Alma Mater Studiorum – Università di Bologna

Dipartimento di Scienze dell'Educazione "G.M. Bertin"

DOTTORATO DI RICERCA IN

Psicologia Sociale, dello Sviluppo e delle Organizzazioni

Ciclo XXV

Settore Concorsuale di afferenza: 11/E2

Settore Scientifico disciplinare: M-PSI/04

COMPETENCE: INTELLIGENCE IN SHEEP'S CLOTHING? CULTURE, REPRESENTATIONS, AND COGNITIVE PERFORMANCE

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Esame finale anno 2013

To Betti, Samu & Gere,
My Family.

CONTENTS

GENERAL INTRODUCTION

The general aim of this dissertation is to show how the notions of competence and intelligence, being highly relevant in the educational context, affect students achievements. In particular we will focus our attention on the cultural capital effect both on the different positions taken, and on performances. We will also study the effect of the difference in positioning as one of the causes of the variations in students performances.

Competence is not a new topic in the academic discourse (Romagnoli & Selleri, 2011). Science has discussed and still is discussing about the notion of intelligence (Nisbett et al., 2012). Nowadays the notions of competence and intelligence are systematically used (implicitly and explicitly) also in educational contexts by many actors being involved in the educational process for various reasons, at various levels, in playing different roles (i.e. students, parents, teachers, headmasters, policy makers etc.).

The term intelligence has been the first to enter educational environments (Binet & Simon, 1905). The term competence entered the same context only during the last decade (cf. European Commission, 2007; INVALSI, 2012; OECD, 2009; Rychen & Salganik, 2001). As a consequence, nowadays, almost all members of technologically advanced societies, where education is compulsory, are familiar with the notion of intelligence (Carugati & Selleri, 2011; Mugny & Carugati, 1988) and are, or are becoming familiar with the notion of competence.

We embrace the idea that becoming familiar with a specific notion entails the necessity for the individual to build and access a shared representation of that notion (Moscovici, 1976; 1981) in order to be able to communicate properly with others and to position himself/herself (Doise, 1986) toward it, as regards to its origin, characteristics, effects, and the value of being/being considered/considering themselves/proving to be/appearing intelligent and/or competent.

We embrace also the idea that the genesis of both the structure and the positioning towards notions builds up through the process of primary socialization (Berger & Luckmann, 1966; Mead, 1934) , especially

within the family, and that cultural capital (Bourdieu, 1977; 1983/1986; Prêteur & Vial 1997) influences this process.

Given those premises we formulate a first hypothesis concerning the fact that competence and intelligence are perceived by lay people as different notions (cf. Study I).

Testing this hypothesis is critical because if there is no difference in the perception of competence and intelligence it will not be parsimonious to keep those notions separated. Furthermore in checking for those differences we will have the possibility to make explicit some of the specific contents responsible for those differences and similarities.

Stated this, inspired by the three phases model (Doise, Clémence & Lorenzi-Cioldi, 1992; Palmonari & Emiliani, 2009), we will proceed to the reconstruction of a portion of the representational field for both the notions of competence and intelligence, we will rebuild the part concerning the features characterizing competent and intelligent students. We chose to focus our attention only on such a portion of the representational field because we think that in the educational environment becoming and/or appearing intelligent and/or competent are goals of utmost importance, that every student must face.

We will start our work of reconstruction (cf. Study II and III) with the ultimate aim of building and testing three tools, one that will be employed to measure the perceived relation between competence and intelligence (cf. Study IV and VI.a) and the other two that will be employed to measure people's positioning on the reconstructed representational field of competence and intelligence (cf. Study V and VI.a).

The expected effect of growing up in families characterized by different levels of cultural capital is the induction of a different implicit and explicit cognitive content. Specifically cognitive content of people raised in a low cultural capital context is supposed to be less effective in the educational context (Bourdieu & Passeron, 1977). In response to this consideration we will test the hypothesis (cf. Study VI.b and VII.b) stating that high school students with low cultural capital achieve worse in educational contexts because of stereotype threat activation (Steele & Aaronson, 1995; Croizet & Millet, 2012), particularly when facing personally relevant and cognitive demanding tasks (i.e. 8th grade final exam scores and high school Maths and Italian grades for Study VI.b; academic admission test for Study VII.b).

We will then test the hypothesis stating that people's positioning toward the principles related to competence and intelligence depend on their cultural capital level: the positioning of low cultural capital students is different from that of high cultural capital students (cf. Study VI.b and Study VII.b). We will test as well the hypothesis stating that, corresponding to different positions taken on those notions, there are variations in the above-mentioned achievements(cf. Study VI.b and Study VII.b). If those hypothesis are confirmed, positioning on the notions of competence and intelligence will have to be considered as one of the impairing causes of cultural capital on student achievements (positioning mediates the relation between cultural capital and performance).

Finally we will test these findings with a sample of college students controlling the effect of stereotype threat. In order to achieve this goal we will use a cognitive resources straining task (Colom et al., 2004; Larson & Saccuzzo, 1989). At first we will test stereotype threat activation, and the resulting performance impairment, then we will test the interaction effect across task presentation (three conditions: pastime, competence test, intelligence test) and cultural capital level. We expect that stereotype threat is

active only when the task is presented as an intelligence test, impairing low cultural capital students performance at the level of the speed (mean response time, a proxy measure for general intelligence) and task precision measure. In other words we expect that presentation will moderate stereotype threat activation (cf. Study VII). Finally we will test the hypothesis claiming that, once controlled for stereotype threat (competence test and pastime conditions), still exists a significant difference in performance unfavorable to low cultural capital students (cf. Study VII).

Let's end this introduction now pointing out, first that some international (OECD, 2009) and national (INVALSI, 2012) mass scale testing programs, grounded on specific notions of competence are becoming a reference to measure educational systems effectiveness and students achievements, and second that standardized testing used in educational environments (like in PISA and INVALSI tests) can be used as psychometric proxy measures of the general intelligence level (Felice & Giugliano, 2011; Lynn, 2010; 2012). Combining the latter facts with our dissertation hypotheses, if they won't be empirically rejected, we could claim that the use of standardized tests, in the form known today, would introduce in educational systems that chose not to adopt psychometric intelligence measures, a covert ranking and selection procedure based exactly on a psychometric notion of intelligence.

This would unfairly advantage advantaged students and disadvantage disadvantaged students, yet contradicting also the purpose of a meritocratic social system this testing procedures should foster (same opportunities for all).

CHAPTER I - Competence and intelligence: From people's thoughts to people's principles

Introduction

For this chapter we set two goal: to check if people perceive competence and intelligence as separated notions, and to rebuild the representational field for the notions of competence and intelligence.

To achieve this result we conducted three studies: the first study directly tests the hypothesis expressed by the first goal; the second study is devoted to the reconstruction of the consensual and reified universes, and the third study is aimed at building, according to the reconstructed universes, a representative set of position-taking principles.

Study I - Are competence and intelligence perceived as different notions?

The goal of this study is to show that people, in particular students, perceive the notions of competence and intelligence as different. The null hypothesis we will test can be formulated as follows: competence and intelligence are different words referring to the same notion.

To test the null hypothesis we started considering that if the same notion is linked to different words, then it should be possible to use these words interchangeably in the same linguistic context. Put in another way we could say that two words are synonym because they convey the same meaning. But if the words convey the same meaning then, when we take a set of statements that refer to this very meaning through one of this words, and replace this word with the word considered equivalent, the perceived meaning of the modified statement should not change. Accordingly we decided to test our null hypothesis applying this principle to the set of statements collected studying the social representation of intelligence (Mugny, & Carugati, 1988) replacing the word intelligence with the word competence and administering the two corresponding questionnaires to a sample of people that is, or have been, member the group of students. The statements we used are mainly focused on how intelligence develops.

Method

Sample and procedure

Using the software QUALTRICS we have built two questionnaires available on the internet. Both questionnaires contained 79 of the hundreds of items extracted from the appendix of Mugny and Carugati (1988) essay: one of them has been created using the original item formulation containing the word competence, the other contained the same items but the word intelligence have been replaced with the word competence.

We recruited the participants for our study via Facebook, advertising our research inside student communities. We collected more than 300 answers but, because of the excessive number of missing values, we rejected many of them, retaining only those with at least 80% of given answers (94 of the retained questionnaires are related to the word competence and 60 are related to the word intelligence; 38 participants are males and 116 are females; age: M = 23,86, SD= 4,27).

Measure

The only measure we collected is the positioning of participants towards each of the statements we introduced in the questionnaire, expressed through a 7 points Likert scale (1: strongly disagree; 7:strongly agree). To test the null hypothesis, stating that competence and intelligence are different words used to refer to the same notion, we performed a pool of 79 independent samples t-tests, one for each statement positioning, grouping participants according to the type of questionnaire they completed (competence, intelligence). The data have been processed wit SPSS 19.

Results

Our null hypothesis have been falsified because the number of statements that show a significant difference is greater than one (25 out of 79). In table 1 we reported all the statements that showed a significant difference.

Discussion

Having falsified the defined null hypothesis, we are allowed to say that intelligence and competence are perceived as different notions, for this reason we decided to study them separately.

When Mugny and Carugati (1988) studied the notion of intelligence they chose as their reference the social representations theory (Moscovici, 1976; 1981). This choice have been clearly stated in Carugati and Selleri (2011) as follows:

> *"In the case of intelligence, the importance of its study in terms of SR [Social Representations] could be justified by two arguments. The first is a reminder that it is a social object which almost everybody agrees in placing a positive value on it, even if intelligence lends a great number of different approaches both between scientific disciplines (psychology vs. sociology, vs. anthropology) and among each of them. It is hardly surprising, therefore, that we should find such heterogeneity in social groups and categories, i.e. in common sense views of intelligence during everyday life. But given the positive value attributed to intelligence, even not experts, everyday people all 'know' what intelligence is. The second argument concerns the impact SR of intelligence can have on the actual development of child's intelligence, through the parents'/teachers' educational procedures."* (Carugati & Selleri, 2011; p 33.3)

We are persuaded that both arguments are valid also for the notion of competence. Specifically we accept the first argument because, as well as intelligence, competence too is associated to a positive valence and refers to many different possible theories (cf. Weinert, 2001). We accept also the second argument because we made our the developmental approach stating that "*[…] cognitive development is mediated by actual or symbolic social interactions (both with peers and adults) which result in the gradual construction both of cognitive tools and of systems of social knowledge*" (Carugati & Selleri, 2011; p 33.3).

For these reasons we have decided to embrace the social representations theory in the formulation of the Lemanic school approach (Doise, 1986).

Borrowing Serge Moscovici's words (Forgas 1981; p. 181), him who introduced the concept in social psychology, social representations can be defined as "*a set of concepts, statements and explanations originating in daily life in the course of inter-individual communications. They are the equivalent, in our society, of the myths and belief systems in traditional societies; they might even be said to be the contemporary version of common sense. […] ".*

Table 1 - Independent Samples Test between statements differing only for the presence of the word competence and intelligence

	T-test for Equality of Means					Descriptives Statistics				
	t	df	Sig. (2 tail)	Mean Diff.	Std. Error Diff.	Tipo	N	Mean	Std. Dev.	Std. Error Mean
1. *Un rapporto gerarchico non può mai essere fonte di un autentico incremento di competenza/intelligenza*	2,174	149	,031	,612	,281	INTE	60	4,15	1,876	,242
						COMP	91	3,54	1,559	,163
2. *La competenza/intelligenza degli insegnanti è la migliore garanzia dello sviluppo della competenza/intelligenza dei bambini*	-4,141	151	,000	-1,177	,284	INTE	60	3,83	1,824	,236
						COMP	93	5,01	1,645	,171
3. *la competenza/intelligenza non si sviluppa: è un dono ereditario*	2,454	151	,015	,480	,195	INTE	60	2,20	1,375	,178
						COMP	93	1,72	1,036	,107
4. *Sviluppare la competenza/intelligenza significa conformarsi alle norme e ai valori della società attuale*	-2,740	151	,007	-,720	,263	INTE	60	2,00	1,402	,181
						COMP	93	2,72	1,696	,176
5. *Affinché il bambino sviluppi la competenza/intelligenza, occorre che riesca a stabilire un buon rapporto con i compagni e con l'insegnante*	-3,831	151	,000	-1,020	,266	INTE	60	3,88	1,728	,223
						COMP	93	4,90	1,526	,158
6. *La TV favorisce lo sviluppo della competenza/intelligenza del bambino*	-2,499	151	,014	-,529	,212	INTE	60	2,27	1,219	,157
						COMP	93	2,80	1,315	,136
7. *Gli errori dell'alunno sono rivelatori della sua competenza/intelligenza*	-3,284	151	,001	-,826	,252	INTE	60	2,55	1,333	,172
						COMP	93	3,38	1,628	,169
8. *I giudizi negativi sul lavoro sono indispensabili ad un bambino perché capisca che deve aumentare la sua competenza/intelligenza*	-2,029	151	,044	-,555	,274	INTE	60	3,28	1,574	,203
						COMP	93	3,84	1,702	,177
9. *Le punizioni stimolano l'aumento della competenza/intelligenza*	-2,127	150	,035	-,517	,243	INTE	60	2,20	1,299	,168
						COMP	92	2,72	1,564	,163
10. *Fratelli e sorelle costituiscono altrettanti fattori essenziali allo sviluppo della competenza/intelligenza*	-2,232	151	,027	-,629	,282	INTE	60	4,17	1,976	,255
						COMP	93	4,80	1,500	,156
11. *Lo stimolo più efficace per lo sviluppo della competenza/intelligenza sono i voti*	-3,079	150	,002	-,724	,235	INTE	60	1,95	1,213	,157
						COMP	92	2,67	1,534	,160
12. *Perché sviluppi la competenza/intelligenza, bisogna che il bambino sviluppi prima il linguaggio*	-3,625	150	,000	-1,059	,292	INTE	60	2,80	1,665	,215
						COMP	92	3,86	1,819	,190
13. *Il bambino si limita ad sviluppare la competenza/intelligenza che il suo ambiente gli insegna*	-2,059	151	,041	-,584	,284	INTE	60	3,23	1,789	,231
						COMP	93	3,82	1,661	,172
14. *Si può sempre sviluppare notevolmente il proprio livello di competenza/intelligenza.*	-2,493	150	,014	-,653	,262	INTE	60	4,97	1,657	,214
						COMP	92	5,62	1,525	,159
15. *Fin dalla nascita il bambino possiede una competenza/intelligenza intellettiva che sviluppa in funzione dell'educazione che riceve*	-2,789	151	,006	-,715	,256	INTE	60	4,17	1,404	,181
						COMP	93	4,88	1,634	,169
16. *Non importa quant'è la competenza/intelligenza che si possiede, la si può sempre sviluppare notevolmente.*	-2,499	151	,014	-,619	,248	INTE	60	4,80	1,603	,207
						COMP	93	5,42	1,424	,148
17. *Quando un bambino si sbaglia nell'applicare una nuova regola ad un problema per il quale essa non è adatta, l'errore è una prova che il bambino sta sviluppando la competenza/intelligenza*	-2,509	136	,013	-,679	,271	INTE	60	3,33	1,503	,194
						COMP	78	4,01	1,632	,185
18. *I giudizi sul lavoro del bambino sono più utili che i voti per fare sviluppare la competenza/intelligenza*	-2,479	136	,014	-,691	,279	INTE	60	4,45	1,817	,235
						COMP	78	5,14	1,457	,165
19. *Nella famiglia è il padre che svolge il ruolo più importante nello sviluppo della competenza/intelligenza dei figli*	-2,213	130	,029	-,447	,202	INTE	60	1,57	,963	,124
						COMP	72	2,01	1,295	,153
20. *Lo sviluppo della competenza/intelligenza è costituito dall'apprendimento progressivo delle regole della vita sociale*	-2,385	129	,019	-,598	,251	INTE	59	3,76	1,546	,201
						COMP	72	4,36	1,325	,156
21. *I genitori costituiscono il principale modello di cui il bambino dispone per sviluppare la competenza/intelligenza*	-2,102	130	,038	-,575	,274	INTE	60	4,30	1,587	,205
						COMP	72	4,88	1,547	,182
22. *Affinché un bambino sviluppi la competenza/intelligenza, è sufficiente mostrargli la soluzione corretta*	-2,120	130	,036	-,497	,235	INTE	60	1,85	1,424	,184
						COMP	72	2,35	1,269	,150
23. *Il bambino che non ama la scuola non sviluppa la competenza/intelligenza*	-4,179	129	,000	-,966	,231	INTE	60	1,58	1,154	,149
						COMP	71	2,55	1,442	,171
24. *Il bambino, nello sviluppo di competenza/intelligenza, trae vantaggio da un lavoro di gruppo solo se è associato a bambini più avanti di lui*	-2,110	130	,037	-,575	,272	INTE	60	2,47	1,455	,188
						COMP	72	3,04	1,640	,193
25. *La ripetizione frequente degli esercizi è indispensabile allo sviluppo della competenza/intelligenza*	-2,048	130	,043	-,622	,304	INTE	60	3,60	1,897	,245
						COMP	72	4,22	1,594	,188

According to this statement and taking into account Bourdieu's field theory, Willelm Doise interpreted Moscovici's definition describing social representations as "*principles of position-taking linked to specific insertions in social fields and as symbolic organizers of social relations*" (Doise, 1986) where principles of position-taking are conceived as structured structures "*structured structures predisposed to function as structuring structures, that is to say, as a principle of generation and structuring of practices and representations*" (Bourdieu 2003; p. 206-207), insertions as historically defined social positions, and fields as, in Bourdieu terms, a set of social objects that have among them relations of hierarchy and opposition which, in turn, express the hierarchy of values in the field, both economically and culturally (Doise 2005) and in Lewin terms, recognizes the importance of the hierarchy of values, motivations and needs, of individuals and groups attitudes, organizing the representation of the living environment people build and of the influence that this representation carries orienting their behaviors (Palmonari & Emiliani, 2009).

In order to study social representations, consistently with this new approach, Doise and colleagues (Doise, Clémence & Lorenzi-Cioldi, 1992) defined a method named "the three phases model". The steps through which the model suggests to move can be summarized as follows (Palmonari & Emiliani, 2009; p. 182):

> *"1) analysis of common knowledge, namely beliefs and knowledge shared by members of a group more or less large towards a relevant social object . We talk of the representational field analysis and of the objectified contents: the first stage aims at the study of objectification.*
> *2) study of the organizing principles of the positions taken by individuals or subgroups compared to the representational texture.*
> *3) analysis of the links between the taken positions and specific insertions within systems of symbolic relations. The third phase aims at the study of the anchoring."*

In order to rebuild the representational filed of competence and intelligence in this chapter we inspired our method to the first phase of the three phases model. In accordance to the first step we implemented two studies: the first, study II, focuses on reconstructing and studying the semantic content of the consensual universe (unsystematic commonsense knowledge) and the reified universes (systematic academic knowledge) for the notions of competence and intelligence, and the last, study III , will focus on the identification and the consolidation of the themes emerging from content analysis followed by a first selection of a representative subset of statements constituting the objectification of the representational field. Before presenting the studies devoted to the reconstruction of the representational filed of the notions of competence an intelligence we want to briefly explain the reason why we didn't use the work done by Mugny and Carugati (1988) on the representations of intelligence. The fact is that the content of social representations is historically grounded and having been a long time since the content of the authors has been rebuilt it could have been subject to changing processes, also attributable to the introduction of the concept of competence. Moreover, reconstructing at the same time both the representations of intelligence and competence will enable us to better understand content differences, overlaps (same content for both notions) and swaps (contents used sometimes for a notion and some time for the other).

Reconstructing the representational field of competence and intelligence

Duveen, and Lloyd claim that Moscovici's conceptualisation of the process of social representation is related to his distinction between the consensual universe of social representations and the reified universe of scientific discourse which respects the laws of logic and whose products are open to empirical investigation and underline also that the study of social representations casts light on the way in which the reified universe of science is represented in the consensual world of everyday understanding (Duveen, Lloyd, 1990).

It follows that social representations inhabit the consensual universe, but arise from the interaction between the consensual and the reified universe through spoken and printed communication. To stress this dynamic we kept in studies II and III this distinction with the aim to grasp some information on this process.

Study II.a - Reconstructing the consensual universe of competence and intelligence

The goal of this study is the reconstruction of the consensual universe for both the notions of competence and intelligence.

Method

Sample

We administered an open-ended questionnaire (cf. Fig. 1) to 308 students of the degree course in behavioral sciences and social relations at the University of Bologna, of which 101 responded on the concept of competence, 97 on the notion of intelligence and 110 on both topics. All participants responses were collected before an academic lecture beginning. Students that answered the questionnaire have been asked to contribute to a scientific research giving their opinion not as psychologists or as scholars but as lay people.

Figure 1 – The questions used to collect statements concerning the notions of competence and intelligence.

Descriva brevemente, per favore, uno STUDENTE che Lei definirebbe **competente**:
[*Please, briefly describe a student that you would define COMPETENT:*]
_____
_____
_____
_____

Descriva brevemente, per favore, uno STUDENTE che Lei definirebbe **intelligente**:
[*Please, briefly describe a student that you would define INTELLIGENT:*]
_____
_____
_____
_____

Procedure

In this study we considered the notions of competence and intelligence as attributes and not as nouns/objects. To collect the sample of statements to be used in rebuilding the content of the consensual universe of competence and intelligence we collected data as follows:

1) asking half of participants questions on both notions;
2) splitting the remainder of participants in two further halves, and asking the first half to answer only to the competence question and to the other half to answer only to the intelligence question.

Once collected the answers we transcribed them in electronic format and prepared the data for the elaboration with the T-Lab software, version 7.0.3 (Lancia, 2004; 2012).

In order to perform its natural language analysis this tool uses algorithms based on occurrences and co-occurences of words in documents and sentences, consequently the quality of the analysis depends heavily on the corpus size, as measured in number of words (the higher the number of words the better), on morphological word variability (the less the variability the better) and on the number of topics that it contains (the less the topics the better). For this reason, before using T-lab on collected data we applied two steps of manual normalization (Table 2). The first normalization step have been performed to make uniform sentences with respect to tense and form. In the second normalization step we separated all answers in simple sentences focused only on a specific topic. Finally we categorized each sentence according to its type (COMP standing for competent, and INTE standing for intelligent). Once terminated the manual normalization process we imported all the statements as a single corpus into T-Lab. When importing , T-Lab software submitted the corpus to a semiautomatic four steps normalization procedure (Lancia, 2011; p. 172) including lemmatization, stop-words removal, text segmentation, multi-word identification, and keywords extraction (we chose the chi square metric).

