvalues	3.29	2.42	2.34	
% var	23.68	16.20	10.49	
$\alpha$	.80	.65	.70	

Table 3. Descriptive statistics for the 15-items (from exploratory factor analysis data)

	Mean	SD	Skeweness	Kurtosis
MCK				
Q2	4.18	1.25	-.26	.30
Q3	5.12	1.10	-.30	-.16
Q4	4.71	1.25	-.07	-.25
Q5	4.80	1.25	-.50	.25
Q10	4.92	1.10	-.59	.87
Q11	4.65	1.18	-.40	.27
CSF				
Q9	4.59	1.48	-.47	-.34
Q13	4.69	1.38	-.53	-.03
Q14	4.98	1.48	-.69	.09
Q15	5.36	1.23	-.72	.51
ESR				
Q6	3.29	1.91	.47	-1.02
Q7	2.54	1.32	.83	.42
Q8	4.26	1.41	-.42	-.35
Q12	3.83	1.55	-.13	-.72
Q17	2.79	1.46	.51	-.42

Table 4. Results from the confirmatory factor analysis

Model	GFI	PGFI	RMSEA	Chi-squared	<i>p</i>	CFI	TLI	DF	NFI
3-factor model	.93	.67	.06	25	$p < .001$	.89	.87	87	.85

Table 5. Correlations between factors of the MAPW-I

	Metacognitive Conditional Knowledge (CMK)	Covert Self- regulation (CSF)	Environmental Self-regulation (ESR)
Metacognitive Conditional Knowledge (CMK)	1	.31**	.01
Covert Self- regulation (CSF)		1	.20**
Environmental Self-regulation (ESR)			1

\*\*p < .01

Table 6. Descriptive statistics from test-retest calculation

Temps of questionnaire administration		Metacognitive Conditional Knowledge (CMK)	Covert Self-regulation (CSF)	Environmental Self-regulation (ESR)
First time <i>n</i> = 50	Mean	27.56	20.72	17.56
	SD	5.82	3.39	5.55
Second time <i>n</i> = 50	Mean	28.28	19.42	16.06
	SD	5.11	4.00	4.36

Table 7. Descriptive statistics for MAPW-I scales for each academic program.

Academic program		Metacognitive Conditional Knowledge (CMK)	Covert Self- regulation (CSF)	Environmental Self-regulation (ESR)
Sociology <i>n</i> = 29	Mean	26.24	19.71	17.31
	SD	3.76	4.17	6.02
Psychology <i>n</i> = 164	Mean	27.96	19.58	17.26
	SD	5.18	3.85	5.18
Foreign language <i>n</i> = 167	Mean	28.17	20.10	16.58
	SD	4.83	4.16	5.21
English <i>n</i> = 123	Mean	27.69	20.17	16.77
	SD	4.60	3.52	5.52

Table 8. Descriptive statistics for MAPW-I scales for each gender group

Sex		Metacognitive Conditional Knowledge (CMK)	Covert Self- regulation (CSF)	Environmental Self-regulation (ESR)
Female <i>n</i> = 393	Mean	28.10	20.10	17.45
	SD	4.54	3.89	5.19
Male <i>n</i> = 105	Mean	26.88	19.21	14.81
	SD	5.75	3.91	5.26