Table 2 –An example of the manual normalization process

ORIGINAL TEXT	***TEXT AFTER NORMALIZATION STEP 1***	***TEXT AFTER NORMALIZATION STEP 2***
COMP *in grado di superare bene gli esami, che ricorda ciò che ha studiato anche a distanza di tempo e sa applicare i contenuti appresi anche in contesti svincolati da quello scolastico* *INTE* *si comporta in modo consono alla situazione (lezione, esame, colloquio con un docente) sa usare le strategie più efficaci ai fini dell'apprendimento, supera gli esami, ricorda e applica in ambiti diversi ciò che ha imparato anche a distanza di tempo*	*COMP* *superare bene gli esami, ricordare ciò che si è studiato anche a distanza di tempo, saper applicare i contenuti appresi anche a contesti svincolati da quello scolastico.* *INTE* *comportarsi in modo consono alla situazione (lezione, esame, colloquio con un docente) saper usare le strategie più efficaci ai fini dell'apprendimento, superare gli esami, ricordare, applicare in ambiti diversi ciò che si è imparato anche a distanza di tempo.*	*COMP* • *superare bene gli esami.* • *ricordare ciò che si è studiato anche a distanza di tempo.* • *applicare i contenuti appresi anche a contesti svincolati da quello scolastico.* *INTE* • *comportarsi in modo consono alla situazione (lezione, esame, colloquio con un docente).* • *usare le strategie più efficaci ai fini dell'apprendimento.* • *superare gli esami.* • *ricordare.* • *applicare in ambiti diversi ciò che si è imparato anche a distanza di tempo.*

Table 3 – Corpus descriptive statistics

COUNTER NAME	WHOLE CORPUS	COMPETENCE SUBCORPUS	INTELLIGENCE SUBCORPUS
Variables	1		
Entries	1174	572	602
Lemmas	899	476	529
Lemmatized words	1216	593	653
Word forms in the dictionary	1446	717	806
Tokens	7340	1998	2175
Words with 1 occurrence (hapax)	752	419	478
Stopwords	254	254	254
Multiwords	86	29	28
T-LAB key terms	229 (f >3)		
Key terms	475 (f >1)		
Lemmas excluded from analysis	9 (buon*; possed*; propr*)		

The corpus imported in T-lab is composed of 1174 simple sentences (572 referring to competent students and 602 referring to intelligent students) and 899 lemmas (476 appearing in sentences referring to competent students and 529 appearing in sentences referring to intelligent students; see Table 3 for more details).

Measures

In order to study the meanings conveyed by the lexicons of competence and intelligence sub-corpora (Lancia, 2011; p. 112) we performed a specificity analysis. The procedure compares corpora dictionaries, represented by a list of lemmas associated with frequencies, highlighting typical words (words shared by both dictionaries but differing for their occurrence frequency) and exclusive words (words that are present exclusively in one and only one dictionary).

Next, to build and explore a graphical representation of the imported corpus content we performed a thematic analysis. The analysis outputs a small number of thematic clusters (groups of sentences focused on a specific theme) characterized by a shared pattern of keywords. Each thematic cluster is hence characterized by lemmas and variables (if any). Identified clusters are then projected on a two dimension factorial plan in order to disclose proximity or opposition relations (Lancia, 2011; p. 61; Braun & Clarke, 2006).

Results

Specificity analysis Results

Results of exclusive words analysis (Table 4) highlights on the side of the intelligence sub-corpus two specific topics, one is focused on readiness (facilmente, brillante, velocemente) and the other is focused on the use of logic (logica, collegamenti logici). On the side of the competence sub-corpus we can isolate two different topics, one related to carefulness (padroneggiare, appropriato, costanza) and the other focused on action orientation (adempiere, andare avanti, attivamente).

Table 4 – Intelligence and competence exclusive words.

INTELLIGENCE SUB-CORPUS	
Exclusive words	**Frequency**
Facilità	14
Facilmente	10
Brillante	9
Creare	7
Mentale	7
Domanda	6
Velocemente	6
Critiche	5
Logica	5
Collegamenti logici	4
Giungere	4
Logiche	4
Migliorare	4
Porre	4
QI	4
Quotidiano	4
Sociale	4
Spiegato	4
Successo	4

COMPETENCE SUB-CORPUS	
Exclusive words	**Frequency**
Padroneggiare	13
Preparare	8
Appropriato	7
Frequentare	6
Costanza	5
Formativo	5
Richiesta	5
Adempiere	4
Aggiornato	4
Andare avanti	4
Assegnato	4
Attivamente	4
Motivare	4
Regolarmente	4

Afterwards we performed the typical word analysis. We ranked emerging words according to the following formula (b) where the distance in terms of occurrences (occ(x)) is normalized on the highest of the compared word frequencies:

(a) $\mathbf{DIST(W^A, W^B)} = (occ(\mathbf{W^A}) - occ(\mathbf{W^B}))$

(b) $\mathbf{DELTA(W^A, W^B)} = \mathbf{DIST(W^A, W^B)} / MAX(occ(\mathbf{W^A}); occ(\mathbf{W^B}))$

We adopted this strategy because we wanted to differentiate apparently equivalent distances (calculated simply as the difference between the occurrences of the compared words; cfr (a)) when referring to different word frequencies. We make the hypothesis that the same distance is less interesting if the frequency of compared words is high. For instance, if we have a word X that occurs 10 time in corpus A and 5 times in corpus B, DIST for X would be 5 and DELTA for X would be .50 (5/10), but if we have a word Y that occurs 20 times in corpus A and 15 times in corpus B, DIST would be always 5 but DELTA for Y would be .25 (5/20), hence the word X would be considered most relevant for the corpus A when compared with word Y.

Table 5 – Intelligence and competence typical words.

INTELLIGENCE SUB-CORPUS			
SHARED WORDS	**COMP**	**INTE**	**DELTA**
Ragionamento	1	18	,944
Intelligenza	1	11	,909
Poco sforzo	1	11	,909
Cogliere	1	10	,900
Ascoltare	1	9	,888
Logico	1	8	,875
Dotare	3	19	,842
Aprire	1	6	,833
Comportare	1	6	,833
Cultura	1	6	,833
Elevato	1	6	,833
Intuitivo	1	6	,833
Scuola	1	6	,833
Capire	4	22	,818
Concetto	4	22	,818
Collegamento	5	26	,807
Memorizzare	1	5	,800
Comprendere	4	20	,800

COMPETENCE SUB-CORPUS			
SHARED WORDS	**COMP**	**INTE**	**DELTA**
Strumento	21	2	-,904
Materiale	10	1	-,900
Partecipare	8	1	-,875
Percorso	8	1	-,875
Svolgere	28	4	-,857
Specifico	13	2	-,846
Seguire	12	2	-,833
Campo	6	1	-,833
Responsabile	5	1	-,800
Compito	14	3	-,785
Conoscere	18	4	-,777
Diligente	9	2	-,777
Efficace	9	2	-,777
Studi	17	4	-,764
Mettere in pratica	8	2	-,750
Corso di studi	4	1	-,750
Didattico	4	1	-,750
Dovere	4	1	-,750

The typical words analysis, applying the ranking formula just presented, replicates the results obtained in the exclusive words analysis (Table 5): we identify two main topics for the intelligence sub-corpus, one focused on readiness (cogliere, poco sforzo, intuitivo) and the other focused on use of logic (ragionamento, logico, comprendere), and two main topics for competence sub-corpus, one related to carefulness (responsabile, diligente, dovere) and the other related to action orientation (mettere in pratica, compito, svolgere).

Thematic Analysis Results

The thematic analysis performed by T-Lab implements a procedure consisting of two consecutive steps: clustering and then correspondence analysis. The output of the former step is a small set of so called thematic clusters, groups of sentences sharing characteristic content words. The output of the latter step consists in a two dimensions map representing the semantic relationships characterizing the corpus through the emerging thematic clusters. The map is built upon data generated by correspondence analysis performed on the thematic clusters and characteristic words identified in the former phase.

The goal of this analysis is to explore the whole corpus and each of the sub-corpora in order to discover their latent semantic structure, that structure that we will use to guide our search for principles of position-taking. The strategy that we have followed involves running three separate analyses: one focused on the competence sub-corpus, one focused on the intelligence sub-corpus, and the last one focused on the whole corpus. The first two analyses are intended to enable us to isolate the semantic structure of each of the two notions. The third analysis aims to understand how and how much the semantic nuclei of the two concepts interact. We start from the assumption (tested at the beginning of this chapter) that competence and intelligence are not the same notion.

Competence sub-corpus

The first thematic analysis has been performed on the competence sub corpus (cf. Table 3 for descriptive statistics). We set the procedure parameters in order to get no more than 10 thematic clusters and to consider in the analysis all lemmas occurring at least 2 times in the corpus.

T-lab identified and labeled five clusters (Table 6). In order to distinguish cluster labels we placed before the label the prefix "C", as "Competence" followed by a number .

Table 6 - Thematic clusters emerging from the elaboration
435 out of 572 (76%) competence related statements

Description	***Contexts in each cluster***	***%***
C1_LEZIONE	*47*	*10.8%*
C2_STUDIO	*92*	*21.15%*
C3_COMPITO	*60*	*13.79%*
C4_STRUMENTO	*135*	*31.03%*
C5_CONOSCENZA	*101*	*23.22%*
TOTAL	*435*	*100%*

Table 7 – Samples of characteristic words members of the identified thematic clusters.

C1_LEZIONE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Lezione*	191.936	22	22
Seguire*	95.258	11	11
Metodo	60.456	7	7
Partecipare	60.456	7	7
Frequentare	51.784	6	6

C2_STUDIO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Studio*	69.625	30	41
Lavoro	59.576	17	18
Organizzare*	48.060	14	15
Capacità	25.182	11	15
Formativo	18.977	5	5

EC IN CLUSTER: elementary contexts in the cluster containing the specific lemma

EC IN TOTAL : elementary contexts in the whole corpus containing the specific lemma

CHI SQUARE : significance of a word occurrences within an elementary context

* : identify words chosen by T-Lab to describe the content of each cluster

C3_COMPITO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Padroneggiare*	52.127	10	12
Prendere	33.106	5	5
Compito	32.324	9	14
Contenuti	28.462	7	10
Risultato*	26.915	6	8

C4_STRUMENTO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Utilizzare*	33.98	20	22
Apprendere	19.044	21	30
Strumento*	18.045	16	21
Usare*	17.825	12	14
Conoscenze*	15.194	26	43

05_CONOSCENZA			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Studiare*	113.962	38	42
Conoscere*	35.601	13	15
Conoscenza*	27.579	8	8
Studi*	22.673	12	17
Preparare	17.202	5	5

Table 8 - Selection of elementary contexts sorted by chi-square descending order (characteristic words are to the right of the cluster label).

C1_LEZIONE	*seguire, lezioni*
Score	**EC**
79,61	seguire le lezioni con costanza
78,24	partecipare attivamente alle lezioni
52,22	seguire le lezioni con interesse
52,22	seguire le lezioni in maniera attiva
52,22	seguire le lezioni in_presenza o per altri canali

C2_STUDIO	*organizzare, studio*
Score	**EC**
25,45	organizzare la mole di studio in modo diluito nel corso del tempo
21,37	dimostrarsi capace di affrontare e risolvere i problemi che si presentano nello studio
20,62	adempiere ai propri doveri (studio, lavoro)
18,36	organizzare i tempi di studio in_relazione ad altri impegni;
17,83	in_grado_di organizzare lo studio senza particolari difficoltà

C3_COMPITO	*padroneggiare contenuti, ottenere risultati*
Score	**EC**
12,72	indipendente dai risultati ottenuti agli esami
9,84	superare tutti gli esami con risultati buoni;
9,48	padroneggiare dei contenuti
7,13	padroneggiare la propria materia
6,97	portare_a_termine un compito con buoni o addirittura ottimi risultati

C4_STRUMENTO	*usare strumenti, usare conoscenze*
Score	**EC**
33,8	utilizzare gli strumenti e le abilità acquisite nel contesto in cui vengono richieste e in altri contesti che non richiedono esplicitamente abilità acquisite,
24,36	utilizzare gli strumenti cognitivi in maniera appropriata in diverse situazioni
18,15	utilizzare le proprie conoscenze acquisite nel modo corretto e in diverse situazioni
15,33	utilizzare le conoscenze in maniera appropriata nei diversi compiti
9,03	usare in modo appropriato le conoscenze acquisite

C5_CONOSCENZA	*possedere conoscenza, studiare per acquisire conoscenza*
Score	**EC**
16,65	studiare e apprendere in modo efficace per la propria conoscenza
16,65	essere dotato di una buona conoscenza delle materie che si studiano
15,43	essere culturalmente preparati in quello che si studia e che si fa
15,33	acquisire conoscenze specifiche in merito a ciò che si studia
15,26	padroneggiare gli argomenti studiati

score: relevance assigned to the elementary context (Lancia, 2011; p. 79).

EC: elementary context.

Table 9 - Thematic clusters emerging from the elaboration of 479 out of 602 (80%) intelligence related statement.

Description	***Number of contexts***	***% of contexts***
I1_LEZIONE	*71*	*14.82%*
I2_INFORMAZIONE	*102*	*21.29%*
I3_CAPACITÀ	*163*	*34.03%*
I4_CONCETTO	*143*	*29.85%*
TOTAL	*479*	*100%*

The competence sub-corpus thematic analysis output draws attention on specific abilities characterizing the student role: (C1) attending classes, (C2) organizing own study, (C3) achieving results (C4) using knowledge and tools, and (C5) acquiring knowledge.

Intelligence sub-corpus

The second thematic analysis has been performed on the intelligence sub corpus (cf. Table 3 for descriptive statistics). The parameters setting is the same we used for competence sub-corpus analysis.

Table 10 - Samples of characteristic words members of the identified thematic clusters.

I1_LEZIONE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Capire*	112.037	19	19
Imparare*	64.542	11	11
Lezione	46.853	8	8
Ascoltare	40.971	7	7
Velocemente*	35.096	6	6

I3_CAPACITÀ			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Capacità*	80.347	54	65
Dotare	34.464	18	19
Possedere*	33.778	36	52
Risultato*	27.613	13	13
Ottenere*	26.814	16	18

I2_INFORMAZIONE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Contesto	25.519	11	13
Informazione	25.519	11	13
Soluzione*	24.703	8	8
Risolvere*	23.264	9	10
Studio	22.432	18	29
Trovare	19.653	12	17
Problemi*	16.698	8	10

I4_CONCETTO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Apprendere*	69.292	29	30
Studiare	46.328	23	26
Concetto*	39.856	19	21
Collegamento*	38.874	20	23
Materia*	35.228	14	14

EC IN CLUSTER: elementary contexts in the cluster containing the specific lemma

EC IN TOTAL : elementary contexts in the whole corpus containing the specific lemma

CHI SQUARE : significance of a word occurrences within an elementary context

* : identify words chosen by T-Lab to describe the content of each cluster

Table 11- Selection of elementary contexts sorted by chi-square descending order with characteristic words.

I1_LEZIONE	*capire/imparare/ricordare facilmente/velocemente*
Score	**EC**
26,77	capire relativamente facilmente ciò che si ascolta o legge
25,08	capire velocemente anche collegamenti o concetti difficili
16,73	capire subito i contenuti delle lezioni;
15,49	capire la situazione velocemente
15,49	possedere capacità di ricordare con facilità le cose che si capiscono

I2_INFORMAZIONE	*risolvere problemi, trovare strategie*
Score	**EC**
27,79	trovare con la logica e l'intuito la soluzione a problemi nuovi che ci si trova a dover affrontare
27	trovare soluzioni buone e nuove a nuove difficoltà (che stiano per affrontare un nuovo corso o un corso che non piace) nel percorso universitario
17,18	trovare nuove strategie per risolvere i problemi
16,27	trovare nuove strategie per risolvere compiti quotidiani
9,63	collegare le nozioni_apprese al_fine_di risolvere problemi sia in ambito lavorativo o scolastico, sia nel quotidiano

Score: relevance assigned to the elementary context (Lancia, 2011; p. 79).

EC: elementary context.

I3_CAPACITÀ	*possedere/sfruttare capacità di ragionamento logico, studio, apprendimento, pensiero critico, comprensione, memoria, sintesi in modo ottimale*
Score	**EC**
19,56	avere ottime capacità di ragionamento logico e di deduzione
19,56	possedere ottime capacità di ragionamento, non necessariamente logico
18,26	sfruttare ogni propria capacità per raggiungere il miglior risultato in situazione di difficoltà
17,39	essere dotato di capacità di studio elevate
17,01	essere dotato di capacità di ragionamento
16,58	essere dotato di buone capacità di apprendimento
16,37	essere dotato di capacità critiche

I4_CONCETTO	*acquisire concetti rapidamente, fare collegamenti tra argomenti/materie*
Score	**EC**
48,74	apprendere in maniera semplice con poche difficoltà concetti o materie da studiare, a_prescindere dalla propria cultura
27,58	avere bisogno di poco tempo per studiare per comprende un concetto
21,26	fare collegamenti fra gli argomenti che già si sono appresi
20,02	apprendere concetti in poco tempo e senza troppe difficoltà
17,09	trovare in ogni materia di studio collegamenti ad altri concetti

T-lab identified and labeled four clusters (Table 9). In order to distinguish cluster labels we placed before the label the prefix "I", as "Intelligence" followed by a number .

The results of the thematic analysis of intelligence sub-corpus (cf. Tables 10 and 11) draws attention on general cognitive abilities applied to student activities: (I1) readiness, (I2) problem solving ability, (I3) effective use of cognitive abilities, (I4) acquiring and linking concepts abilities.

Whole corpus

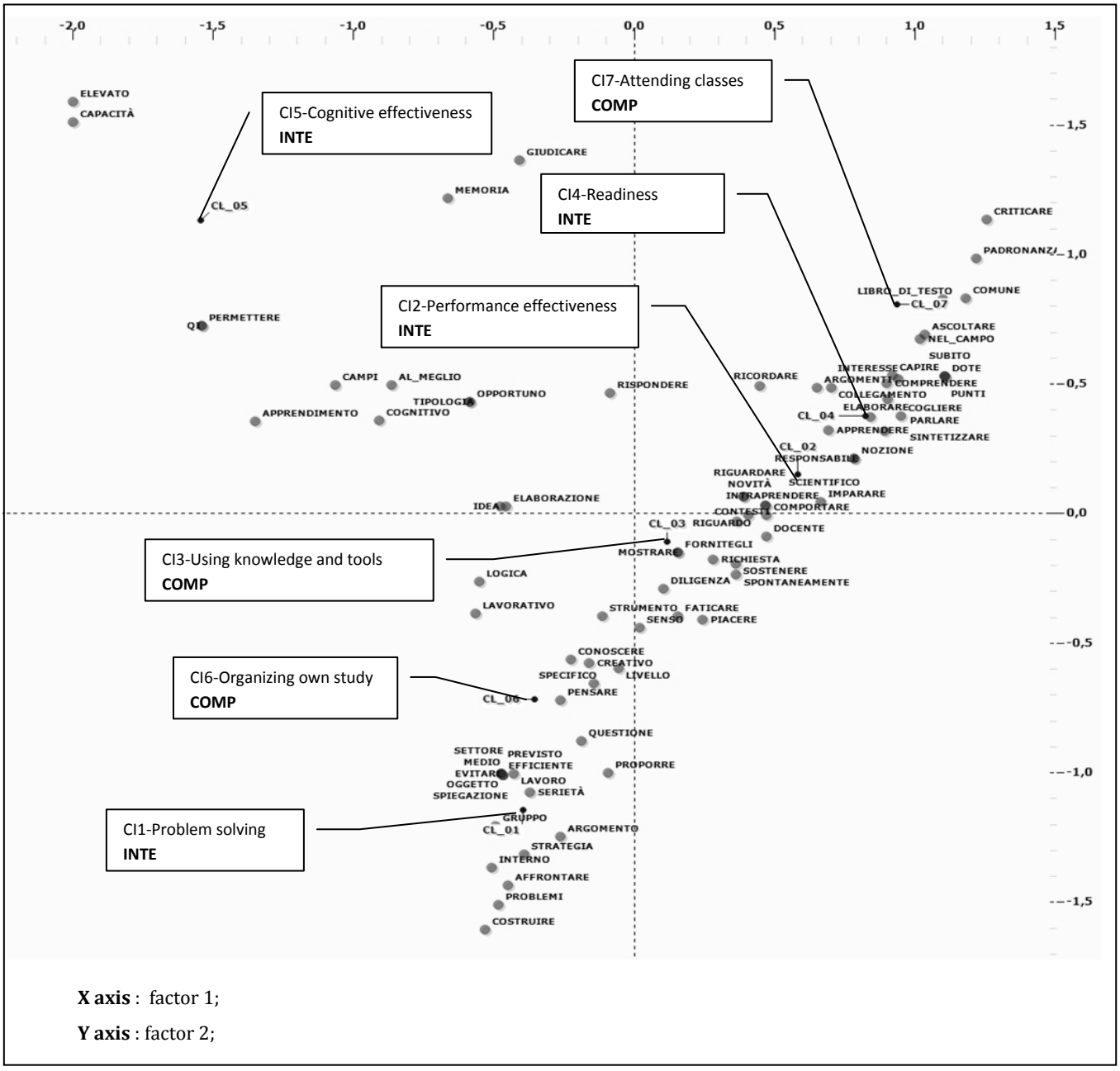
The third thematic analysis has been performed on the whole corpus (cf. Table 3 for descriptive statistics). The parameters setting is the same we used for competence and intelligence sub-corpus analysis.

T-lab identified and labeled seven clusters (Table 9). In order to distinguish cluster labels we placed before the label the prefix "CI", as "Competence/Intelligence" followed by a number.

Table 12 - Thematic clusters emerging from the elaboration of 914 out of 1174 (78%) statements.

Description	*Type*	*Number of contexts*	*%*
CI1_PROBLEMI	*Inte*	*110*	*12.04%*
CI2_NOZIONE	*Inte*	*166*	*18.16%*
CI3_CONOSCENZE	*Comp*	*172*	*18.16%*
*CI4_CONCETTO**	*Inte*	*90*	*9.85%*
*CI5_CAPACITÀ**	*Inte*	*122*	*13.35%*
*CI6_STUDIO**	*Comp*	*136*	*14.88%*
CI7_LEZIONE	*Comp*	*118*	*12.91%*

Figure 2 - Projection on the computed correspondence analysis factor space of thematic clusters centroids.



X axis : factor 1;

Y axis : factor 2;

Table 15 - Correspondence analysis parameters.

Factors	Eigenvalues	Variance explained	Cumul. Variance explained
1	4,519	37.43%	37.43%
2	*3,910*	*32.45%*	*69.88%*

Table 13 - Samples of characteristic words members of the identified thematic clusters.

CI1_PROBLEMI			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Trovare*	112.856	21	23
Problemi*	77.328	14	15
Affrontare*	76.757	15	17
Risolvere*	71.284	13	14
Soluzione*	60.509	10	10

CI2_ NOZIONE			
LEMMA	CHI SQUARE	EC IN CLUSTER	EC IN TOTAL
Nozione	100.488	22	22
Ottenere*	98.821	23	24
Imparare	79.426	20	22
Sapere	71.354	17	18
Risultato*	65.367	18	21
Obiettivo	63.782	14	14
Raggiungere*	62.238	15	16
Poco sforzo*	54.636	12	12

CI3_ CONOSCENZE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Conoscenze*	162.462	56	65
Diverso	45.821	24	35
Svolgere	44.78	22	31
Utilizzare*	36.758	21	32
Acquisito	30.182	12	15
Mettere	27.569	9	10
Usare	25.343	17	28
Determinato	24.071	12	17
Ambito	23.102	20	37
Adeguato	20.977	11	16
Strumento*	20.949	14	23

CI4_ CONCETTO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Concetto*	158.351	20	25
Apprendere	150.273	32	60
Capire*	146.419	18	22
Cogliere	81.996	9	10
Facilmente*	46.563	7	10
Situazione	44.793	15	38
Spiegato	41.299	4	4
Legge	41.299	4	4
Adattare	31.467	4	5
INTE	23.401	70	479

CI5_CAPACITÀ			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Capacità*	539.567	78	80
Dotare	154.302	22	22
Possedere*	123.761	47	94
Sfruttare*	116.914	19	21
Buone	49.261	10	13
Ragionamento	42.339	11	17
Elevato	41.866	6	6
Comprensione	41.029	7	8
Mentale	34.199	6	7
INTE	28.877	96	479

CI6_ STUDIO			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Studio*	201.809	51	70
Lavoro	112.451	22	25
Organizzare*	66.553	16	21
Impegnare*	60.509	10	10
Proprio	58.352	29	60
Efficace	30.974	8	11
Metodo di studio	30.206	5	5
Conoscere	29.889	11	19
Metodo	29.887	7	9
Motivare	24.157	4	4
COMP	24.04.00	95	435

CI7_ LEZIONE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Lezione*	188.869	26	30
Studiare	125.665	35	68
Partecipare*	51.108	7	8
Seguire	48.429	9	13
Creare	42.658	6	7
Collegamento	41.59.00	13	27
Attivamente	34.469	4	4
Pensiero	34.469	4	4
Frequentare	34.278	5	6
Argomenti	30.489	11	25
Comprendere	25.823	9	20
Informazione	23.867	9	21
Regolarmente	17.916	3	4
Padronanza	17.916	3	4
Aprire	17.916	3	4
Informare	17.916	3	4
COMP	14.779	68	435

EC IN CLUSTER: elementary contexts in the cluster containing the specific lemma

EC IN TOTAL : elementary contexts in the whole corpus containing the specific lemma

CHI SQUARE : significance of a word occurrences within an elementary context

* : identify words chosen by T-Lab to describe the content of each cluster

Table 14 - Selection of elementary contexts sorted by chi-square descending order grouped by clusters.

Clusters containing mainly statements members of the INTELLIGENCE sub-corpus

CI1_**PROBLEMI**		*Problem solving*
Type	**Score**	**EC**
INTE	101,76	trovare con la logica e l'intuito la soluzione a problemi nuovi che ci si trova a dover affrontare
INTE	92,67	trovare soluzioni buone e nuove a nuove difficoltà (che stiano per affrontare un nuovo corso o un corso che non piace) nel percorso universitario
INTE	59,22	trovare nuove strategie per risolvere i problemi
INTE	49,72	trovare nuove strategie per risolvere compiti quotidiani
COMP	46,03	dimostrarsi capace di affrontare e risolvere i problemi che si presentano nello studio

CI2_**NOZIONE**		*Performance effectiveness*
Type	**Score**	**EC**
INTE	37,11	svolgere un dato compito con il minimo sforzo ottenendo buoni risultati
INTE	37,11	agire in_modo_da ottenere i massimi risultati con il minimo sforzo possibile
INTE	31,66	raggiungere buoni obiettivi che ci si prefigge con il minimo sforzo
COMP	26,01	raggiungere un minimo risultato accettabile da una scuola che si frequenta o del lavoro che si esegue
COMP	25,78	ottenere ottimi o buoni_risultati all'esame

CI4_**CONCETTO**		*Readiness*
Type	**Score**	**EC**
INTE	76,26	apprendere in maniera semplice con poche difficoltà concetti o materie da studiare, a_prescindere dalla propria cultura
INTE	72,34	capire velocemente anche collegamenti o concetti difficili
INTE	54,3	capire relativamente facilmente ciò che si ascolta o legge
INTE	53,81	apprendere concetti in poco tempo e senza troppe difficoltà
INTE	53,51	capire concetti difficili

CI5_**CAPACITÀ**		*Cognitive effectiveness*
Type	**Score**	**EC**
INTE	87,22	possedere ottime capacità di ragionamento, non necessariamente logico
INTE	87,22	avere ottime capacità di ragionamento logico e di deduzione
COMP	82,25	aver sviluppato un'ottima capacità critica nei_confronti di quello che ha studiato, anche di quello che ancora non sa ma a cui si potrebbe trovare di fronte un_domani
INTE	78,88	essere dotato di capacità di ragionamento
INTE	78,83	essere dotato di capacità di studio elevate

Clusters containing mainly statements members of the COMPETENCE sub-corpus

CI3_CONOSCENZE		*Using knowledge and tools*
Type	**Score**	**EC**
COMP	50,86	utilizzare le conoscenze in maniera appropriata nei diversi compiti
INTE	41,6	usare le conoscenze acquisite in diversi contesti, ove necessario
COMP	34,33	utilizzare gli strumenti e le abilità acquisite nel contesto in cui vengono richieste e in altri contesti che non richiedono esplicitamente abilità acquisite,
COMP	34,2	esprimere le proprie conoscenze in un determinato ambito in attività utili per la persona
COMP	33,36	utilizzare le proprie conoscenze acquisite nel_modo corretto e in diverse situazioni

CI6_**STUDIO**		*Organizing own study*
Type	**Score**	**EC**
COMP	44,23	essere abile nel compiere il proprio lavoro (studio) in modo efficiente ed efficace
COMP	29,86	applicare le conoscenze ai vari ambiti di studio, alla vita_quotidiana e al lavoro
COMP	29,86	adempiere ai propri doveri (studio, lavoro
COMP	28,06	organizzare in modo creativo ed efficace il proprio studio
COMP	26,94	organizzare la mole di studio in modo diluito nel corso del tempo

CI7_**LEZIONE**		*Attending classes*
Type	**Score**	**EC**
COMP	34,55	studiare in modo approfondito i manuali e gli appunti delle lezioni;
COMP	29,4	partecipare attivamente alle lezioni
COMP	25,83	frequentare regolarmente le lezioni
INTE	17,74	creare collegamenti tra vari argomenti trattati in diverse discipline
COMP	17,46	padroneggiare gli argomenti studiati

Score: relevance assigned to the elementary context (Lancia, 2011; p. 79).

EC: Elementary context.

Type: Original elementary context sub-corpus membership

Table 16 –Summary of the whole corpus semantic structure

Label	Main EC Type	Key concept	*Tot. EC*	COMP. EC*	COMP. EC %	*INTE. EC* *	*INTE.* EC %
CI6_STUDIO	**COMP**	*Organizing own study*	*136*	17	80,95%	4	19,05%
CI7_LEZIONE	**COMP**	*Attending classes*	*118*	16	80,00%	4	20,00%
CI3_CONOSCENZE	**COMP**	*Using knowledge and tools*	*172*	13	65,00%	7	35,00%
CI2_NOZIONE	**INTE**	*Performance effectiveness*	*166*	8	38,10%	13	61,90%
CI1_PROBLEMI	**INTE**	*Problem solving*	*110*	7	35,00%	13	65,00%
CI5_CAPACITÀ	**INTE**	*Cognitive effectiveness*	*122*	3	15,00%	17	85,00%
CI4_CONCETTO	**INTE**	*Readiness*	*90*	1	5,00%	19	95,00%

* *number of elementary contexts having chi square > 3.84, df = 1, p. .05*

The thematic analysis of the whole corpus of collected statements used to describe competent and intelligent students reveals the complex nature characterizing the consensual universe semantic organization.

First of all the picture (Fig. 2) shows that thematic clusters cannot be clearly partioned between those related to competence and those related to intelligence, in fact none of the two factor dimensions we selected as the most explicative in terms of variance, is able to produce a neat separation.

To corroborate this fact we notice that the meanings overlapping becomes more evident at the sentence level (cf. Table 14), in fact, inside the same cluster, there are often similar elementary contexts both produced thinking of intelligent students or thinking of competent students.

Nevertheless clear regularities are recognizable through the observation of sentences belonging to the same thematic cluster. One of the most noticeable can be identified at the sentence level: Intelligence related elementary contexts refers mainly to general cognitive characteristics, while competence related elementary contexts mainly refer to specifications student related characteristics (Box 1).

But at the same time we cannot help but notice that, at least in some cases, exactly the same statement has been associated to elementary contexts both referring to competence and to intelligence (Box 2). In order to complete our study of the consensual universe semantic structure we matched the two sub-corpora analyses with the whole corpus analysis. From this comparison we expect to understand how meaning structure changes when the notions of competence and intelligence interact.

Box 1–Ddifferences in specificity of contents related to competence and intelligence

Cluster: CI2_NOZIONE

intelligence: agire in_modo_da ottenere i massimi risultati con il minimo sforzo possibile

competence: Ottenere ottimi o buoni_risultati all'esame

Cluster: CI1_PROBLEMI

intelligence: trovare nuove strategie per risolvere i problemi

competence: dimostrarsi capace di affrontare e risolvere i problemi che si presentano nello studio

Box 2– Differences in specificity of contents related to competence and intelligence

Cluster: CI6_STUDIO

intelligence: impegnarsi nello studio

competence: impegnarsi nello studio

Table 23- Thematic analysis comparisons results

	SUB-CORPUS ANALYSIS			***WHOLE CORPUS ANALYSIS***			
	Label	***Description***		***Label***	***Description***	***% statements***	
COMP	C2_STUDIO	*Organizing own study*		CI6_cSTUDIO	*Organizing own study*	80,95%	***COMP***
	C1_LEZIONE	*Attending classes*		CI7_cLEZIONE	*Attending classes*	80,00%	
	C5_CONOSCENZA	*Acquiring knowledge*					
	C4_STRUMENTO	*Using knowledge and tools*		CI3_cCONOSCENZE	*Using knowledge and tools*	65,00%	
	C3_COMPITO	*Achieving results*		CI2_iNOZIONE	*Performance effectiveness*	38,10%	
INTE	*I4_CONCETTO*	*Acquiring and linking concepts abilities*		*CI4_iCONCETTO*	*Readiness*	*95,00%*	***INTE***
	I1_LEZIONE	*Readiness*					
	I3_CAPACITÀ	*Effective use of cognitive abilities*		*CI5_iCAPACITÀ*	*Cognitive effectiveness*	*85,00%*	
	I2_INFORMAZIONE	*Problem solving ability*		*CI1_iPROBLEMI*	*Problem solving* ability	*65,00%*	

The whole meaning structure of contents related to competence and intelligence does not change much between different analysis: the number of thematic clusters identified analyzing the whole corpus is similar (9 vs 7) and the contents of similar clusters between different thematic analyses is similar too (cf. Table 23).

Specifically in four (CI4, CI5, CI6, CI7) of the seven clusters resulting from the whole corpus analysis there is a clear predominance of elementary contexts belonging to one notion rather than the other (cf. Table 23). The categorization of the three remaining clusters is less straightforward (CI3, CI1 but particularly CI2). We hence assume that the latent semantic structure of the notions is different, but we can't state that people are always able to differentiate these notions. In fact the sentences contained in each thematic clusters are mixed (sentences related both to competence and intelligence belong to the same cluster): i.e. participants used similar sentences even if they refer to different notions.

To conclude, we state that in the consensual universe the notions of competence and intelligence, though represented by distinct semantic structures, can (at least partly) be confused: someone calls competence what someone else calls intelligence and viceversa.

Study II.b - Reconstructing the reified universe of competence and intelligence

Method

The goal of this study is the reconstruction of the reified universe (systematic academic knowledge) for both the notions of competence and intelligence. Since it is not possible, under strict constraints of time and budget, to collect a meaningful sample of statements directly from scholars, we decided of collecting those statements from written resources like scientific papers and handbooks.

Sample

Scientific literature on competence and intelligence is extensive, for this reason we restricted our sources of information to a short selection of books and paper reviews.

The primary sources we used to collect academic information on the notion of competence are the following:

- (Weinert, 2001): A comprehensive literature review used to ground the OECD-DeSeCo (Definition and Selection of key Competencies) program.
- (Elliot & Dweck, 2005): A handbook of psychology dedicated to the notion of competence and motivation.
- (Ajello, 2002): A comprehensive Italian essay on the notion of professional competence, containing a chapter devoted specifically to the use of competence in the educational context.

The primary source we used to collect academic information about the notion of intelligence are the following:

- (Neisser, 1996) A comprehensive literature review.

In order to represent also hybrid positions of the pathway between competence and intelligence we refer also to the following:

- (McClelland, 1973): A scientific paper that critically discusses the concept of intelligence and introduces that of competence.

Procedure

In order to collect the set of statements needed to realize a content analysis reproducing the same procedure implemented for the consensual universe, we summarized all the resources and extracted from these a list of short sentences that constituted the corpus we needed to study the reified universe of the notions of competence and intelligence. With the aim of understanding the latent semantic structure of the meanings associated with the different definitions of competence and intelligence we classified all the statements according to their theory of reference (Cf. Table 17).

The preparation of the corpus for T-Lab analysis followed the same manual normalization procedure which was performed on the corpus of consensual universe. When importing , T-Lab software submitted the corpus to a semiautomatic normalization procedure (Lancia, 2011; p. 172). The parameters setting has been the same we used to analyze the corpus consensual universe.

Table 17 – Labels used to tag competence and intelligence related statements reference theories

Label	***Description***
DEF_CC	COMP – Key competencies
DEF_CCM	COMP - Combination of cognitive and motivational constructs
DEF_CPGD	COMP - General and dispositional psychological construct
DEF_HCM	COMP - Handbook of competence and motivation
DEF_M	COMP- Motivation
DEF_PP	COMP - Predisposition to performance
DEF_BA	INTE - Biological approaches
DEF_CV	INTE -Cultural variation
DEF_DP	INTE -Developmental progressions
DEF_MF	INTE - Multiple forms of intelligence
DEF_PA	INTE - Psychometric approach

Table 18 – Reified universe corpus descriptive statistics

COUNTER NAME	WHOLE CORPUS	COMPETENCE SUBCORPUS	INTELLIGENCE SUBCORPUS
Variables	2		
Entries	161	135	26
Lemmas	280	200	49
Lemmatized words	371	243	56
Word forms in the dictionary	435	294	67
Tokens	1171	562	110
Words with 1 occurrence (hapax)	267	202	50
Stopwords	102	102	102
Multiwords	14	6	1
T-LAB key terms	41 (f >3)		
Key terms	110 (f >1)		
Lemmas excluded from analysis			0

The corpus imported in T-lab is composed of 161 simple sentences (135 referring to competence and 26 referring to intelligence) and 280 lemmas (200 appearing in sentences referring to competence and 49 appearing in sentences referring to intelligence; see Table 18 for more details).

Measures

Because of the limited size of the intelligence and competence sub-corpora we couldn't perform the full set of analysis as we did for the consensual universe. Precisely we did not perform the specificity analysis and concerning the thematic analysis we performed it only on the whole corpus.

Results

In this section we present the thematic analysis performed on the whole corpus. The parameters setting is the same we used for the whole consensual universe corpus analysis.

T-lab identified and labeled four clusters (Table 19). In order to distinguish cluster labels we placed before the label the prefix "CI", as "Competence/Intelligence" followed by a number.

Table 19 - Thematic clusters emerging from the elaboration of 132 out of 161 (82%) statements.

Description	*Number of contexts*	*%*
CI1_PRESTAZIONE	40	30.3%
CI2_COMPETENZA	26	19.7%
CI3_ RISULTATI	21	15.9%
CI4_CONOSCENZE	45	34.1%

Table 20 - Samples of characteristic words members of the identified thematic clusters.

CI1_PRESTAZIONE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Competente*	34.279	13	13
Offrire*	23.532	9	9
Prestazione*	20.416	14	19
Sentire	15.590	6	6
Compito*	11.708	6	7
Differente	10.350	4	4
Diventare	10.350	4	4
Livelli*	10.350	4	4
Successo	10.350	4	4
Termine	10.350	4	4
DEF:M	10.350	4	4
produrre	9.205	5	6
DEF:HCM	6.023	15	32
Innato	4.408	3	4
TYPE:COMP	4.173	39	109

CI2_COMPETENZA			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Dimostrare*	48.080	11	11
Competenza*	33.795	12	16
Propria	25.951	6	6
Test	21.581	5	5
Svolgere	12.243	4	5

CI3_ RISULTATI			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Obiettivo*	34.350	8	9
Raggiungere*	30.301	6	6
Caratteristica	25.198	5	5
Ottenere	19.872	6	8
Risultato*	19.389	5	6
Situazione	6.483	4	8

CI4_CONOSCENZE			
LEMMA	**CHI SQUARE**	**EC IN CLUSTER**	**EC IN TOTAL**
Possedere*	32.025	31	40
Conoscenze*	23.452	13	13
Capacità*	16.01	9	9
Abilità*	11.779	10	12
Astratto	7.081	4	4
Necessario	7.081	4	4
Proprie	5.816	5	6
DEF:CC	5.019	7	10
Competenze	4.175	4	5
Determinato	4.175	4	5
Pratica	4.175	4	5

EC IN CLUSTER: elementary contexts in the cluster containing the specific lemma

EC IN TOTAL : elementary contexts in the whole corpus containing the specific lemma

CHI SQUARE : significance of a word occurrences within an elementary context

* : identify words chosen by T-Lab to describe the content of each cluster

Table 21 - Selection of elementary contexts sorted by chi-square descending order grouped by clusters.

CI1_PRESTAZIONE	Causes of differences in performances
Score	**EC**
41,79	offre prestazioni rispetto ad un compito differenti da chi non è competente
41,22	offre livelli di prestazione differenti da chi non è competente
21,55	offre livelli di prestazione differenti a seconda dall'ambito in cui si trova
13,57	offre prestazioni differenti anche in funzione di fattori diversi dalla presenza della competenza
13,57	offre livelli di prestazione che dipendono dalla situazione in cui la competenza si esprime

CI3_ RISULTATI	Achieving goals
Score	**EC**
143,17	è responsabile dei risultati che ottiene, richiede informazioni sul risultato ottenuto direttamente, sceglie liberamente gli obiettivi da raggiungere
21,55	raggiungere i propri obiettivi, se possiede intelligenza pratica
21,55	raggiunge i propri obiettivi
21,55	raggiunge gli obiettivi definiti da qualcun altro
21,55	raggiunge obiettivi di prestazione

CI2_COMPETENZA	Differences in showing ability
Score	**EC**
64,7	dimostra la propria competenza producendo diverse prestazioni in uno specifico arco_di_tempo
64,7	dimostra la propria competenza nella singola prestazione
32,75	è soddisfatto per aver dimostrato competenza
32,75	dimostra la sua competenza sulla_base di un criterio prestabilito
27,86	lo dimostra in appositi test

CI4_CONOSCENZE	Possessing knowledge and abilities
Score	**EC**
40,71	possiede tutte le abilità necessarie ad applicare le conoscenze astratte in situazioni concrete
39,26	è convinta di possedere le conoscenze e le abilità necessarie per riuscire un determinato contesto
30,96	possiede conoscenze, credenze e sentimenti circa le proprie capacità e tecniche
26,69	possiede tutte le conoscenze astratte che caratterizzano un determinato ambito
20,47	non possiede necessariamente un quoziente d'intelligenza (QI) elevato, se possiede intelligenza pratica

Score: relevance assigned to the elementary context (Lancia, 2011; p. 79).

EC: elementary context.

Table 22 –Summary of the whole corpus semantic structure

Label	**Key concept**	***Tot. EC***	**COMP. EC***	**COMP. EC %**	***INTE. EC****	***INTE.* EC %**
CI1_PRESTAZIONE	Causes of differences in performances	40	21	100,00%	0	,00%
CI3_RISULTATI	Achieving goals	*21*	17	80,95%	4	19,05%
CI4_CONOSCENZE	Possessing knowledge and abilities	*45*	16	80,00%	4	20,00%
CI2_COMPETENZA	Differences in showing ability	26	14	70,00%	6	30,00%

* *number of elementary contexts having chi square > 3.84, df = 1, p. .05*

The thematic analysis of the whole corpus of collected statements used by scholars to describe competence and intelligence points out the role of people actions (CI1), ends (CI3), contents and tools (CI4, CI2). At the same time points out the framing characterizing the academic approach: attention to causes of variations (CI1), variations (CI2), independent variables (CI4), and dependent variables (CI3).

The number of statements associated with the notion of competence largely outnumbers that of statements associated with those of intelligence, given that we chose not to infer from sub-corpus sentences frequencies the thematic clusters prevailing belonging to competence vs. intelligence.

We delay the labeling of clusters according to competence and intelligence to the general discussion, when we will compare results of the consensual universe with that of the reified universe.

Discussion

We have reconstructed the semantic structure of both the consensual universe (Study II.a) and the reified universe (Study II.b); we are now ready to discuss their comparison. To achieve this goal we matched the contents of the thematic clusters resulting from the whole corpus analysis applied to consensual and reified universes.

To build the matching we focused our attention on statements contents even if the organization of content between the two universes: in the consensual universe knowledge is mainly composed of simple instances, while in the reified universe knowledge mainly refers to general concepts linked together by general relations (cf. Table 24).

We now can infer, from the consensual point of view, the belonging of the thematic clusters the notions, emerged from the reified universe analysis: we have marked as intelligence related those clusters described as "Causes of differences in performances" (CI1) and "Achieving goals" (CI3), and as competence related those clusters described as "Differences in showing ability " (CI2), and "Possessing knowledge and abilities " (CI4).

Accepting this inference we formulate the following consideration regarding the structure of the social representations: when people describe intelligence, they refer to the possession of qualities that cause the performance and enable people possessing those qualities produce an effective performance; when people attribute competence they refer to the performance expressed in tasks considered relevant to a specific role (i.e. student) and the way tools and knowledge have been used in that task.