Fig. 1. Scree plot from the exploratory factor analysis

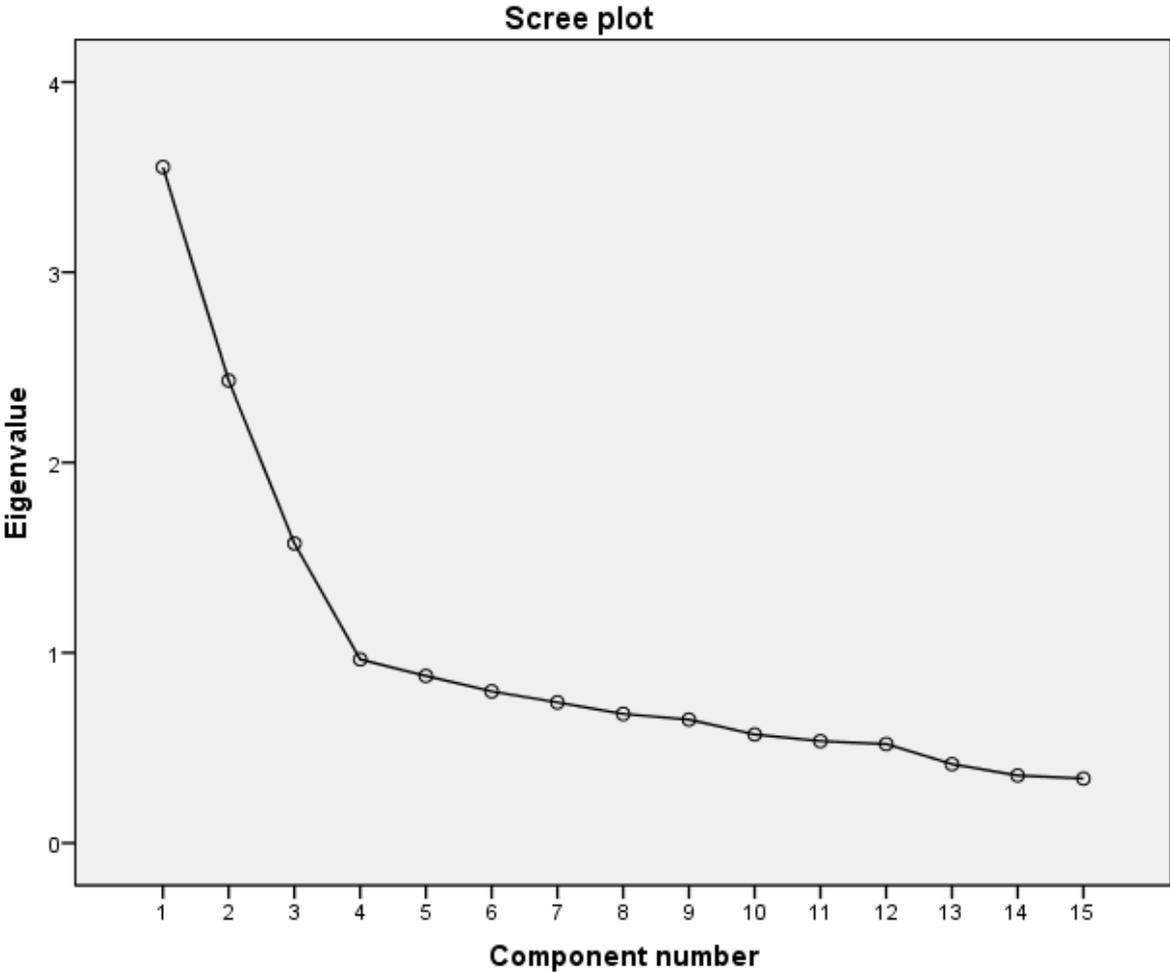
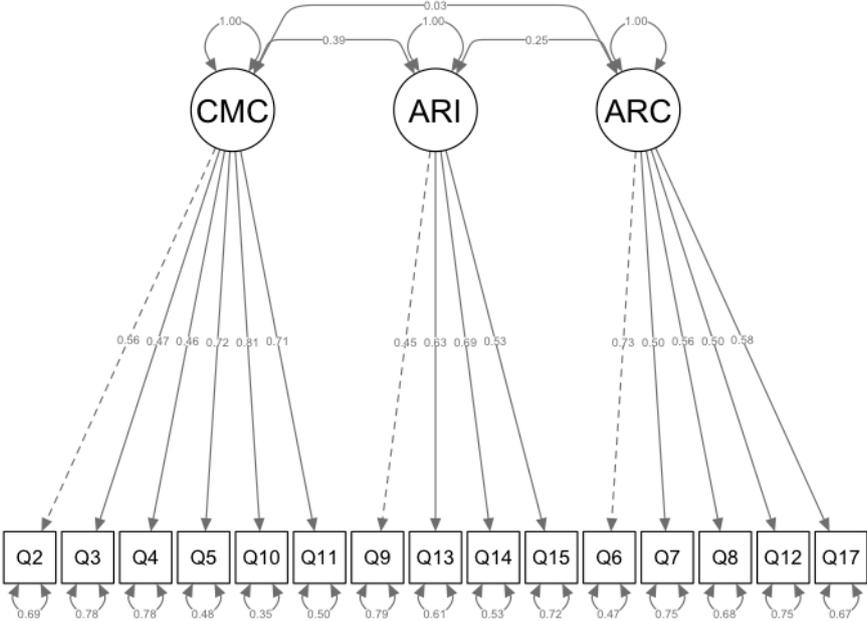