Table 24 - Comparison among clusters emerging from the reified universe and the consensual universe separated whole corpora analysis

Consensual Universe					**Reified Universe**	
Type	**INTE. EC %**	**COMP. EC %**	**Cluster**	**Description**	**Cluster**	**Description**
INTE	95,00%	5,00%	*CI4*	*Readiness*	*CI1*	*Causes of differences in performances [actions; causes of variations]*
	85,00%	15,00%	*CI5*	*Cognitive effectiveness*		
	61,90%	38,10%	*CI2*	*Performance effectiveness*		
	65,00%	35,00%	*CI1*	*Problem solving ability*	*CI3*	*Achieving goals [ends; dependent variables]*
COMP	19,05%	80,95%	*CI6*	*Organizing own study*	*CI2*	*Differences in showing ability [contents and tools; variations]*
	20,00%	80,00%	*CI7*	*Attending classes*		
	35,00%	65,00%	*CI3*	*Using knowledge and tools*	*CI4*	*Possessing knowledge and abilities [contents and tools; independent variables]*

Study III - Selecting the position-taking principles for competence and intelligence

Through study II we collected statements belonging to both the consensual and the reified universe and analyzed its content implementing a computer assisted content analysis process based on the T-Lab software. As we explained in presenting T-Lab, all the process is based on metrics based on words and co-occurrences counts that, to lead to acceptable results, need large amounts of contents to be processed. This computer assisted process is useful to bring out core meanings and meaning structure as we showed in the previous paragraphs, but to achieve this goal it cuts off all the peripheral information for which frequencies needed for calculations are too small.

In order to recover some of the lost information in this chapter we implemented a completely manual content analysis procedure. The second result will be the selection of a representative set of statements to be used as position-taking principles (Doise, 1986) necessary for the implementation of the second of the three phases model (Doise, Clémence & Lorenzi-Cioldi, 1992).

Method

Sample and procedure

Because we started from the same content used in study II, for the description of the sample, we refer to the corresponding section of this study.

The first step of the manual procedure we implemented in this study was focused on the identification and categorization of keywords to be used to select the categories for the manual statements categorization step. The output of this step is a multilevel structure of labels (cf. Box 3). Starting from this structure we selected a set of 10 labels to be used in a three human judges manual classification task (cf. Table 25).

Box 3 – Keywords classification structure.

1. PERSONA:
1.1.1. CAPACITA POSSEDUTE DA PERSONA:
1.1.1.1. cognitive,
1.1.1.1.1.1. meta-cognizione/controllo,
1.1.1.1.1.2. memoria,
1.1.1.1.1.3. organizzaz./pianificazione,
1.1.1.1.1.4. ragionamento,
1.1.1.1.1.5. fare collegamenti,
1.1.1.2. non cognitive
1.1.1.2.1.1. volontà,
1.1.1.2.1.2. attenzione,
1.1.1.2.1.3. motivazione,
1.1.1.2.1.4. emozione,
1.1.1.2.1.5. consapevolezza,
1.1.1.2.1.6. azione,
1.1.1.3. derivate
1.1.1.3.1.1. sociale,
1.1.1.3.1.2. apprendimento,
1.1.1.3.1.3. comprensione,
1.1.1.3.1.4. ascolto,
1.1.1.3.1.5. critica,
1.1.1.3.1.6. espressione,
1.1.1.3.1.7. intuizione,
1.1.1.3.1.8. problem solving,
1.1.1.3.1.9. studio,
1.1.1.3.1.10. trasferimento,
1.1.1.3.1.11. argomentare,
1.1.1.3.1.12. parlare,
1.1.1.3.1.13. contare,
1.1.1.3.1.14. analisi/sintesi,
1.1.1.3.1.15. cercare,
1.1.1.3.1.16. integrare

1.1.2. CARATT. POSSEDUTE DA PERSONA
1.1.2.1.1. competenze,
1.1.2.1.2. conoscenze,
1.1.2.1.3. strumenti,
1.1.2.1.4. strategie,
1.1.2.1.5. obiettivi ,
1.1.2.1.6. regole
1.1.3. CARATT. PERSONA IN AZIONE
1.1.3.1.1. novizio/esperto,
1.1.3.1.2. reattività/proattività,
1.1.3.1.3. facilità/difficoltà,
1.1.3.1.4. velocità/lentezza,
1.1.3.1.5. flessibile/rigida,
1.1.3.1.6. perseveranza, impegno,
1.1.3.1.7. sforzo,
1.1.3.1.8. volontario/automatico,
1.1.3.1.9. riesce,
1.1.3.1.10. padroneggia
1.1.3.1.11. sfrutta,
1.1.3.1.12. aperto/chiuso,
1.1.3.1.13. abile,
1.1.3.1.14. efficace,
1.1.3.1.15. efficiente,
1.1.3.1.16. diligente,
1.1.3.1.17. affidabile,
1.1.3.1.17. costante,
1.1.3.1.18. informato,
1.1.3.1.19. aggiornato,
1.1.3.1.20. brillante

2. COMPITO:
2.1.1. CARATT. COMPITO:
2.1.1.1.1. familiarità/novità,
2.1.1.1.2. facile/difficile

3. PRESTAZIONE:
3.1.1. CARATT. PRESTAZIONE:
3.1.1.1.1. dipendenza/indipendenza contesto
3.1.1.1.2. efficace,
3.1.1.1.3. qualità superiore/eccellente

4. NOZIONE:
4.1.1. CARATT. NOZIONE
4.1.1.1.1. propria/altrui
4.1.1.1.2. monolitica/molteplice,
4.1.1.1.3. dipendente/indipendente
4.1.1.1.4. specifica/generica,
4.1.1.1.5. particolare/generale,
4.1.1.1.6. particolare/trasversale,
4.1.1.1.7. stabile/instabile,
4.1.1.1.8. misurabile/non misurabile,
4.1.1.1.9. dipendenza/indipendenza contesto,
4.1.1.1.10. innata/appresa/sviluppata,
4.1.1.1.11. individuale/collettiva, sociale,
4.1.1.1.12. naturale/culturale

5. ATTRIBUZIONE:
5.1.1. DIREZIONE ATTRIBUZIONE
5.1.1.1.1. auto-percezione,
5.1.1.1.2. percezione da esterno,
5.1.1.1.3. giudizio sociale
5.1.2. CONTENUTO ATTRIBUZIONE
5.1.2.1.1. livello di competenza
5.1.2.1.2. livello di autostima
5.1.2.1.3. positiva/negativa

6. DEFINIZIONE

Table 25 – Mapping between selected lables and results from study II

ID	*TAGS*	*Items*	*Ratio (Items/Total)*	*Items INTE*	*Ratio (INTE /Total)*	*Items COMP*	*Ratio (COMP /Total)*
1.	*CAPACITA POSSEDUTE DALLA PERSONA: derivate*	*111*	*25,11%*	*40*	*23,95%*	*71*	*25,82%*
2.	*CAPACITA POSSEDUTE DALLA PERSONA: cognitive*	*79*	*17,87%*	*47*	*28,14%*	*32*	*11,64%*
3.	*CARATTERISTICHE DELLA NOZIONE*	*71*	*16,06%*	*23*	*13,77%*	*48*	*17,45%*
4.	*CARATTERISTICHE DELLA PERSONA IN AZIONE*	*58*	*13,12%*	*20*	*11,98%*	*38*	*13,82%*
5.	*CARATTERISTICHE DELLA PRESTAZIONE*	*50*	*11,31%*	*14*	*8,38%*	*36*	*13,09%*
6.	*CARATTERISTICHE POSSEDUTE DALLA PERSONA*	*25*	*5,66%*	*3*	*1,80%*	*22*	*8,00%*
7.	*DIREZIONE DELL'ATTRIBUZIONE*	*22*	*4,98%*	*2*	*1,20%*	*20*	*7,27%*
8.	*CARATTERISTICHE DEL COMPITO*	*16*	*3,62%*	*14*	*8,38%*	*2*	*,73%*
9.	*CAPACITA POSSEDUTE DALLA PERSONA: non cognitive*	*9*	*2,04%*	*3*	*1,80%*	*6*	*2,18%*
10.	*DEFINIZIONE*	*1*	*,23%*	*1*	*,60%*	*0*	*,00%*
	Total	***442***	***100,00%***	***167***	***100,00%***	***275***	***100,00%***

Table 26 – Mapping between selected lables and results from study II

ID	**Classification Labels**	**Type**	**Consensual Universe**	**Reified Universe**
1.	CAPACITA POSSEDUTE DALLA PERSONA: derivate	*INTE*	*CI1 Problem solving ability*	*CI3 Achieving goals*
		COMP	*CI6 Organizing own study*	*CI2 Differences in showing ability*
			CI7 Attending classes	
2.	CAPACITA POSSEDUTE DALLA PERSONA: cognitive	*INTE*	*CI5 Cognitive effectiveness*	*CI1 Causes of differences in performances*
4.	CARATTERISTICHE DELLA PERSONA IN AZIONE	*INTE*	*CI4 Readiness*	*CI1 Causes of differences in performances*
			CI2 Performance effectiveness	
6.	CARATTERISTICHE POSSEDUTE DALLA PERSONA	*COMP*	*CI3 Using knowledge and tools*	*CI4 Possessing knowledge and abilities*
9.	CAPACITA POSSEDUTE DALLA PERSONA: non cognitive	*None*	*No category*	*No category*
3.	CARATTERISTICHE DELLA NOZIONE	*None*	*No category*	*No category*
5.	CARATTERISTICHE DELLA PRESTAZIONE	*None*	*No category*	*No category*
7.	DIREZIONE DELL'ATTRIBUZIONE	*None*	*No category*	*No category*
8.	CARATTERISTICHE DEL COMPITO	*None*	*No category*	*No category*
10.	DEFINIZIONE	*None*	*No category*	*No category*

Table 27 – Kohen's Kappa values for inter-rater agreement (n=442)

Judge	A	B
B	,788	
C	,361	,429

The keyword classification structure and the corresponding labels selected are compatible with the analysis resulting from study II (cf. Table 26). The labels selected are a superset of the labels emerging from the analysis of the reified and the consensual universe. The labels without a correspondence represent the portion of content that had been left behind by the computer assisted analysis.

In the third step of the procedure in correspondence to a preliminary classification, we performed a sentence selection using as exclusion criterion the following: if a statement with a similar content is already present in the restricted set then choose between the two statements that expressing better it's content. Applying this rule we reduced the number of elements to be classified form 1335 to 442 (to see the distribution of the statements with respect to the selected labels see Table 25).

Given the reduced set of statements we refined the categorization and we asked two scholars to classify this set independently. Once classified and discussed together with the other judges on the uncertain classifications we performed an inter-rater analysis.

The level of agreement varies from poor (less then ,4) to good (greater than ,6) hence we decided to chose the classification of the judge that obtained the highest average Kohen's Kappa value (Judge B; cf. Table 27).

Results

Once defined the final reference classification we again reduced the number of statements to be retained hereinafter (from 442 to 70) applying the following inclusion criterion: for each group of statements labeled with the same label include in the new reduced set only those statements judged necessary and sufficient to represent the content described by that label, possibly giving representation to statements referring both to competence and intelligence (cf. Table 28 and 29).

Discussion

The manual content analysis procedure implemented in this chapter deepened our knowledge of the semantic structure characterizing the representational field we are studying. The results obtained does not contradict the computer assisted analysis performed in study II. Thanks to this procedure we have been able to recover six latent dimensions (cf. Table 6) ignored by the computer assisted analysis. Among the weaknesses of the manual content analysis there is certainly the fact that the identification the categories relies heavily on the researcher's knowledge of the field under observation.

From a methodological point of we believe that the choice of performing two parallel kinds of content analysis helped us limit the negative side effects implicit in each of the separate analysis: on one side the computer assisted content analysis helped us in controlling and reducing the influence of the researcher knowledge on the process , and the manual content, on the other side, analysis helped us to include peripheral information.

Table 28 – Comparison between descriptive statistics of the first and second set of selected items.

ID	***TAGS***	***Items***	***Ratio (Items/Total)***	***Selected Items INTE***	***Selected Items COMP***	***Selected items Total***	***Ratio (Sel.Items/ Sel.Total)***	***Ratio (Items/ Sel.items)***
1.	*CAPACITA POSSEDUTE DALLA PERSONA: cognitive*	*79*	*17,87%*	*8*	*8*	*16*	*23,94%*	*21,52%*
2.	*CAPACITA POSSEDUTE DALLA PERSONA: derivate*	*111*	*25,11%*	*3*	*10*	*13*	*18,31%*	*11,71%*
3.	*CARATTERISTICHE DELLA NOZIONE*	*71*	*16,06%*	*7*	*5*	*12*	*16,90%*	*16,90%*
4.	*CARATTERISTICHE DELLA PRESTAZIONE*	*50*	*11,31%*	*2*	*7*	*9*	*12,68%*	*18,00%*
5.	*CARATTERISTICHE DELLA PERSONA IN AZIONE*	*58*	*13,12%*	*2*	*5*	*7*	*9,86%*	*12,07%*
6.	*DIREZIONE DELL'ATTRIBUZIONE*	*22*	*4,98%*	*1*	*6*	*7*	*9,86%*	*31,82%*
7.	*CARATTERISTICHE DEL COMPITO*	*16*	*3,62%*	*3*	*0*	*3*	*4,23%*	*18,75%*
8.	*CARATTERISTICHE POSSEDUTE DALLA PERSONA*	*25*	*5,66%*	*1*	*1*	*2*	*2,82%*	*8,00%*
9.	*DEFINIZIONE*	*1*	*,23%*	*1*	*0*	*1*	*1,41%*	*100,00%*
10.	*CAPACITA POSSEDUTE DALLA PERSONA: non cognitive*	*9*	*2,04%*	*0*	*0*	*0*	*,00%*	*,00%*
	Total	***442***		***28***	***42***	***70***		

Table 29 – Statements selected to represent the reified and consensual universe

Id	Statement	Type	label Id
1.	Ragiona in modo completo in ogni circostanza	COMP	2
2.	Possiede capacità intellettive generali	COMP	2
3.	Mostra di sapersi gestire	COMP	2
4.	Fa collegamenti tra le conoscenze acquisite	COMP	2
5.	Costruisce collegamenti tra le azioni che compie	COMP	2
6.	Analizza la situazione in cui si trova	COMP	2
7.	Controlla se sta facendo bene ciò che vuole fare	COMP	2
8.	Identifica ciò che serve per padroneggiare la situazione in cui si trova	COMP	2
9.	Crea collegamenti tra le cose che sa	INTE	2
10.	Rielabora le conoscenze che apprende	INTE	2
11.	Ha facilità nella memorizzazione	INTE	2
12.	Non fatica nel ragionamento	INTE	2
13.	Pensa al suo futuro	INTE	2
14.	Ricorda ciò che ha imparato, anche a distanza di tempo	INTE	2
15.	Organizza le sue priorità per massimizzare il risultato	INTE	2
16.	Gestisce in modo ottimale i tempi	INTE	2
17.	Si esprime correttamente	COMP	1
18.	"Sa fare"	COMP	1
19.	Comprende ciò che gli viene chiesto e agisce di conseguenza	COMP	1
20.	Acquisisce nuove conoscenze e capacità	COMP	1
21.	Si riconosce quando lavora	COMP	1
22.	Impara anche svolgendo i compiti che servono per misurare la sua competenza	COMP	1
23.	Sviluppa proprie idee su ciò che apprendere.	COMP	1
24.	Conosce il modo di dare soluzione a problemi	COMP	1
25.	Applica in modo efficace le conoscenze alla pratica	COMP	1
26.	Diventa competente poiché può imparare	COMP	1
27.	Comprende molte cose, anche in ambiti cui non è competente	INTE	1
28.	Non è necessariamente brava a scuola, se possiede intelligenza pratica	INTE	1
29.	È critica	INTE	1
30.	Dimostra maggiore intelligenza se ha familiarità con il compito che svolge	INTE	8
31.	Coglie velocemente collegamenti e concetti anche difficili	INTE	8
32.	Capisce al volo le cose	INTE	8
33.	Possiede un insieme di capacità innate	COMP	3
34.	Lo dimostra competenza superando specifici test	COMP	3
35.	È diventato competente	COMP	3
36.	Dipende da ciò che la società valorizza	COMP	3
37.	Ha più possibilità nella vita di uno che non è competente	COMP	3
38.	Non può dimostrarlo attraverso i test di intelligenza	INTE	3
39.	Possiede un cervello dotato di particolari caratteristiche fisiologiche	INTE	3
40.	Diventa intelligente con l'età	INTE	3
41.	Può eccellere in alcuni ambiti piuttosto che in altri	INTE	3
42.	Dimostra di essere intelligente in appositi test	INTE	3
43.	Possiede un quoziente intellettivo (QI) alto	INTE	3
44.	Diventa intelligente interagendo con le altre persone	INTE	3
45.	È dotato di una costanza che gli permette di portare a termine ciò che ha cominciato	COMP	4
46.	Si impegna molto	COMP	4
47.	Svolge il suo dovere con costanza	COMP	4
48.	Svolge il suo dovere rispettando i tempi	COMP	4
49.	Usa le abilità che possiede	COMP	4
50.	Alcune persone sono più intelligenti, altre lo sono meno	INTE	4
51.	Ottiene risultati eccellenti in alcuni ambiti specifici e riesce bene anche in molti altri ambiti	INTE	4
52.	Offre livelli di prestazione differenti a seconda dall'ambito in cui si trova	COMP	5
53.	Padroneggia le caratteristiche di uno specifico contesto	COMP	5
54.	Offre livelli di prestazione che dipendono dalla situazione in cui la competenza si esprime	COMP	5
55.	Ottiene buone prestazioni in un ambito specifico	COMP	5
56.	Offre una prestazione eccellente	COMP	5
57.	Porta a termine un compito	COMP	5
58.	Raggiunge gli obiettivi definiti da qualcun altro	COMP	5
59.	Riesce a scuola	INTE	5
60.	Dimostra di possedere le abilità proprie della cultura in cui vive	INTE	5
61.	Raggiunge i propri obiettivi	COMP	6
62.	Raggiungere i propri obiettivi, se possiede intelligenza pratica	INTE	6
63.	La scienza è riuscita a spiegare che cos'è l'intelligenza	INTE	10
64.	Si sente competente	COMP	7
65.	Vuole evitare di sentirsi incompetente	COMP	7
66.	Ha un bisogno fondamentale di sentirsi competente	COMP	7
67.	Possiede una elevata autostima	COMP	7
68.	Sa come comportarsi nel contesto sociale	COMP	7
69.	Ritiene che le risorse personali di cui dispone siano sufficienti a produrre la prestazione che desidera	COMP	7
70.	Ha successo grazie alla capacità di dimostrare competenze che in realtà non possiede	INTE	7

Chapter discussion

In this chapter we implemented a process compatible with the first phase of the three phases model (Doise, Clémence & Lorenzi-Cioldi, 1992). The final output of this process is a 70 statements set representing the position-taking principles used by student to attribute competence and/or intelligence to other students.

In the following chapter we will use this output to implement the second step of the three phases model devoted to the latent organizing principles identification. In fact we expect those position taking statements to be correlated and grouped together, according to a reduced set of factors that will represent the "*principle of generation and structuring of practices and representations*" (Bourdieu 2003; p. 206-207)

CHAPTER II - Understanding the competence-intelligence relation

Introduction

As we showed in Chapter I the semantic structure representing the features students use as principles when they are engaged in the task of judging competence and intelligence are not exclusively associated to one and only one of these notions. From this observation we asked ourselves how is it possible to measure the different styles in the way students combine features related to competence and/or intelligence. We claim, in fact, that students perceiving competence and intelligence as well separated notions would use disjoint sets of position-taking principles, one to attribute competence and the other to attribute intelligence. We claim, also, that students perceiving competence and intelligence as interdependent notions, would use the same set of position-taking principles both for judging competence and intelligence. To the latter case we ascribe two more possibilities:

1) students perceiving competence as dependent from intelligence would use a strict subset of intelligence position taking principles to judge competence.
2) students perceiving intelligence as dependent from competence would use a strict subset of competence position taking principles to judge intelligence.

Study IV.a - Automatic generation of competence-intelligence relation statements

Method

Procedure

To answer the research questions we formulated in the introduction we search for a set of statements useful to position students on their perception of competence-intelligence relation. We began considering the following direct and explicit sentence expressed by an generic agent Q (i.e. a student):

Q thinks "if P is X then P is Y" (P,Q are agents; X,Y are qualities)

This means that Q attributes to P the quality X then, as a consequence and directly, without accessing the clues used to attribute Y, Q attributes to P also the quality Y.

If we replace P with the word intelligence (INTE) and Q with the word competence (COMP), and if we replace P with the word competence (COMP) and Q with the word intelligence (INTE) we obtain the following two statements:

if a student is competent then is intelligent *(COMP => INTE)*

if a student is intelligent then is competent *(INTE => COMP)*

Considering these two statements together and at the same time, we can identify the different styles characterizing ways students combine features related to competence and/or intelligence (Box 4).

Box 4– Logical consequences of combining competence and intelligence

a)	COMP => INTE	and INTE => COMP	: attributes are interdependent
b)	COMP => INTE	and not INTE => COMP	: attribution depends on competence
c)	not COMP => INTE	and INTE => COMP	: competence depends on intelligence
d)	not COMP => INTE	and not INTE => COMP	: attributes are independent

In order to increase the robustness of our measure we analyzed the linguistic uses of the words competence and intelligence and, more generally, we studied the structure of sentences related to the attribution of properties to agents.

We identified many verbs besides "to be" that can be used to couple an agent to an attribute, carrying over many shades in meaning: sentirsi, attribuirsi, possedere, dimostrare, apparire, acquisire (feeling, giving, possessing, showing, appearing, acquiring). Together with the verb we identified many other variable parts in the sentence: The verb tense (past, present and future); the possibility of the negation of the antecedent and/or of the consequent of the implication; the use of quantifiers immediately before the attribute. Given those sources of variability we created a configurable Perl (a general-purpose scripting language created to make text processing easier) script to generate all possible sentences accordingly.

Results

As a first experiment we configured the script to generate all the sentences according to all the defined sources of variability (Box 5).

Box 5 – The complete set of linguistic constraints used to generate the first set of statements

Se una persona
NEGATION: [_|non]
VERB: [essere|sentirsi|possedere|dimostrare|sembrare|acquisire|attribuirsi] x {passato|presente|futuro}
QUANTIFIER: [_|molta|poca]
ATTRIBUTE: [intelligenza|competenza] x {singolare|plurale}
allora
NEGATION: [_|non]
VERB: [essere|sentirsi|possedere|dimostrare|sembrare|acquisire|attribuirsi] x {passato|presente|futuro}
QUANTIFIER: [_|molta|poca]
ATTRIBUTE: [intelligenza|competenza] x {singolare|plurale}

Box 6 – A sample of the first set of automatically generated sentences

…
Se una persona dimostra poca intelligenza allora non è poco competente.
Se una persona dimostra poca intelligenza allora è intelligente.
Se una persona dimostra poca intelligenza allora è molto intelligente.
…
Se una persona acquisisce poca intelligenza allora non ha posseduto competenze.
Se una persona acquisisce poca intelligenza allora non ha posseduto molte competenze.
Se una persona acquisisce poca intelligenza allora non ha posseduto poche competenze.
Se una persona acquisisce poca intelligenza allora ha posseduto intelligenze.
…
Se una persona non dimostrerà molte competenze allora non ha posseduto intelligenze.
Se una persona non dimostrerà molte competenze allora non ha posseduto molte intelligenze.
Se una persona non dimostrerà molte competenze allora non ha posseduto poche intelligenze.
Se una persona non dimostrerà molte competenze allora ha dimostrato competenze.
Se una persona non dimostrerà molte competenze allora ha dimostrato molte competenze.
…

The number of statements generated by the script is unmanageable (Box 6; n= 154.440), for this reason we reduced both the number of variables and the number of their possible levels. In particular we excluded the use of negations and quantifiers, fixed to the present form the verb tense, and reduced from seven to three the words to be used as possible verbs (Box 7).

Configuring the script in accordance with the reduced set of linguistic constraints, we generated a set of 56 statements. In order to test the latent factorial structure characterizing the set of statements and to collect information about participants perception facing such a set, we created a questionnaire containing 56 items, each associated to a seven levels of Likert scale(1: strongly disagree; 7:strongly agree).

From the data analysis we expected to extract four factors: one corresponding to the rule COMP => INTE and containing all the items having competence as the antecedent and intelligence as the consequent, one corresponding to the rule INTE => COMP having intelligence as the antecedent and competence as consequent, a third corresponding to the rule INTE => INTE, and finally one corresponding to sentences ascribed to the rule COMP=> COMP.

Box 7 – The reduced set of linguistic constraints

Se una persona
VERB: [essere|dimostrare|apparire] x {presente}
ATTRIBUTE: [intelligenza|competenza] x {singolare|plurale}
allora
VERB: [essere|dimostrare|apparire] x {presente}
ATTRIBUTE: [intelligenza|competenza] x {singolare|plurale}

Table 30 – Complete list of the 56 automatic generated sentences

ID	Statement
1.	Se una persona è competente allora è intelligente.
2.	Se una persona è competente allora dimostra competenza.
3.	Se una persona è competente allora dimostra intelligenza.
4.	Se una persona è competente allora appare competente.
5.	Se una persona è competente allora appare intelligente.
6.	Se una persona è competente allora dimostra competenze.
7.	Se una persona è competente allora dimostra intelligenze.
8.	Se una persona è intelligente allora è competente.
9.	Se una persona è intelligente allora dimostra competenza.
10.	Se una persona è intelligente allora dimostra intelligenza.
11.	Se una persona è intelligente allora appare competente.
12.	Se una persona è intelligente allora appare intelligente.
13.	Se una persona è intelligente allora dimostra competenze.
14.	Se una persona è intelligente allora dimostra intelligenze.
15.	Se una persona dimostra competenza allora è competente.
16.	Se una persona dimostra competenza allora è intelligente.
17.	Se una persona dimostra competenza allora dimostra intelligenza.
18.	Se una persona dimostra competenza allora appare competente.
19.	Se una persona dimostra competenza allora appare intelligente.
20.	Se una persona dimostra competenza allora dimostra competenze.
21.	Se una persona dimostra competenza allora dimostra intelligenze.
22.	Se una persona dimostra intelligenza allora è competente.
23.	Se una persona dimostra intelligenza allora è intelligente.
24.	Se una persona dimostra intelligenza allora dimostra competenza.
25.	Se una persona dimostra intelligenza allora appare competente.
26.	Se una persona dimostra intelligenza allora appare intelligente.
27.	Se una persona dimostra intelligenza allora dimostra competenze.
28.	Se una persona dimostra intelligenza allora dimostra intelligenze.
29.	Se una persona appare competente allora è competente.
30.	Se una persona appare competente allora è intelligente.
31.	Se una persona appare competente allora dimostra competenza.
32.	Se una persona appare competente allora dimostra intelligenza.
33.	Se una persona appare competente allora appare intelligente.
34.	Se una persona appare competente allora dimostra competenze.
35.	Se una persona appare competente allora dimostra intelligenze.
36.	Se una persona appare intelligente allora è competente.
37.	Se una persona appare intelligente allora è intelligente.
38.	Se una persona appare intelligente allora dimostra competenza.
39.	Se una persona appare intelligente allora dimostra intelligenza.
40.	Se una persona appare intelligente allora appare competente.
41.	Se una persona appare intelligente allora dimostra competenze.
42.	Se una persona appare intelligente allora dimostra intelligenze.
43.	Se una persona dimostra competenze allora è competente.
44.	Se una persona dimostra competenze allora è intelligente.
45.	Se una persona dimostra competenze allora dimostra competenza.
46.	Se una persona dimostra competenze allora dimostra intelligenza.
47.	Se una persona dimostra competenze allora appare competente.
48.	Se una persona dimostra competenze allora appare intelligente.
49.	Se una persona dimostra competenze allora dimostra intelligenze.
50.	Se una persona dimostra intelligenze allora è competente.
51.	Se una persona dimostra intelligenze allora è intelligente.
52.	Se una persona dimostra intelligenze allora dimostra competenza.
53.	Se una persona dimostra intelligenze allora dimostra intelligenza.
54.	Se una persona dimostra intelligenze allora appare competente.
55.	Se una persona dimostra intelligenze allora appare intelligente.
56.	Se una persona dimostra intelligenze allora dimostra competenze.

Study IV.b - Competence-intelligence relation organizing principles: exploration and core model extraction

Method

Sample

In order to test the factorial structure of the automatically generated set of 56 items we conducted a pilot study administering a questionnaire containing only the generated sentences to 148 third year students of the faculty of behavioral and social relations sciences at the beginning of one of their academic classes.

Procedure

The questionnaire has been presented as a paper and pencil activity prepared to facilitate the proper understanding of the academic class. After having terminated to fill in the questionnaire, participants were asked for their opinion on the task. The feedback we collected pointed out that the questionnaire has been perceived as an intelligence or logic test and that its completion was quite tiresome.

Results

Of the 148 collected questionnaires only two were completely white and one contained answers marked systematically the level one of associated Likert scale. We discarded them. The number of missing values was low, for this reason we replaced them with the correspondent mean item value. The limited number of not valid questionnaires and the limited number of missing values could be attributed to both to the setting, a hall that usually is used for classes and exams that implicitly ask for a task completion, and to the presentation of the task that seemed a legitimate request coming from the lecturer.

Collected data has been analyzed with SPSS 19 applying a maximum likelihood factor analysis with varimax orthogonal rotation. We fixed the number of factors to four, as previously conjectured (Table 31).

Discussion

The first factor, except for items 8 and 16 that should have been members of the second factor, contains exactly those items we expected for the relation COMP=> INTE. Same result for the second factor that contains almost all items for the relation INTE => COMP, except for item 33 that should have been member of the fourth factor. The content of factors one and two is consistent with expectations, but factors three and four are not. Through factors three and four we see the emergent distinction between, on one side (factor three) the association of the verbs “to be” (essere) and “to show” (dimostrare), and on the other side (factor four), the verb “to appear” (apparire), in both cases as sentence antecedents. In factor three and four there is no trace of the distinction among sentences of type INTE => INTE, and COMP=>COMP as we would have expected instead. This could mean that the positioning of participants on items that refer to the same notion in the antecedent and in the consequent of the sentence (INTE => INTE, COMP=>COMP), even when taking into account different notions, is highly correlated. The element acting as the partitioner for those statements could be exactly the verb used in the antecedent.

Given the negative feedback we received concerning the students feeling produced by the questionnaire (they perceived it as an intelligence test and found its filling in tiresome) we decided to reduce the items' set size.

We started the reduction considering that factors three and four are out of the scope of our research, therefore we excluded their items. Considering the fact that the verbs "to be" and "to show" have overlapping meanings (they are in fact members of the same factor) we limit to two the number of verbs in the sentence generation process (appear, show), excluding the verb "to be" considering it as redundant.

As regards to the plural and singular form of sentences we refer to the fact that this distinction does not induce any differentiation in the factor structure. To corroborate this assumption we have explored the correlation matrix of items differing only on the notions (intelligence and competence) number, showing that the magnitude of their correlation is strong enough to justify the exclusion of the plural one as redundant (Table 32).

Once reconfigured the script to generate statements excluding the discarded ones, we generated the new reduced set. The number of items generated decreased from 56 to 8. We added to the newly created set the two original statements where we used the verb "to be" because they are the source of our construct.

Table 33– The final two factors reduced set of 10 statements

COMP => INTE	**INTE => COMP**
Se uno studente è competente allora è intelligente.	Se uno studente è intelligente allora è competente.
Se uno studente appare competente allora appare intelligente.	Se uno studente appare intelligente allora appare competente.
Se uno studente appare competente allora dimostra intelligenza.	Se uno studente appare intelligente allora dimostra competenza.
Se uno studente dimostra competenza allora appare intelligente.	Se uno studente dimostra intelligenza allora appare competente.
Se uno studente dimostra competenza allora dimostra intelligenza.	Se uno studente dimostra intelligenza allora dimostra competenza.

Table 31 – Rotated Factor Matrix and descriptive statistics for each item;
For each variable, missing values are replaced with the variable mean

ID	Item	Factor 1	Factor 2	Factor 3	Factor 4	Mean	SD
1	Se una persona dimostra competenze allora appare intelligente.	**,811**	,037	,238	-,112	3,97	1,66
2	Se una persona dimostra competenza allora appare intelligente.	**,723**	,137	,268	-,167	3,97	1,62
3	Se una persona appare competente allora appare intelligente.	**,696**	,067	,108	,008	3,61	1,66
4	Se una persona dimostra competenze allora dimostra intelligenza.	**,695**	,427	,127	,081	3,14	1,44
5	Se una persona dimostra competenze allora dimostra intelligenze.	**,634**	,383	,128	,173	3,10	1,42
6	Se una persona appare competente allora dimostra intelligenza.	**,607**	,261	,035	,420	2,82	1,29
7	Se una persona dimostra competenza allora dimostra intelligenza.	**,604**	,347	,087	,203	3,00	1,43
8	Se una persona dimostra intelligenze allora appare competente.*	**,596**	,354	,205	-,195	3,67	1,63
9	Se una persona dimostra competenza allora dimostra intelligenze.	**,589**	,381	,148	,132	3,08	1,45
10	Se una persona dimostra competenze allora è intelligente.	**,588**	,353	,173	,049	2,95	1,36
11	Se una persona dimostra competenza allora è intelligente.	**,562**	,365	,080	,183	2,95	1,35
12	Se una persona appare competente allora dimostra intelligenze.	**,550**	,157	-,005	,423	2,75	1,34
13	Se una persona è competente allora dimostra intelligenze.	**,510**	,329	,154	,136	3,33	1,49
14	Se una persona è competente allora è intelligente.	**,503**	,237	,093	,165	3,12	1,43
15	Se una persona appare competente allora è intelligente.	**,498**	,271	-,014	,429	2,37	1,29
16	Se una persona appare intelligente allora appare competente.*	**,494**	,316	,135	-,056	3,42	1,53
17	Se una persona è competente allora dimostra intelligenza.	**,478**	,379	,127	,090	3,26	1,40
18	Se una persona è competente allora appare intelligente.	**,423**	,116	,382	-,075	4,10	1,65
19	Se una persona dimostra intelligenza allora dimostra competenza.	,316	**,791**	,038	,056	2,77	1,42
20	Se una persona dimostra intelligenza allora è competente.	,198	**,739**	,036	,177	2,62	1,26
21	Se una persona è intelligente allora dimostra competenza.	,283	**,697**	,118	,098	2,85	1,42
22	Se una persona dimostra intelligenza allora dimostra competenze.	,359	**,680**	,135	,001	2,98	1,44
23	Se una persona è intelligente allora è competente.	,298	**,656**	,110	,170	2,71	1,37
24	Se una persona è intelligente allora dimostra competenze.	,289	**,643**	,137	,133	3,10	1,34
25	Se una persona dimostra intelligenze allora dimostra competenza.	,338	**,613**	,120	,106	2,85	1,31
26	Se una persona dimostra intelligenze allora è competente.	,370	**,582**	,087	,127	2,81	1,37
27	Se una persona è intelligente allora appare competente.	,366	**,566**	,180	-,005	3,09	1,39
28	Se una persona appare intelligente allora dimostra competenza.	,396	**,546**	-,010	,443	2,66	1,28
29	Se una persona dimostra intelligenza allora appare competente.	,466	**,536**	,042	-,117	3,51	1,65
30	Se una persona appare intelligente allora è competente.	,314	**,534**	-,075	,465	2,41	1,22
31	Se una persona dimostra intelligenze allora dimostra competenze.	,415	**,460**	,121	,103	3,03	1,35
32	Se una persona appare intelligente allora dimostra competenze.	,427	**,452**	-,046	,409	2,76	1,27
33	Se una persona è intelligente allora dimostra intelligenza.	,028	**,449**	,421	,211	4,17	1,77
34	Se una persona dimostra competenze allora dimostra competenza.	,102	,032	**,747**	,108	5,23	1,53
35	Se una persona dimostra competenze allora appare competente.	,240	-,178	**,732**	,100	5,35	1,46
36	Se una persona dimostra intelligenza allora appare intelligente.	,125	-,064	**,732**	,078	5,41	1,36
37	Se una persona dimostra competenza allora appare competente.	,204	-,082	**,728**	,104	5,50	1,45
38	Se una persona dimostra intelligenze allora dimostra intelligenza.	,114	,008	**,707**	,150	5,03	1,69
39	Se una persona dimostra intelligenze allora appare intelligente.	,166	-,119	**,657**	,081	5,23	1,56
40	Se una persona è competente allora dimostra competenza.	-,017	,208	**,638**	,101	5,21	1,69
41	Se una persona è competente allora dimostra competenze.	,097	,199	**,636**	,017	4,99	1,66
42	Se una persona dimostra competenza allora dimostra competenze.	,166	,057	**,603**	,216	4,71	1,76
43	Se una persona dimostra competenze allora è competente.	-,024	,197	**,582**	,072	4,67	1,82
44	Se una persona dimostra intelligenze allora è intelligente.	,055	,106	**,569**	,094	4,40	1,80
45	Se una persona dimostra competenza allora è competente.	,151	,146	**,565**	,077	5,01	1,53
46	Se una persona dimostra intelligenza allora dimostra intelligenze.	,068	,245	**,533**	,245	4,27	1,79
47	Se una persona è competente allora appare competente.	,136	,267	**,515**	,124	4,46	1,84
48	Se una persona è intelligente allora appare intelligente.	,060	,453	**,468**	,150	3,74	1,68
49	Se una persona dimostra intelligenza allora è intelligente.	,056	,217	**,465**	,359	4,42	1,77
50	Se una persona è intelligente allora dimostra intelligenze.	,133	,431	**,442**	,212	3,72	1,54
51	Se una persona appare intelligente allora dimostra intelligenza.	,084	,133	,211	**,785**	3,51	1,66
52	Se una persona appare intelligente allora dimostra intelligenze.	,147	,077	,275	**,719**	3,40	1,53
53	Se una persona appare competente allora dimostra competenza.	,005	,041	,342	**,673**	3,98	1,70
54	Se una persona appare intelligente allora è intelligente.	-,069	,178	,236	**,643**	2,92	1,63
55	Se una persona appare competente allora dimostra competenze.	,080	-,069	,293	**,612**	3,90	1,73
56	Se una persona appare competente allora è competente.	-,090	,261	,265	**,503**	3,18	1,64
	% of Variance	15,039	14,264	13,734	8,253	Tot	51,290

Table 32 - Pearsons correlation (p < ,05) among singular and plural versions of the same items.

			Se una persona appare competente allora dimostra intelligenza.	Se una persona appare intelligente allora dimostra competenza.	Se una persona è competente allora dimostra intelligenza.	Se una persona è intelligente allora dimostra competenza.
			S-P	S-P	S-P	S-P
			S	S	S	S
Se una persona appare competente allora dimostra intelligenze.	S-P	P	**,653**	,502	,414	,296
Se una persona appare intelligente allora dimostra competenze.	S-P	P	,592	**,664**	,391	,442
Se una persona è competente allora dimostra intelligenze.	S-P	P	,395	,413	**,629**	,428
Se una persona è intelligente allora dimostra competenze.	S-P	P	,469	,502	,369	**,669**

			Se una persona dimostra competenza allora appare intelligente.	Se una persona dimostra competenza allora è intelligente.	Se una persona dimostra intelligenza allora appare competente.	Se una persona dimostra intelligenza allora è competente.
			S	S	S	S
			S-P	S-P	S-P	S-P
Se una persona dimostra competenze allora appare intelligente.	P	S-P	**,678**	,421	,369	,183
Se una persona dimostra competenze allora è intelligente.	P	S-P	,440	**,503**	,438	,402
Se una persona dimostra intelligenze allora appare competente.	P	S-P	,568	,375	**,526**	,333
Se una persona dimostra intelligenze allora è competente.	P	S-P	,259	,431	,420	**,601**

			Se una persona dimostra competenza allora dimostra intelligenza.	Se una persona dimostra intelligenza allora dimostra competenza.
			S	S
			S	S
Se una persona dimostra competenza allora dimostra intelligenze.	S	P	**,646**	,482
Se una persona dimostra intelligenza allora dimostra competenze.	S	P	,414	**,768**

			Se una persona dimostra competenza allora dimostra intelligenza.	Se una persona dimostra intelligenza allora dimostra competenza.
			S	S
			S	S
Se una persona dimostra competenze allora dimostra intelligenza.	P	S	**,572**	,553
Se una persona dimostra intelligenze allora dimostra competenza.	P	S	,474	**,633**

			Se una persona dimostra competenza allora dimostra intelligenze.	Se una persona dimostra intelligenza allora dimostra competenze.
			S	S
			P	P
Se una persona dimostra competenze allora dimostra intelligenze.	P	P	**,609**	,430
Se una persona dimostra intelligenze allora dimostra competenze.	P	P	,358	**,450**

			Se una persona dimostra competenze allora dimostra intelligenza.	Se una persona dimostra intelligenze allora dimostra competenza.
			P	P
			S	S
Se una persona dimostra competenze allora dimostra intelligenze.	P	P	**,729**	,513
Se una persona dimostra intelligenze allora dimostra competenze.	P	P	,543	**,630**

Study IV.c - Competence-intelligence relation organizing principles: core model confirmation

Method

In order to test the factorial validity of the newly created 10 statements set, we included it in a master thesis research project[1] as one of the questionnaires administered (each statement have been associated to a 7 levels Likert scale; 1: strongly disagree; 7:strongly agree). The aim of the research was to study the mediation effect of grade levels obtained by students in their 8th grade exam (in Italian it is named "*esame di terza media*") on the effect of cultural capital level (Bourdieu, 1983/1986; Preteur & Viail, 1997) on subsequent school choice between a scientific high-school and a professional institute.

The study involved a total of 435 participants: 189 students from an Italian "Professional Institute for Hospitality and Catering, Commercial and Tourist" (37.0% males and 63.0% females), and 246 students from an italian "High School - Scientific - Scientific for Applied Sciences "(35.8% males and 64.2% females), aged from 13 to 22.

First order confirmatory factor analysis (2001, Byrne) has been carried out using *Amos 5* software (Arbuckle, 2003). We tested two models: the first one (the strict model) reproducing exactly the factor structure we theoretically ascribed to the set of items; the second one (the optimized model) replies the same structure of the former model, except for the addition of two covariance connections between error terms inside the INTE-COMP factor and three covariance connections in the COMP-INTE factor.

*Table 34 – Most common CFA good fit indicator's thresholds (*Hu & Bentler 1999*)*

Parameter acronym	Good fit threshold	Strict Model, Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	5,779	3,406	Chi square on degree of freedm
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,899	,949	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,923	,967	Comparative fit index
GFI	*> ,95*	,910	,958	Goodness of fit index
AGFI	*> .8*	,854	,921	Adjusted Goodness of fit index
SRMR	*< ,09*	,051	,038	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,105	,074	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,006	Test of close fit

[1] De Vecchi, C. (2012). Cultura, dinamiche sociali e rappresentazioni:Due percorsi formativi a confronto (Unpublished master's thesis). Università di Bologna, Campus di Cesena: Bologna

Figure 3 – Optimized confirmatory factor model

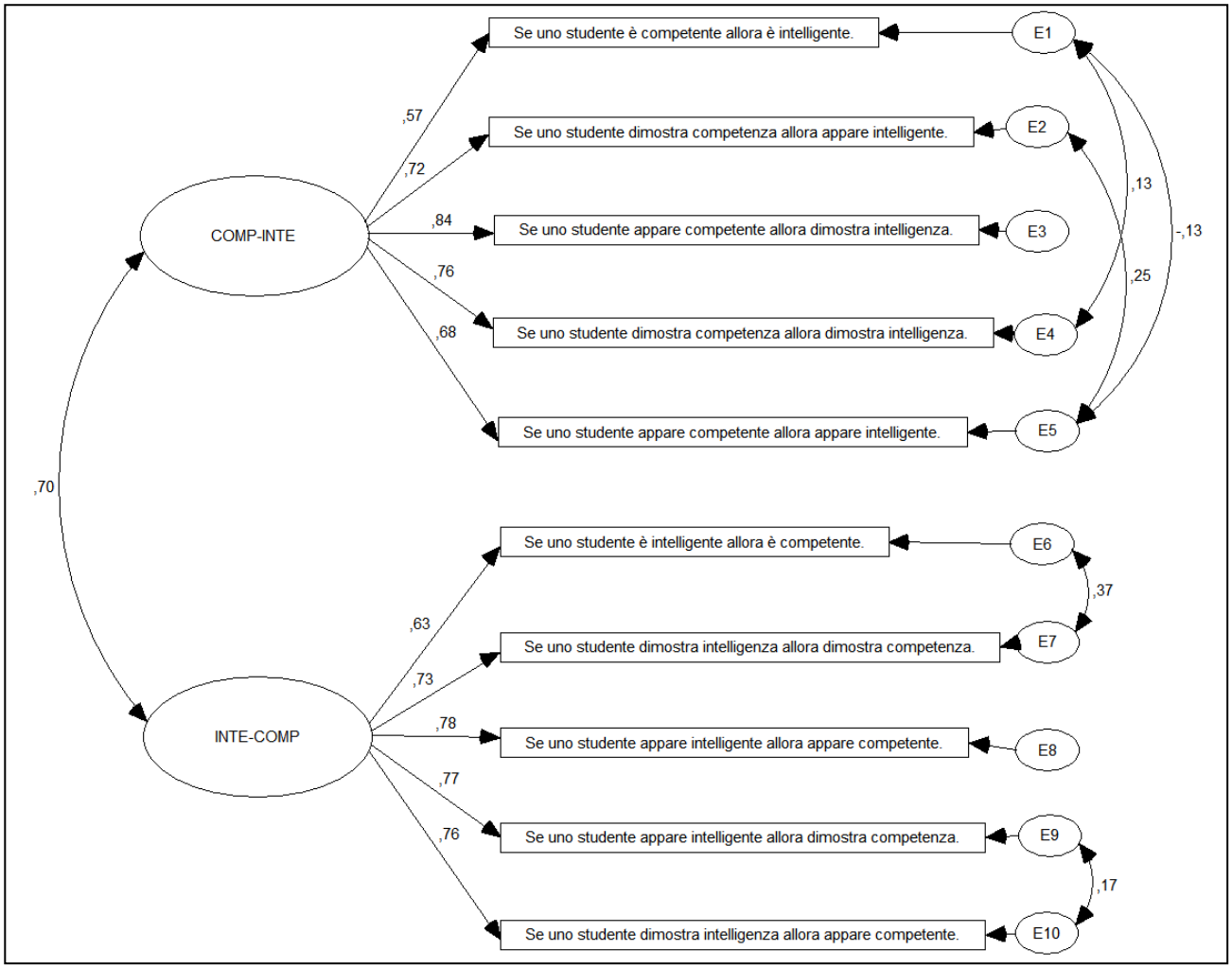


Table 35 – Rotated Factor Matrix, mean, standard deviation and total variance explained for REL INTE-COM,

	COMP=> INTE	**INTE => COMP**	**Mean**	**SD**
Se uno studente appare competente allora dimostra intelligenza.	**,800**	,238	3,98	1,796
Se uno studente dimostra competenza allora appare intelligente.	**,708**	,235	4,34	1,850
Se uno studente dimostra competenza allora dimostra intelligenza.	**,704**	,260	4,05	1,847
Se uno studente appare competente allora appare intelligente.	**,676**	,218	4,21	1,798
Se uno studente è competente allora è intelligente.	**,498**	,233	3,54	1,969
Se uno studente è intelligente allora è competente.	,092	**,770**	4,11	2,079
Se uno studente dimostra intelligenza allora dimostra competenza.	,260	**,763**	3,79	2,005
Se uno studente appare intelligente allora appare competente.	,358	**,662**	3,83	1,920
Se uno studente appare intelligente allora dimostra competenza.	,384	**,648**	3,91	1,830
Se uno studente dimostra intelligenza allora appare competente.	,396	**,633**	4,25	1,860
% of variance	28,512	27,15	**Total**	55,661

Results

The strict model tested shows good fit only as regards to CFI and AGFI and SRMR parameters. The optimized model shows significant improvements in all parameters except for PCLOSE and p-value (Table 34).