Fig. 2. The three-factor model



## Appendix

### French version of MCPW-I

Nous souhaitons connaître la façon dont vous vous y prenez pour rédiger vos devoirs (**résumés, fiches de lecture, corpus**) en dehors des situations d'examen sur table. Lisez attentivement les propositions ci-dessous et cochez un chiffre de 1 à 7 selon la réponse qui correspond le mieux à vos habitudes quand vous entreprenez la rédaction de vos devoirs. Suivez l'échelle suivante :

1 : jamais    2 : très rarement    3 : rarement    4 : parfois    5 : souvent    6 : très souvent    7 : tout le temps

Prenez le temps de répondre soigneusement à chaque question, vous disposez de 30 minutes. Ce questionnaire est confidentiel. Nous garantissons l'anonymat des données.

Diriez-vous : « **Quand je dois rédiger un devoir (résumé, fiche de lecture, corpus), avant de commencer à rédiger...** »

1. ...je sais sélectionner les idées clés à développer dans mon texte	1	2	3	4	5	6	7
2. ...je sais quels sont les avantages de mes méthodes d'écriture au regard du type de devoir que je dois produire	1	2	3	4	5	6	7
3. ...je sais trouver des idées pour écrire	1	2	3	4	5	6	7
4. ...avant de passer à la rédaction, je sais quelles seront les caractéristiques formelles de mon texte	1	2	3	4	5	6	7
5. ...je sais quelles méthodes d'écriture utiliser en fonction du type de devoir	1	2	3	4	5	6	7
6. ... je fais lire à quelqu'un le plan de mon texte pour savoir s'il est compréhensible	1	2	3	4	5	6	7
7. ... j'utilise un plan de texte qu'une autre personne m'a suggéré	1	2	3	4	5	6	7
8. ...je discute avec mes camarades afin de mieux identifier les idées que je vais mettre par écrit	1	2	3	4	5	6	7
9. ...je me répète mes idées dans ma tête pendant que je réfléchis à l'organisation de mon texte	1	2	3	4	5	6	7
10. ...je sais adapter mes méthodes d'écriture à la consigne du devoir	1	2	3	4	5	6	7
11. ...je sais déterminer s'il convient de changer mes méthodes d'écriture en fonction des exigences du devoir	1	2	3	4	5	6	7
12. ... j'interroge le lecteur/évaluateur de mon écrit pour mieux connaître ses attentes	1	2	3	4	5	6	7
13. ...j'associe dans ma tête mes idées à des mots clés qui me viennent à l'esprit avant d'écrire	1	2	3	4	5	6	7
14. ...je fais dans ma tête une liste de toutes mes idées avant d'écrire	1	2	3	4	5	6	7

15. ...je laisse venir mes connaissances sur le thème avant de rédiger	1	2	3	4	5	6	7
16. ...avant d'écrire, je sais quelles seront les parties à développer dans mon texte	1	2	3	4	5	6	7
17. ...je sou mets au lecteur/ évaluateur de mon devoir une première ébauche dans le but de connaître son avis	1	2	3	4	5	6	7

## Appendix

### Writing task

You have to write a text - composed of ten to fifteen lines- in order to answer the question:

According to D. Cohen, The *Homo Economicus* fails to attain the happiness. Explain the reasons of this difficulty.

Your written production has to be based on the text attached to the present written instructions. That is not necessary to synthetize all the content of the text, but it is recommended to select some essential elements in order to specifically produce your written answer.

It is also required to respect some basic constraints: to write a readable written text, to construct completed sentences, to use a correct spelling, and to avoid using abbreviations or symbols.

You have one hour for writing (this time comprises reading and writing activities).