To further corroborate the correctness of the two factor structure we performed a maximum likelihood factor analysis (factor extraction: eigenvalue >1) with varimax orthogonal rotation, and a reliability analysis using SPSS 19.

Table 36 - Reliability Statistics and Descriptive statistics

Factor	Cronbach's Alpha	N of Items	Mean	Std. Deviation
INTE => COMP	,868	5	4,0184	1,459
COMP=> INTE	,839	5	3,9862	1,597

We tested internal consistency of each factor through reliability analysis.

To evaluate the results we will refer to George and Mallery (2003) reference thresholds scheme: Alpha > .9 – Excellent, > .8 – Good, > .7 – Acceptable, > .6 – Questionable, > .5 – Poor, < .5 – Unacceptable (p. 231). According to this reference the level of internal consistency of factors can be considered at least good.

Discussion

Both confirmatory factor analysis and exploratory factor analysis corroborate the hypothesis that the scale we built is consistent with the theorized two factors latent structure. This result, in combination with the logical structure described earlier (cf. table 35), gives us the possibility to identify and measure the different styles characterizing the ways students combine features related to competence and/or intelligence without investigating any representations content.

CHAPTER III - Students, Competence and intelligence principles: the role of Cultural capital

Introduction

In Chapter I we selected 70 statements representing the position-taking principles used by students to judge other students competence (n=42) and intelligence (n=28). In Chapter II we selected 10 statements representing the position-taking principles used by students to judge competence and intelligence through their perception of competence-intelligence (n=5) and intelligence-competence (n=5) relation.

Starting from these outputs the main goals of this chapter can be stated as follows:

1) *Study V*: extracting from position-taking principles of competence and intelligence (output of Chapter I, and II) their underlying organizing principles.
2) *Study VI*: understanding the link connecting students cultural capital level (defining their position within the social field), their positions on the identified organizing principles (output of Study 5), and their early school achievements (8th grade exam score, high school math and Italian grades)

The studies we implemented in this chapter are conceptually compatible with the second and third step of the "three phases model" (cf. Chapter I; Doise, Clémence & Lorenzi-Cioldi, 1992): Study V corresponds to phase 2 and Study VI corresponds to phase 3.

Study V.a - Competence and intelligence organizing principles: testing the handmade model

The goal of this study is to test if the semantic structure emerged from study IV (cf. Table 28, Chapter I) corresponds to the organizing principles.

Method

Sample

The model we tested (Figure 4) is based on a selection of 6 out of 10 dimensions emerged from the manual content analysis (cf. Chapter I, Study III). We excluded from the analysis all those dimensions containing less than one statement.

In order to test our model we built a questionnaire and administered it to a large and differentiated sample of persons recruited inside the social group of university students. To ensure both an adequate sample differentiation and size we administered the questionnaire employing multiple strategies: direct contact combined with paper and pencil questionnaire administration for psychology students (n=56), advertising through official mailing list associated with a web questionnaire administration (n=406), the latter strategy has been adopted for architecture, computer science and engineering students , and finally for a group via Facebook with, once again, a web questionnaire administration (n=267).

Procedure

The questionnaire used for this study consists of the following sections:

- Social and demographic information.
- Position taking principles for competence and intelligence (n=70; cf. Table 29, Chapter I).

- Position taking principles for the relation between competence and intelligence (n=10; cf. Table 33, Chapter II).

We built two different counterbalanced versions of the questionnaire that have been randomly assigned to participants. For each of them we created two more versions replacing the word "student" with the word "person". We opted for this solution because we wanted to take into account also the variability introduced by changing the insertion target. Before its administration the questionnaire has been approved by the University of Bologna's Ethics Committee of the Department of Psychology.

Results

We collected a total of 729 responses to our questionnaire, 491 were complete (m=227; f= 263; age M= 21,52 SD=3,74), 141 were only partially filled, and 97 were empty (cf. Table 37). We discarded all the questionnaires that were not complete.

The birth-family origin of participants spreads on 76 different provinces with a high prevalence of Ravenna, Rimini, Forlì-Cesena, and Bologna (cf. Table 38).

As for the faculty of the participants, we registered a neat prevalence of Psychology students (30.3%) and Engineering students (29.3%; cf. Table 39).

Table 37– Different origins of the collected questionnaires.

Collection strategy	Fully completed	Partially completed	Empty	Total
Direct	56	*0*	*0*	*56*
Mailing list	293	74	39	406
Facebook	142	67	58	267
Total	491	141	97	729

Table 38 – Geographical origin of participants family frequency table

Prov.	Freq.	%	Prov.	Freq.	%	Prov.	Freq.	%	Prov.	Freq.	%	Prov.	Freq.	%
AG	1	,2	**CE**	2	,4	**KR**	2	,4	**PD**	1	,2	**SA**	9	1,8
AN	15	3,1	**CH**	4	,8	**LE**	7	1,4	**PE**	1	,2	**SP**	2	,4
AP	3	,6	**CL**	1	,2	**LT**	2	,4	**PG**	5	1	**SR**	1	,2
AQ	2	,4	**CO**	2	,4	**LU**	4	,8	**PR**	1	,2	**SS**	1	,2
AR	1	,2	**CR**	1	,2	**MB**	2	,4	**PT**	1	,2	**SV**	2	,4
AV	3	,6	**CS**	3	,6	**MC**	6	1,2	**PU**	14	2,9	**TA**	3	,6
BA	9	1,8	**CT**	4	,8	**ME**	2	,4	**PV**	1	,2	**TE**	2	,4
BG	1	,2	**CZ**	5	1	**MI**	2	,4	**PZ**	3	,6	**TO**	2	,4
BI	1	,2	**FC**	106	21,6	**MO**	6	1,2	**RA**	42	8,6	**TP**	2	,4
BN	2	,4	**FE**	2	,4	**MT**	1	,2	**RC**	4	,8	**TR**	2	,4
BO	48	9,8	**FG**	10	2	**NA**	11	2,2	**RE**	9	1,8	**TV**	3	,6
BR	3	,6	**FI**	5	1	**OG**	1	,2	**RG**	1	,2	**VA**	2	,4
BT	1	,2	**FM**	1	,2	**OR**	3	,6	**RM**	12	2,4	**VB**	2	,4
BZ	1	,2	**FR**	2	,4	**PA**	5	1	**RN**	45	9,2	**VI**	3	,6
CA	5	1	**GE**	3	,6	**PC**	1	,2	**RO**	2	,4	**VR**	2	,4
FGN	6	1,2										**VV**	2	,4
Total	490	99,8	**Missing**	1	,2	**Total**	491	100						

Table 39 – Participants studies frequencies table

Faculty	Frequency	%
Architecture	33	6,7
Psychology	149	30,3
computer sciences	39	7,9
Engineering	144	29,3
Law	5	1,0
Other faculty unspecified	70	14,3
does not study at university	47	9,6
Total with no missing	487	99,2
Missing	4	,8
Total	491	100,0

Figure 4 –Optimized confirmatory factor model

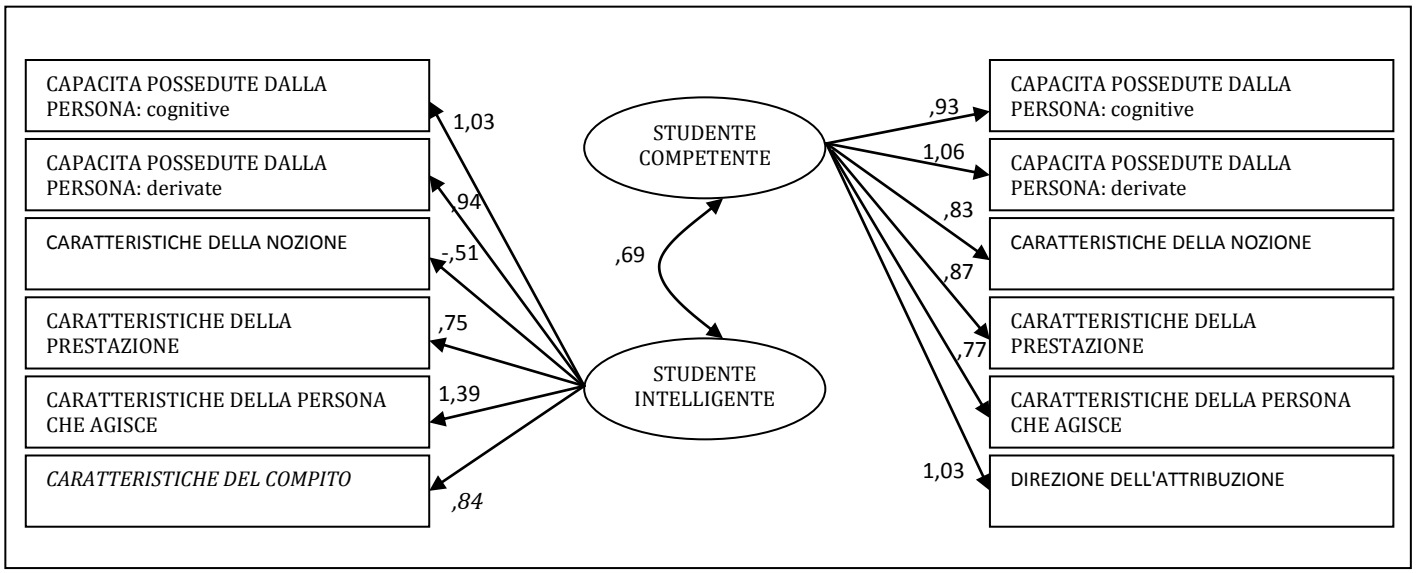


Table 40– Most common CFA good fit indicator's thresholds (Hu & Bentler 1999)

Parameter acronym	**Good fit Threshold**	**Strict Model Parameter values**	**Optimized Model Parameter values**	**Parameter description**
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	2,578	2,714	Chi square on degree of freedm
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,575	,710	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 Sometimes permissible*	,590	,738	Comparative fit index
GFI	*> ,95*	,679	,801	Goodness of fit index
AGFI	*> .8*	,658	,768	Adjusted Goodness of fit index
SRMR	*< ,09*	,079	,070	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,057	,059	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,000	Test of close fit

To test the model (cf. Figure 4) we carried out a second order confirmatory factor analysis using AMOS 5 (Arbuckle, 2003).

The model we tested shows a good fit as regards to RMSES and SRMR parameters but not for the others. We modified the original model introducing covariances between error terms members of the same latent factor, according to the model modification index table. The derived optimized model shows improvements in TLI, CFI, GFI and AGFI parameters although they still remain below the minimum suggested good fit thresholds (cf. Table 40).

Study V.b - Competence and intelligence organizing principles: exploration and core model extraction

In the previous study the model we tested showed an unacceptable fit in terms of parameter and thresholds. For this reason, in order to bring out a possibly different latent factor structure revealing the organizing principles of the set of position-taking statements, in this study we first performed an exploratory factor analysis of the previously collected data and then selected among them the most representative organizing principles.

Method

We applied an exploratory factor analysis to the whole 70 items dataset created for the previous study (cf. Study V.a) (SPSS 19; Maximum likelihood extraction algorithm with Varimax rotation; factors extraction strategy set up to eigenvalues greater than 1).

Results

Factor analysis identified 19 different factors (cf. Table 41 and 43) emphasizing the complex articulation of the organizing principles. In order to extract only the core of this structure we defined and implemented a three step selection strategy. In the first step, we considered the extracted factors as a whole, looking for elements authorizing the inclusion or the exclusion of factors. In the second step we move our point of view towards the single statements and their relation with the factor in which they are included in order to exclude those resulting less focused on the core content of the factor. In the third step we combine the local (focus on the items) and global (focus on the factors) point of view to fine tune the final output.

In the first step we applied the following rules:

- retain only those factors containing at least two items (this excludes factors numbered from 14 to 19).
- since the remaining factors can be partitioned in two groups, one containing items related to competence and intelligence attributions (1, 3, 4, 6, 7, 8, 11), the other containing more definitional statements (2, 5, 9, 10, 12,13) and having decided to focus on the effects of the former group, excluded the latter.

The output of the first selection step is a 35 statements, partitioned in 7 factors, set.

In the second step we focused on items correlation score within each factor. The rules we applied are the following (cf. in Table 41, statements preceded by an asterisk):

- items 8, 28, 32, 33, 34, 35, 36, 37, 47, 48: because their score is below the cutoff level of ,42 (it corresponds to the score beyond which it remains an acceptably small number of items).
- items 31: because this item is a specification of item 37 that have been yet discarded.

In the third and last step we decided upon keeping (cf. in Table 41, statements with two asterisks) even if formally violating some of the rules previously defined:

- items 26, 27,: because they are members of a small factor and theirs scores is however greater than ,4
- item 60: because we need to increase the size of the potentially weakest factor.

We decided also to eliminate (cf. in Table 41, statements with three asterisks) items 51, 52 to balance the number of statements between competence and intelligence

Table 41.a – Statements surviving the first selection stage

Factor ID	Item ID	Type	*Uno studente competente …*
1	01	COMP	svolge il suo dovere con costanza
	02	COMP	possiede la costanza necessaria a portare a termine ciò che comincia
	03	COMP	mostra di sapersi gestire
	04	COMP	svolge il suo dovere rispettando i tempi
	05	COMP	comprende ciò che gli viene chiesto e agisce di conseguenza
	06	COMP	si comporta in modo appropriato nel contesto sociale
	07	COMP	si esprime correttamente
	08	COMP	*ragiona in modo completo in ogni circostanza
3	23	COMP	analizza la situazione in cui si trova
	24	COMP	fa collegamenti tra le conoscenze acquisite
	25	COMP	controlla se sta facendo bene ciò che vuole fare
	26	COMP	**applica in modo efficace le conoscenze alla pratica
	27	COMP	**sviluppa proprie idee su ciò che apprendere.
	28	COMP	*acquisisce nuove conoscenze e capacità
8	51	COMP	***costruisce collegamenti tra le azioni che compie
	52	COMP	***identifica ciò che serve per padroneggiare la situazione in cui si trova
4	29	INTE	ha facilità nella memorizzazione
	30	INTE	ricorda ciò che ha imparato, anche a distanza di tempo
	31	INTE	*raggiunge i propri obiettivi, se possiede intelligenza pratica
	32	INTE	*riesce a scuola
	33	INTE	*dimostra di possedere le abilità proprie della cultura in cui vive
	34	COMP	*possiede una elevata autostima
	35	INTE	*ottiene risultati eccellenti in alcuni ambiti specifici e riesce bene anche in molti altri ambiti
	36	COMP	*possiede capacità intellettive generali
	37	COMP	*raggiunge i propri obiettivi
6	44	INTE	capisce al volo le cose
	45	INTE	coglie velocemente collegamenti tra pensieri, anche difficili
	46	INTE	non fatica nel ragionamento
	47	COMP	*offre una prestazione eccellente
	48	COMP	*si riconosce quando lavora
7	49	INTE	crea collegamenti tra le cose che sa
	50	INTE	comprende molte cose, anche in ambiti in cui non è competente
11	58	INTE	gestisce in modo ottimale i tempi
	59	INTE	organizza le sue priorità per ottenere il risultato migliore possibile
	60	INTE	**pensa al suo futuro

Table 42 – Items grouped by extracted factors.

Factor ID	Item ID	Type	Item
1	1	COMP	Uno studente competente svolge il suo dovere con costanza
	2	COMP	Uno studente competente possiede la costanza necessaria a portare a termine ciò che comincia
	3	COMP	Uno studente competente mostra di sapersi gestire
	4	COMP	Uno studente competente svolge il suo dovere rispettando i tempi
	5	COMP	Uno studente competente comprende ciò che gli viene chiesto e agisce di conseguenza
	6	COMP	Uno studente competente si comporta in modo appropriato nel contesto sociale
	7	COMP	Uno studente competente si esprime correttamente
	8	COMP	Uno studente competente ragiona in modo completo in ogni circostanza
2	9	COMP	Le competenze sono insiemi di capacità che permettono di ottenere buone prestazioni in un ambito specifico
	10	COMP	Uno studente competente può imparare.
	11	INTE	La familiarità con un compito incide sul risultato
	12	COMP	La competenza è una caratteristica che si sviluppa
	13	COMP	La competenza può essere acquisita in seguito all'impegno
	14	COMP	La competenza è la capacità di padroneggiare le caratteristiche di uno specifico contesto
	15	COMP	Uno studente competente ritiene che le risorse personali di cui dispone sono sufficienti a produrre la prestazione che desidera
	16	COMP	La qualità della prestazione dipende dalla situazione in cui la competenza si esprime
	17	COMP	Le competenze influiscono sulle possibilità che ha nella vita
	18	INTE	Uno studente intelligente è dotato di capacità di rielaborazione delle conoscenze che apprende
	19	COMP	La competenza di uno studente dipende strettamente dall'ambito in cui si manifesta
	20	COMP	Competenza è sinonimo di "saper fare"
	21	COMP	Uno studente competente usa le abilità che possiede
	22	COMP	La competenza diventa parte del concetto di sé
3	23	COMP	Uno studente competente analizza la situazione in cui si trova
	24	COMP	Uno studente competente fa collegamenti tra le conoscenze acquisite
	25	COMP	Uno studente competente controlla se sta facendo bene ciò che vuole fare
	26	COMP	Uno studente competente di applica in modo efficace le conoscenze alla pratica
	27	COMP	Uno studente competente sviluppa proprie idee su ciò che apprendere.
	28	COMP	Esiste una competenza generale grazie alla quale ogni studente può acquisire nuove conoscenze e capacità
4	29	INTE	Uno studente intelligente ha facilità nella memorizzazione
	30	INTE	Uno studente intelligente ricorda ciò che ha imparato a distanza di tempo
	31	INTE	Uno studente intelligente possiede intelligenza pratica per riuscire a raggiungere i propri obiettivi
	32	INTE	Uno studente intelligente riesce a scuola
	33	INTE	Uno studente intelligente possiede le abilità proprie della cultura in cui vive
	34	COMP	Uno studente competente possiede una elevata autostima
	35	INTE	Uno studente intelligente ottiene risultati eccellenti in alcuni ambiti e riesce bene in molti altri
	36	COMP	La competenza di uno studente dipende dalle sue capacità intellettive generali
	37	COMP	Uno studente competente raggiunge i propri obiettivi
5	38	INTE	L'intelligenza si può misurare utilizzando appositi test
	39	INTE	Uno studente intelligente possiede un quoziente intellettivo (QI) alto
	40	INTE	La scienza è riuscita a spiegare che cos'è l'intelligenza
	41	INTE	Il livello di intelligenza di uno studente dipende dalle caratteristiche fisiologiche del suo cervello
	42	INTE	Alcuni studenti sono più intelligenti, altre lo sono meno
	43	COMP	La competenza di uno studente può essere misurata utilizzando specifici test
6	44	INTE	Uno studente intelligente capisce al volo le cose
	45	INTE	Uno studente intelligente coglie velocemente collegamenti tra pensieri, anche difficili
	46	INTE	Uno studente intelligente non fatica nel ragionamento
	47	COMP	Uno studente competente offre una prestazione eccellente
	48	COMP	La competenza di uno studente si vede quando lavora
7	49	INTE	Uno studente intelligente crea collegamenti tra le cose che sa
	50	INTE	Uno studente intelligente comprende molte cose in ambiti cui non è competente
8	51	COMP	Uno studente competente costruisce collegamenti tra le azioni che compie
	52	COMP	Uno studente competente identifica ciò che gli serve per padroneggiare la situazione in cui si trova
9	53	INTE	I test per misurare l'intelligenza si limitano a prendere in considerazione solo pochi tipi di intelligenza
	54	INTE	L'intelligenza non è una sola, ma ne esistono diverse
	55	INTE	Uno studente che possiede intelligenza pratica non è necessariamente bravo a scuola
10	56	COMP	Ogni studente fa in modo di evitare di sentirsi incompetente
	57	COMP	Ogni studente ha un bisogno innato di sentirsi competente
11	58	INTE	Uno studente intelligente gestisce in modo ottimale i tempi
	59	INTE	Uno studente intelligente organizza le sue priorità per ottenere il risultato migliore possibile
	60	INTE	Uno studente intelligente pensa al suo futuro
12	61	COMP	La definizione delle competenze dipende da ciò che la società valorizza
	62	INTE	Tutte le abilità intellettive possedute dagli studenti hanno un'origine sociale
13	63	INTE	L'intelligenza è una caratteristica che si sviluppa con l'età
	64	COMP	Quando si misura la competenza si deve tener conto del fatto che lo studente può imparare
14	65	INTE	Uno studente intelligente è critico
15	66	COMP	Uno studente è competente se riesce a raggiungere gli obiettivi definiti da qualcun altro
16	67	COMP	La competenza di uno studente dipende da un insieme di capacità innate
17	68	COMP	Uno studente competente conosce il modo di dare soluzione a problemi
18	69	COMP	Uno studente competente riesce a portare a termine un compito
19	70	INTE	Uno studente intelligente ha successo grazie alla capacità di dimostrare competenze che in realtà non possiede

Tabella 43 – Rotated factor matrix parameters.

Factor ID	Item ID	Factors																			Mean	SD
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
1	1	**,758**	,008	-,017	,062	,045	,056	,004	,110	-,044	,054	,063	-,070	,088	,042	-,023	,081	-,026	,077	,009	4,37	1,606
	2	**,698**	,067	,183	,145	,032	,051	,032	-,007	-,046	,061	,065	-,004	-,006	,066	,022	,081	-,089	,070	,051	4,45	1,584
	3	**,632**	,150	,271	,196	-,039	,042	-,012	,043	-,081	,072	,022	,069	-,010	,029	,059	,003	,033	-,150	-,007	4,88	1,448
	4	**,543**	,074	,063	,102	,106	,038	,065	,131	,078	,012	,133	,018	,067	-,141	,020	-,106	,039	,063	-,139	4,96	1,494
	5	**,470**	,197	,417	-,018	,050	,180	,189	,071	-,044	,105	,133	,047	,037	-,058	,178	,023	,110	-,019	-,022	5,16	1,361
	6	**,447**	,010	,223	,188	,032	-,004	-,063	,153	-,058	,020	,107	,190	,081	,084	,000	,127	,267	-,049	,136	4,10	1,618
	7	**,434**	,076	,132	,328	-,044	,142	-,070	,061	,088	-,019	,008	-,044	,110	,161	,064	,009	-,005	-,080	,036	4,19	1,668
	8	**,417**	-,143	,218	,138	,031	,127	,023	,348	-,062	,075	,084	,039	,182	,024	,057	,032	,114	-,098	-,069	3,84	1,698
2	9	,051	**,568**	,116	-,024	,031	,082	,039	,107	-,034	-,034	,104	,018	-,052	-,119	,126	,319	-,070	,120	-,068	5,89	1,039
	10	,031	**,566**	,079	-,086	-,001	-,003	-,002	,026	,024	,028	,004	,020	,019	-,019	-,130	-,176	,009	-,078	-,054	6,24	,972
	11	,020	**,541**	,101	,130	,001	,112	,032	-,045	,047	,104	,061	,071	-,049	,231	,059	,025	-,069	,075	,027	5,93	1,245
	12	,072	**,519**	,047	-,074	,055	,050	,038	,026	,118	,035	,011	,029	,102	,029	-,065	-,062	,064	-,033	-,002	5,93	1,168
	13	,095	**,488**	,082	-,084	-,094	,050	,122	,015	,127	,086	-,004	-,065	,174	-,005	,051	-,158	-,052	-,024	,065	6,01	1,038
	14	,028	**,450**	,043	,102	,118	,075	-,012	,022	,046	,020	,024	-,159	-,075	,079	,072	,012	-,054	-,031	-,016	5,54	1,311
	15	,113	**,389**	-,038	,130	,051	,029	,106	,033	,000	,167	-,081	,160	-,006	,041	,038	,003	,012	-,037	,042	5,19	1,483
	16	-,072	**,388**	,220	,033	-,028	-,003	,121	-,017	,156	,016	,039	,158	,016	,022	,077	,108	,150	,083	,020	5,22	1,288
	17	,072	**,385**	,240	,059	,025	,097	,073	,043	,048	-,020	,033	-,063	,160	-,078	-,128	,105	,174	,046	,042	5,71	1,222
	18	,095	**,385**	,068	,096	,045	,200	,250	,108	-,041	-,007	,056	,020	-,017	,371	-,018	,043	,031	-,033	,015	5,73	1,264
	19	-,033	**,380**	-,054	,006	,049	,284	,111	-,115	,162	,003	,020	,184	-,039	-,008	,028	,004	,041	,074	,035	4,91	1,660
	20	,051	**,342**	,068	,142	,167	,268	,086	-,035	-,036	,074	,052	-,020	,075	-,100	,158	,092	,078	,211	-,109	5,25	1,423
	21	,261	**,318**	,272	-,003	-,091	-,057	-,038	,132	-,064	,033	,069	,027	-,009	,059	,137	,295	,058	-,066	,015	5,57	1,305
	22	,065	**,271**	,255	,149	,106	-,058	,047	,076	,138	,070	-,013	,053	-,040	,169	,017	-,046	,253	,070	-,179	5,02	1,342
3	23	,395	,087	**,659**	,091	-,053	,009	,035	,083	,040	,075	,047	-,138	-,013	,049	-,001	-,076	,152	,141	,222	5,02	1,308
	24	,120	,075	**,638**	,087	-,010	-,140	-,058	,074	,072	,066	,085	,045	,050	,043	-,001	-,021	-,083	,017	-,008	5,25	1,417
	25	,270	,242	**,498**	-,005	,073	,220	,155	,083	-,061	-,014	,061	,016	,020	-,013	,061	-,003	,026	,088	-,148	5,44	1,294
	26	,134	,284	**,406**	,107	,034	,129	-,032	,133	,001	-,064	,026	-,029	-,017	,063	-,020	,141	,087	-,139	-,029	5,66	1,303
	27	,193	,082	**,406**	,164	-,022	,022	-,111	,275	,049	,068	,110	,004	,116	,126	-,006	,109	-,034	,026	-,011	4,95	1,569
	28	-,023	,187	**,293**	,135	,048	,012	,121	,083	,159	,145	-,069	,039	,204	,020	-,241	-,066	-,091	-,161	-,066	4,77	1,544
4	29	,157	,051	,119	**,604**	,058	,062	,037	,132	-,071	,106	,052	,017	,003	-,116	-,095	,005	-,005	-,056	,028	3,50	1,615
	30	,124	,061	,055	**,466**	,033	,240	,220	,059	-,124	,105	,150	,081	-,042	-,032	,052	,040	-,221	-,116	-,032	3,90	1,731
	31	,154	,089	-,028	**,439**	,100	,123	-,060	,101	,074	,066	,086	,021	,071	,102	,124	-,072	,149	,088	,038	4,31	1,449
	32	,102	-,027	,063	**,408**	,217	,174	-,023	-,033	-,041	,047	,066	-,052	,149	,038	,013	,035	,012	,068	-,029	2,43	1,456
	33	,102	,002	,090	**,401**	,077	,065	-,013	-,004	,026	-,031	,124	,238	-,009	,098	,119	,040	-,047	-,009	,032	3,34	1,649
	34	,329	,102	-,027	**,400**	,139	,103	-,035	,011	-,047	,078	-,041	,170	-,066	,160	,020	,124	,050	,139	-,014	3,62	1,668
	35	,063	-,026	,126	**,381**	,245	-,005	,272	-,054	-,135	-,074	-,022	,025	,248	,071	,029	,038	,142	,017	,015	3,49	1,615
	36	,123	-,023	,311	**,345**	,106	,118	,122	-,111	,020	-,041	,142	,044	,131	,018	-,005	,133	,114	-,060	-,074	4,01	1,437
	37	,261	-,052	,160	**,333**	,006	,082	,073	,137	-,022	-,051	-,024	,046	,282	-,040	,118	,075	-,001	,105	-,020	3,80	1,705
5	38	,039	,120	,080	,099	**,729**	,086	-,042	,026	-,064	-,022	,034	,197	-,075	-,002	-,049	-,096	-,064	,015	,125	3,17	1,601
	39	,092	,049	-,013	,132	**,664**	,131	,072	-,010	-,131	,027	,001	-,050	,000	-,067	,050	,057	-,011	,058	,057	3,85	1,711
	40	,035	-,014	-,002	,060	**,558**	,018	-,024	,068	-,071	,006	,058	,012	,151	,068	,015	,023	,049	,056	-,242	3,20	1,624
	41	,018	,020	-,018	,127	**,441**	,131	,186	-,072	,231	,011	,044	-,113	,090	,035	,106	,105	,076	-,175	,040	3,28	1,622
	42	-,037	,063	,010	,037	**,409**	,189	,376	,047	,131	,023	,024	-,229	,009	,039	,174	,078	,147	-,089	,044	4,94	1,841
	43	-,023	,275	-,029	,207	**,316**	,126	,044	-,027	-,054	-,132	-,045	,092	-,074	,024	,029	-,171	-,043	-,258	,014	3,97	1,802
6	44	,188	,083	-,041	,152	,185	**,626**	,153	,065	-,032	-,020	,063	,013	,066	,098	,033	,063	,074	-,008	,174	4,31	1,554
	45	,139	,247	,054	,187	,054	**,537**	,293	,130	,015	-,040	,088	-,031	-,088	,081	-,103	-,012	,014	,031	,129	5,27	1,296
	46	,033	,088	,014	,172	,151	**,534**	,030	,008	,030	,095	,028	,025	,018	,092	,031	,010	-,082	-,031	-,159	3,99	1,740
	47	,295	,252	,145	,124	,082	**,359**	,092	,217	-,111	,033	,098	,054	,060	-,040	,157	-,032	,111	,090	-,012	4,92	1,414
	48	,145	,268	,107	,161	,037	**,314**	,090	,010	,022	,020	,100	-,064	,072	,051	,088	-,030	,057	,052	-,004	4,90	1,504
7	49	,092	,289	,012	,012	,049	,200	**,625**	,052	,107	,046	,154	,052	-,023	,182	-,024	-,047	,049	,145	-,090	5,80	1,210
	50	-,017	,245	-,007	,070	,075	,272	**,533**	,031	-,094	,010	,088	,132	,041	,043	,043	,037	-,101	-,079	,086	4,91	1,552
8	51	,287	,086	,207	,170	-,021	,127	,074	**,654**	,041	-,070	-,028	,064	,125	,047	,022	,043	-,002	-,028	,059	5,16	1,382
	52	,378	,133	,274	-,026	,094	,027	,061	**,512**	-,003	,013	,042	,023	-,074	,077	,045	-,024	,056	,053	-,062	5,51	1,265
9	53	,009	,134	-,058	-,055	-,264	,129	-,049	-,024	**,546**	-,024	-,033	,301	,145	,044	,065	-,001	,048	-,150	-,039	5,33	1,604
	54	-,028	,150	,070	-,009	-,068	-,086	-,036	-,003	**,534**	,033	-,005	,109	,014	,021	-,069	,000	-,014	,118	-,007	5,93	1,468
	55	-,092	,188	,063	-,092	,062	,056	,111	,055	**,333**	,094	,026	-,045	-,109	-,067	,077	,022	-,017	-,058	,059	5,76	1,385
10	56	,135	,097	,022	,004	,008	,067	-,040	-,069	,052	**,711**	,053	-,046	,045	,044	-,004	-,010	,016	,025	,008	4,63	1,659
	57	,045	,143	,107	,163	-,010	,002	,079	,062	,028	**,598**	,011	,204	-,005	-,018	-,089	,051	-,010	,010	,007	4,67	1,616
11	58	,284	,011	,076	,277	,017	,099	,072	,157	,021	,032	**,616**	-,015	,019	-,055	-,044	-,017	,057	-,002	-,112	4,17	1,611
	59	,136	,145	,234	,089	,108	,145	,151	-,103	,001	,056	**,567**	-,064	,068	,132	-,007	-,004	-,036	,047	,089	5,16	1,568
	60	,176	,099	,152	,221	,074	,101	,125	,011	-,107	,063	**,331**	-,088	,244	,275	,103	,064	,041	-,025	,198	4,30	1,839
12	61	-,054	,126	,016	,136	-,030	,038	,002	-,078	,142	,037	-,026	**,385**	,070	-,079	,030	,082	-,001	,003	,087	4,53	1,773
	62	,063	-,034	,003	,042	,046	-,004	,051	,104	,055	,064	-,037	**,350**	,037	,104	,041	-,030	,027	,006	-,054	3,44	1,510
13	63	,125	,091	,082	,161	,107	,040	-,015	,050	,010	,066	,077	,102	**,444**	,107	,080	,034	,004	,028	-,028	3,75	1,645
	64	,102	,243	-,033	-,034	-,093	-,070	-,016	,113	,135	-,049	,081	,158	**,252**	-,145	,081	,086	,032	,019	,047	5,43	1,475
14	65	,048	,133	,157	,045	-,009	,234	,185	,093	,027	,029	,079	,133	,128	**,448**	-,014	-,034	,018	-,034	-,001	5,26	1,688
15	66	,203	,090	,047	,185	,147	,094	,065	,078	,036	-,116	-,047	,157	,170	,005	**,600**	,023	,013	,040	,008	3,70	1,626
16	67	,196	-,259	,042	,298	,126	,077	,059	,012	,096	,086	-,074	,092	,209	-,010	-,018	**,479**	-,022	-,009	,013	2,90	1,465
17	68	,327	,232	,356	,039	,076	,232	,027	,112	-,095	,012	,058	,138	,033	-,025	,113	-,042	**,397**	-,016	,031	4,95	1,334
18	69	,335	,110	,130	,198	,077	,208	,056	-,013	,066	,065	,057	,075	,135	-,049	,200	-,061	,008	**,377**	,001	4,33	1,608
19	70	-,063	-,029	-,055	,215	,178	,206	,076	,020	,092	,101	,037	,154	-,035	,065	,056	-,016	,032	,008	**,235**	2,98	1,668
	% of Variance	5,937	5,509	4,037	3,932	3,295	3,219	2,158	1,888	1,653	1,638	1,617	1,455	1,379	1,239	1,207	1,073	,947	,912	,726	Total Var. %	43,821

Table 44 – Competence related final factor structure

Factor ID	Item ID	*Se uno studente è competente …*
1	01	svolge il suo dovere con costanza
	02	possiede la costanza necessaria a portare a termine ciò che comincia
	03	mostra di sapersi gestire
	04	svolge il suo dovere rispettando i tempi
	05	comprende ciò che gli viene chiesto e agisce di conseguenza
	06	si comporta in modo appropriato nel contesto sociale
	07	si esprime correttamente
3	23	analizza la situazione in cui si trova
	24	fa collegamenti tra le conoscenze acquisite
	25	controlla se sta facendo bene ciò che vuole fare
	26	applica in modo efficace le conoscenze alla pratica
	27	sviluppa proprie idee su ciò che apprendere.

Table 45 – Intelligence related final factor structure

Factor ID	Item ID	*Se uno studente è intelligente …*
4	29	ha facilità nella memorizzazione
	30	ricorda ciò che ha imparato, anche a distanza di tempo
6	44	capisce al volo le cose
	45	coglie velocemente collegamenti tra pensieri, anche difficili
	46	non fatica nel ragionamento
7	49	crea collegamenti tra le cose che sa
	50	comprende molte cose, anche in ambiti in cui non è competente
11	58	gestisce in modo ottimale i tempi
	59	organizza le sue priorità per ottenere il risultato migliore possibile
	60	pensa al suo futuro

Table 46 – Competence Rotated Factor Matrix

Item ID	Uno studente competente …	C1	C2
1	svolge il suo dovere con costanza	**,764**	,072
2	possiede la costanza necessaria a portare a termine ciò che comincia	**,723**	,242
3	mostra di sapersi gestire	**,605**	,369
4	svolge il suo dovere rispettando i tempi	**,530**	,152
6	si esprime correttamente	**,469**	,227
5	sa come comportarsi nel contesto sociale	**,463**	,326
7	analizza la situazione in cui si trova	,348	**,660**
8	fa collegamenti tra le conoscenze acquisite	,067	**,640**
9	controlla se sta facendo bene ciò che vuole fare	,256	**,552**
10	comprende ciò che gli viene chiesto e agisce di conseguenza	**,443**	**,522**
12	sviluppa proprie idee su ciò che apprendere.	,210	**,497**
11	applica in modo efficace le conoscenze alla pratica	,128	**,497**
	% of Variance (Total 41,085)	**21,963**	**19,122**

Table 47 – Intelligence Rotated Factor Matrix

Item ID	Uno studente intelligente …	I1	I2	I3
13	coglie velocemente collegamenti e concetti difficili	**,693**	,158	,190
14	capisce al volo le cose	**,627**	,125	,181
15	comprende molte cose in ambiti cui non è competente	**,562**	,166	,040
16	crea collegamenti tra le cose che sa	**,534**	,261	-,054
17	non fatica nel ragionamento	**,453**	,076	,173
18	organizza le sue priorità per ottenere il risultato migliore possibile	,197	**,750**	,011
19	gestisce in modo ottimale i tempi	,114	**,528**	,316
20	pensa al suo futuro	,210	**,466**	,177
21	ha facilità nella memorizzazione	,079	,123	**,744**
22	ricorda ciò che ha imparato a distanza di tempo	,312	,227	**,439**
	% of Variance (Total 41,270)	**18,781**	**12,676**	**9,813**

Table 49 - Reliability and descriptive statistics

Factor	Cronbach's Alpha	N of Items	Mean	Std. Deviation
C1	,80	6	4,57	1,153
C2	,78	6	5,32	1,003
I1	,73	5	4,85	1,057
I2	,64	3	4,54	1,319
I3	,56	2	3,92	1,427

Table 50 - Correlation matrix (p<,05)

	C1	C2	I1	I2
C2	,528			
I1	,221	,236		
I2	,393	,415	,360	
I3	,352	,275	,340	,354

Once selected which position-taking statements hold, we checked for the stability of their original factor structure and their internal consistency performing a factor analysis with maximum likelihood extraction and Varimax rotation (we extracted all factors having eigenvalues greater than 1). We performed the factor analysis both separating competence and intelligence related statements and considering the whole set of statements.

Table 48 - competence and intelligence Rotated Factor Matrix

Item ID	Items	C1	C2	I1	I2	I3
1	Uno studente competente svolge il suo dovere con costanza	**,760**	,064	,075	,093	,054
2	Uno studente competente possiede la costanza necessaria a portare a termine ciò che comincia	**,693**	,234	,079	,123	,111
3	Uno studente competente mostra di sapersi gestire	**,577**	,357	,086	,064	,188
4	Uno studente competente svolge il suo dovere rispettando i tempi	**,522**	,117	,098	,178	,025
5	Uno studente competente sa come comportarsi nel contesto sociale	**,438**	,305	,007	,103	,237
6	Uno studente competente si esprime correttamente	**,422**	,206	,120	,045	,319
7	Uno studente competente analizza la situazione in cui si trova	,344	**,659**	,017	,143	,033
8	Uno studente competente fa collegamenti tra le conoscenze acquisite	,058	**,653**	-,142	,156	,069
9	Uno studente competente controlla se sta facendo bene ciò che vuole fare	,232	**,542**	,305	,093	-,075
10	Uno studente competente comprende ciò che gli viene chiesto e agisce di conseguenza	,**425**	**,496**	,257	,186	-,064
11	Uno studente competente applica in modo efficace le conoscenze alla pratica	,095	**,490**	,178	,011	,113
12	Uno studente competente sviluppa proprie idee su ciò che apprendere.	,182	**,478**	-,011	,122	,211
13	Uno studente intelligente coglie velocemente collegamenti e concetti difficili	,121	,138	**,683**	,079	,150
14	Uno studente intelligente capisce al volo le cose	,202	,023	**,615**	,043	,183
15	Uno studente intelligente comprende molte cose in ambiti cui non è competente	-,033	,017	**,596**	,186	-,024
16	Uno studente intelligente crea collegamenti tra le cose che sa	,061	,094	**,560**	,277	-,186
17	Uno studente intelligente non fatica nel ragionamento	,043	,009	,**468**	,015	,230
18	Uno studente intelligente organizza le sue priorità per ottenere il risultato migliore possibile	,105	,215	,234	**,597**	,028
19	Uno studente intelligente gestisce in modo ottimale i tempi	,275	,111	,137	**,520**	,230
20	Uno studente intelligente pensa al suo futuro	,189	,168	,201	**,412**	,187
21	Uno studente intelligente ha facilità nella memorizzazione	,175	,141	,119	,131	**,547**
22	Uno studente intelligente ricorda ciò che ha imparato a distanza di tempo	,122	,046	,347	,226	**,406**
	% of Variance (Total 42,615)	12,099	10,641	10,154	5,271	4,449

Applying factor analysis on statements grouped by notion (intelligence, comeptence), reproduced the original factors structure both for competence (cf. Table 46) and for intelligence (cf. Table 47) has been reproduced except for the fact that the procedure collapsed together two of the original intelligence factors (4 and 6). The result of the factor analysis performed on the whole set of statements corroborates the overall factor structure (cf. Table 48).

In order to test the factor structure reliability we calculated the Cronbach's Alpha for each of the five factors (cf. Table 49). The resulting internal consistency for C1, C2 and I1 can be defined as acceptable, for factors I2 can be defined as questionable while that of factor I3 have to be defined as poor (George & Mallery, 2003).

In this regard we remark that the correlations among factors (cf. Table 50) is high, this means that the generating principles are not orthogonal, and this could be one of the causes of the barely acceptable psychometric characteristics. The absence of independence cannot be avoided because on one side competence and intelligence notions representations are generated by overlapping reified universes (cf. Chapter I), and on the other the notions themselves are sometimes perceived as overlapped and sometimes as independent (Chapter II).

Once isolated the emerging core of organizing principles used by students in attributing competence and intelligence to students we synthesized their content with a short set of overarching statement (cf. Table 51).

Table 51 - Organizing principles

COMPETENCE	If student (C1) is diligent and (C2) is self-regulated student then competent student
INTELLIGENCE	If student (I1) shows symbolic processing readiness and (I3) shows mnemonic readiness and (I2) is organized then intelligent student

Study VI.a - Competence and intelligence organizing principles: core model confirmation

The goal of this section is to test the factorial validity of the generating principles output of the previous section.

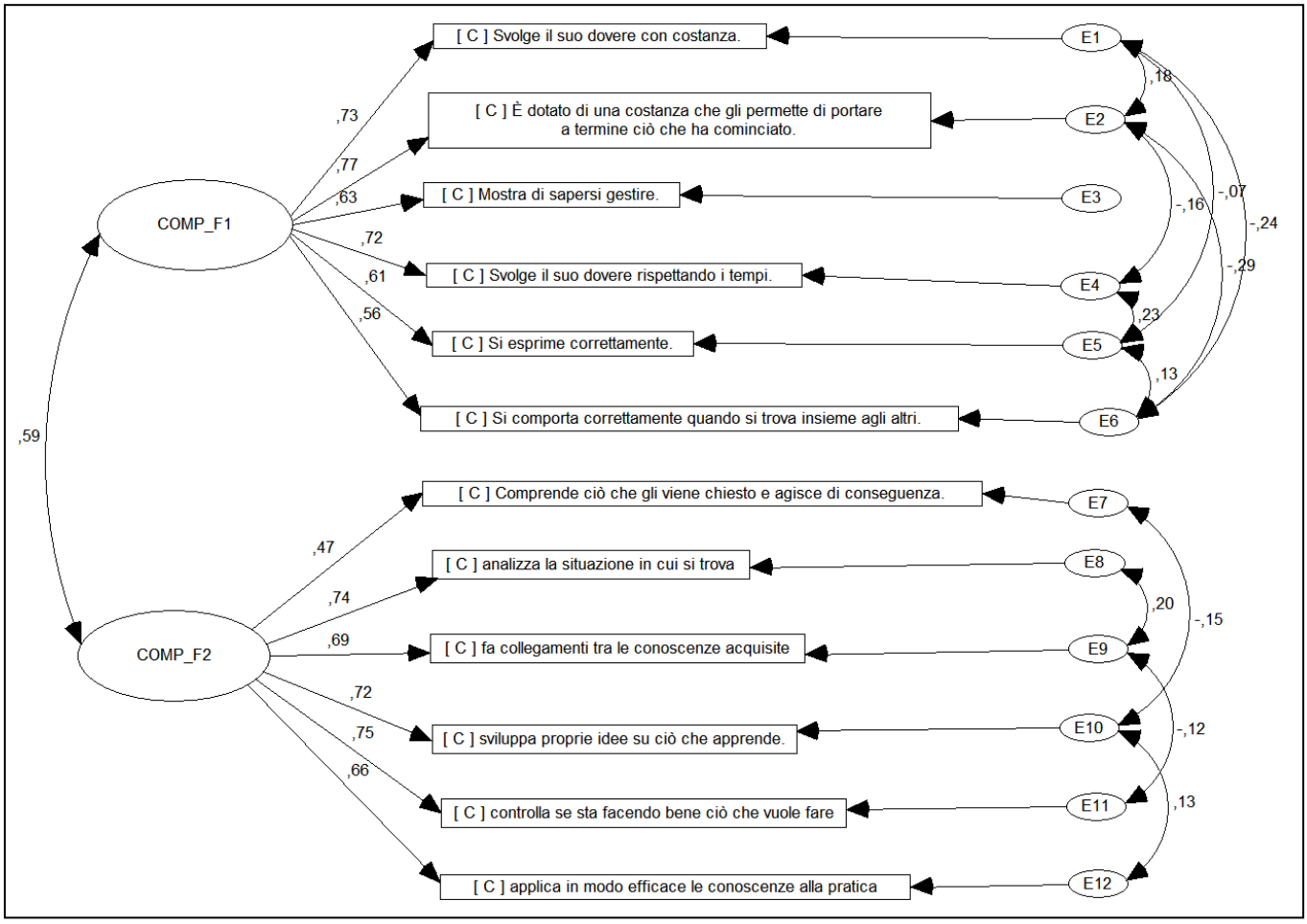
Method

To test their validity we included the two factor structures representing the competence (12 statements, 2 factors) and intelligence (10 statements, 3 factors) generating principles described in Chapter II (cf. Study IV.c). Each statement has been added to the questionnaire administered associated to a 7 levels Likert scale (1: strongly disagree; 7:strongly agree).

We analyzed collected data performing a first order confirmatory factor analysis (2001, Byrne) carried out using Amos 5 software (Arbuckle, 2003) following the same procedure described in chapter II (cf. Study IV.c). We then corroborated the confirmation analysis with an exploratory factor analysis (Maximum likelihood with Varimax rotation imposing the extraction of three factors) and an internal consistency analysis based on Cronbach's Alpha values.

Confirmatory factor analysis

Figure 5 – Competence Factor Model



Results

The first factor structure we tested (cf. Figure 5) strictly reproduced the model we built. Analyzing many good-fit parameters calculated for this model (cf. table 52) we realized that it did not fit well our data: only the AGFI exceeds the minimum threshold defined.

We then tested a second model where we added covariance arcs between error terms according to the modification index table. Results show a better fit, this is particularly true for CFI, SRMR and RMSEA. The remaining parameters are not that far from an acceptable threshold.

Table 52 –Competence model good fit indicators with thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	5,625	4,552	Chi square on degree of freedom
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,849	,884	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,879	,96	Comparative fit index
GFI	*> ,95*	,902	,936	Goodness of fit index
AGFI	*> .8*	,856	,882	Adjusted Goodness of fit index
SRMR	*< ,09*	,092	,080	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,103	,090	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,000	Test of close fit

Figure 6 – Intelligence Factor Model

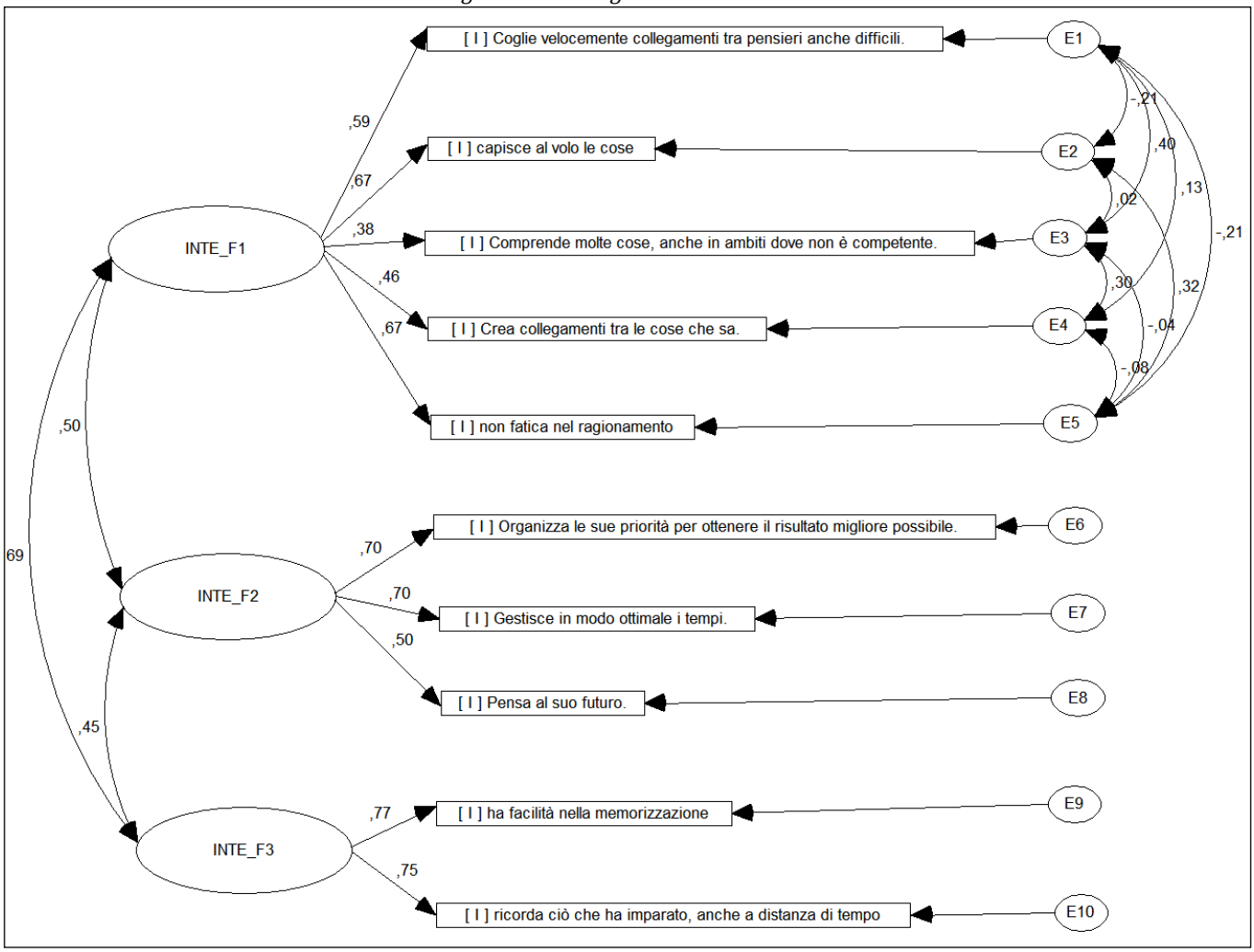


Table 53 – Intelligence model good fit indicators with thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	6,970	2,858	Chi square on degree of freedom
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,758	,925	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,828	,961	Comparative fit index
GFI	*> ,95*	,898	,971	Goodness of fit index
AGFI	*> .8*	,824	,931	Adjusted Goodness of fit index
SRMR	*< ,09*	,073	,041	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,117	,065	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,08	Test of close fit

Also the strict factor structure for the model related to intelligence (cf. Figure 6) does not show an acceptable fit. Adding covariance arcs to error terms, as we did for the previous model, radically changes the quality of fit: all the parameters are above the suggested good-fit thresholds, except for p-value and TLI (cf. Table 53). Confirmatory factor analysis points out that the factor structure associated to the notion of competence does not show a plain good-fit even after the adjustments performed. The effects of adjustments on the intelligence associated factor structure produced a substantial improvement so that we dare talk of acceptable fit.

Exploratory factor analysis

In order to explore the factor structure concealed behind collected data and compare it with the models we built, we performed an exploratory factor analysis and an internal consistency analysis for both competence and intelligence statements sets.

Table 54 - Competence Rotated Factor Matrix

Uno studente competente …	C1	C2
Svolge il suo dovere rispettando i tempi.	**,719**	,177
È dotato di una costanza che gli permette di portare a termine ciò che ha cominciato.	**,691**	,185
Si esprime correttamente.	**,681**	,120
Svolge il suo dovere con costanza.	**,662**	,245
Mostra di sapersi gestire.	**,643**	,103
Comprende ciò che gli viene chiesto e agisce di conseguenza.*	**,590**	,239
Si comporta correttamente quando si trova insieme agli altri.	**,452**	,262
analizza la situazione in cui si trova	,181	**,767**
sviluppa proprie idee su ciò che apprende.	,149	**,728**
fa collegamenti tra le conoscenze acquisite	,217	**,680**
controlla se sta facendo bene ciò che vuole fare	,248	**,671**
applica in modo efficace le conoscenze alla pratica	,178	**,665**
% Variance (total = 48,400)	**25,485**	**22,915**

Table 55 - Intelligence Rotated Factor Matrix

Uno studente itelligente …	I1	I2	I3
non fatica nel ragionamento*	**,751**	,148	,069
capisce al volo le cose*	**,740**	,190	,063
ha facilità nella memorizzazione	**,528**	,105	,260
ricorda ciò che ha imparato, anche a distanza di tempo	**,512**	,148	,240
Comprende molte cose, anche in ambiti dove non è competente.	,126	**,911**	,034
Coglie velocemente collegamenti tra pensieri anche difficili.	,230	**,534**	,268
Crea collegamenti tra le cose che sa.	,226	**,425**	,271
Organizza le sue priorità per ottenere il risultato migliore possibile.	,098	,128	**,708**
Gestisce in modo ottimale i tempi.	,175	,080	**,659**
Pensa al suo futuro.	,113	,141	**,438**
% Variance (total = 46,646)	**18,254**	**14,305**	**14,087**

Results

From exploratory factor analysis emerged a slight difference both in the factor structure of competence and of intelligence. In the analysis of competence related items there was only one item ("Comprende ciò che gli viene chiesto e agisce di conseguenza") that we expected to be assigned to the "metacognitive action" factor and not to the "diligent action" factor (cf. table 54). Regarding intelligence related items two of them resulted displaced ("non fatica nel ragionamento", "capisce al volo le cose").

A possible reason for those differences could be ascribed, for both notions, to the particularly strong correlation (cf. Table 57) characterizing intelligence factors I and III (r=,430; p<,01) and competence factors I and II (r= ,513; p<,01) and to the lower correlation level with the associated factors characterizing the problematic items.

Reliability analysis (cf. Table 56; George & Mallery, 2003; cf. Chapter II for the definition of thresholds) shows good internal consistency for both competence factors and, while for the intelligence scale shows an acceptable level for factors I and III and a questionable but not unacceptable level for factor II.

Table 56 - Reliability Statistics for competence and intelligence

Factor	Cronbach's Alpha	Mean	Std. Deviation	N of Items
C1	,818	5,73	1,14	6
C2	,830	5,35	1,14	6
I1	,730	5,46	1,10	5
I2	,655	5,54	1,25	3
I3	,729	5,45	1,40	2

Table 57 – Pearson correlation

	C1	C2	I1	I2
C2	,513			
I1	,340	,448		
I2	,353	,386	,332	
I3	,274	,372	,430	,312

Study VI.b - Competence and intelligence organizing principles: effects on high school students performance

The main goal of this study is to test the mediating effect of competence and intelligence organizing principles positioning between cultural capital level and a relevant and demanding set of school performances (last term grade in math, and Italian, and the 8th grade final exam score).

Method

Sample

The sample we are using is the one described in Chapter II (Study IV.c).

Measures

As anticipated in the introduction to this work, we conjecture that competence and intelligence organizing principles positioning (Doise, 1986) depends on individual social experience (Berger & Luckmann, 1966; Mead, 1934; Bourdieu & Passeron, 1977; 1983/1986; Duveen & Lloyd, 1990) and manifests through socio-psychological effects (Steele & Aaronson, 1995; Croizet & Millet, 2012). According to this theoretical framework we will test the hypothesis stating that competence and intelligence organizing principles possessed by students mediate between cultural capital level (Prêteur & Vial, 1997) and relevant and demanding school performances (Figure 7).

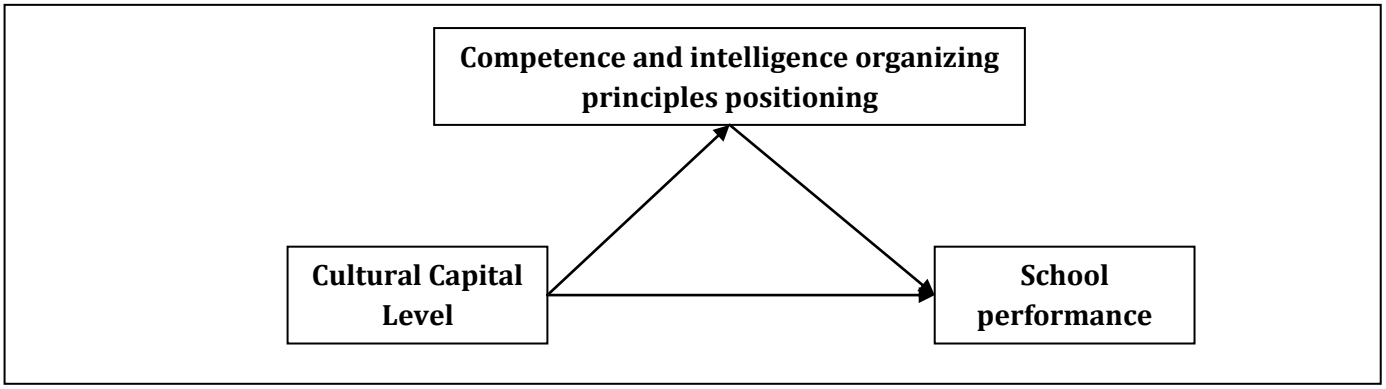
If the mediation effect is significant then the positioning on competence and intelligence organizing principle would be included among the causes of the direct effect of cultural capital on school performance.

To test the mediation model we defined three measures: (1) Competence and intelligence organizing principles, (2) cultural capital level, and (3) School performance.

Competence and intelligence organizing principles positioning

In order to measure competence and intelligence organizing principles positioning we used the statement sets expressly built for this thesis (Box 8; cf. Chapter I,II, III) associated with a 7 levels Likert scale (1: strongly disagree; 7:strongly agree). The score is calculated for each factor as the sum of the scores associated to each individual item member of that factor.

Figure 7 – The reference mediation model we tested in the present study



Box 8 – Summary of competence and intelligence organizing principles

competence-intelligence relation organizing principles:
Factor CI1: competent student, hence intelligent student (5 items)
Factor IC2: intelligent student, hence competent student (5 items)
competence organizing principles:
Factor C1: student is diligent, hence competent (6 items)
Factor C2: student is self-regulated, hence competent (6 items)
intelligence organizing principles:
Factor I1: student shows symbolic processing readiness, hence intelligent (5 items)
Factor I2: student is organized, hence intelligent (3 items)
Factor I3: student shows mnemonic readiness, hence intelligent (2 items)

Cultural capital level

According to Bourdieu's theory of cultural reproduction (Bourdieu & Passeron, 1977) children members of higher class families are advantaged in their school career because they can benefit from higher levels of cultural capital. This is due, in Bourdieu's perspective, to the fact that the school institution has been created as a projection of the higher classes cultural system, with the effect of reproducing, hence legitimizing, their position. Cultural capital in such a perspective acts as the key to success, because those who possess and dress the right *habitus*, not only feel at ease, but interact positively with the scholastic environment.

Specifically Bourdieu (Bourdieu 1983/1986) defines cultural capital as made up of three components: the embodied part, as a set of personal dispositions and cognitions (i.e the organizing principles we are studying); the objectified part, represented by the ensemble of cultural goods; the institutionalized state consisting of legally guaranteed qualifications.

On this topic Sullivan (2001) reviews the operationalizations of cultural capital and claims its usefulness as an explanatory concept. She empirically tests Bourdieus ideas, in particular, the hypothesis that cultural capital is transmitted by higher-class parents to their children and that parental cultural capital is strongly associated with parental social class and with parental qualifications. Moreover she points out that cultural capital is a mechanism through which higher-class families ensure educational advantage for their children. She also considers that the return of this form of capital, as every capital is accumulated with the aim of receiving something back, manifests itself in terms of educational credentials (the higher the capital, the higher the credentials) and occupational success (the higher the capital, the higher the occupational level).

In order to measure cultural capital and test this study, we had hypothesis to identify a robust and effective operationalization for this construct. From what we have just said, one of the aspects strongly connected to cultural capital is parental cultural capital, recognizable parents' actual level of education and occupation. In this respect Prêteur and Vial (1997) built and successfully used a social rating system (socio-cultural affiliation) combining exactly those variables: the father's occupation and the mother's level of education (cf. Table 58).

Table 58 - Table used to determine the socio-cultural affiliation, a proxy of cultural capital (1: highly unfavorable, 2:unfavorable, 3: favorable)

		Father's occupation			
		Unemployed occasional worker, janitor	Craftsman	Clerk, employee, technical	Professional, executive
Mother's education	None, elementary school, middle school	1	1	1	2
	Professional institute	1	1	2	3
	High school	2	2	3	3
	University degree	3	3	3	3

In our study we defined a dichotomous measure for cultural capital level: low when the measure was highly unfavorable and unfavorable, and high when the measure was favorable.

School performance

We considered as relevant and demanding school performance measures the last term students grades obtained in Math and Italian (unsatisfactory: 1; excellent:6), and the 8th grade final exam score (Satisfactory: 1; excellent:5). We chose the former two because according to Selleri, Carugati and Scappini (1995) reading, writing and computation are normative requests of the Italian school system (p. 28). We choose the latter because it can be considered a real turning point in the life an individual: the score obtained orients in the choice of the high school, and consequently will affect his working life in the future.

Procedure

To test our mediation hypothesis we specified the general mediation model (cf. Figure 7) in 9 different single step multiple mediator models (Hayes, 2009), one for each of the three different school performance outcomes each of which replicated for three competence and intelligence organizing principles.

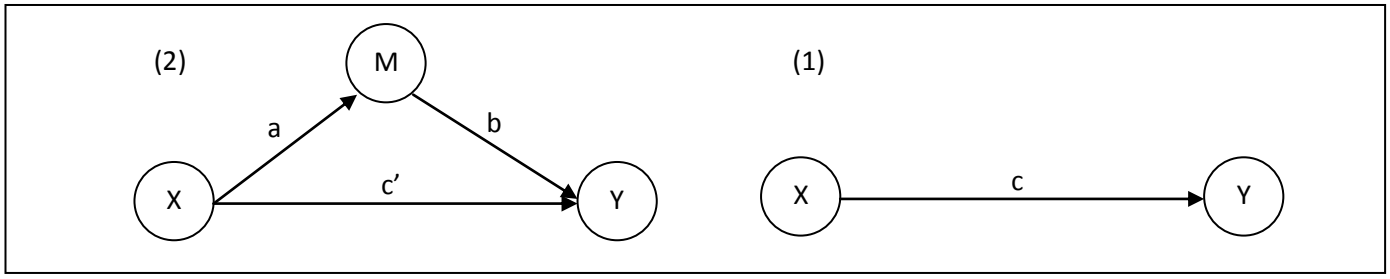
The specified models have been processed using the PROCESS macro ver. 130612 (Hayes, 2012) on SPSS 19. We replaced the missing values for each item in the dataset with its corresponding item mean.

According to Baron and Kenny (1986) and Judd and Kenny (1981) to test mediation we have to control the following four sequential conditions:

1. Establish if variable X, the initial variable, significantly affects the variable Y, the outcome variable (parameter c, the total effect, is significant).
2. Establish if variable X significantly affects the variable M, the mediator (parameter a is significant).
3. Establish if variable M significantly affects the variable Y (parameter b is significant).
4. Establish if M significantly mediates the X-Y relationship, checking if c', the parameter measuring the direct effect is significantly different from c, the parameter measuring the total effect (if null it indicates total mediation; if greater, indicates partial mediation; if smaller, indicates partial inconsistent mediation; MacKinnon, Fairchild, & Fritz, 2007; pp 8,9). The significance of the indirect effect can be tested either with the Sobel test (1982), or with the bootstrapping technique (Bollen & Stine, 1990; Shrout & Bolger, 2002).

The mediation test has been performed on normalized variables in order to be able to compare properly the effect sizes (see Table 68 for the descriptive statistics for normalized variables).

Figure 8 – The general mediation model



Results

In models 1.1, 1.2 and 1.3 condition 1 is not satisfied, this means that cultural capital level did not affect math grades (cf. Tables 59, 60, 61).

In models 2.1 and 3.1 condition 1 is satisfied but condition 2 it is not, this means that there is an effect of cultural capital on Italian grades (R^2= .0646, F(1,433)= 29.88, R=.25, p <.01) and 8th grade final exam score (R^2= .1591, F(1,433)= 81,94, R=.40, p <.01), but there is no significant effect of cultural capital on intelligence generating principle positioning (cf. Tables 62, 65).

In models 2.3 and 3.3 condition 1 and 2 are satisfied, but condition 3 is violated, this means that there is a significant total effect (the same presented for models 2.1 and 3.1), and there is a significant effect also of cultural capital level on both competence and intelligence principles (First factor: R^2= .0109, F(1,433)= 4,77, R=.10, p <.01; Second factor: R^2= .0107, F(1,433)= 4,69, R=.10, p <.01;), but there is no effect of the relation between competence and intelligence principles considered as an independent variable on the score obtained in the 8th grade exam score and Italian grade, considered as a dependent variable (cf. Tables 64, 67).

Finally for both models 2.2 and 3.2 all the four conditions were satisfied and we found a significant mediation effect.

Model 2.2 tested the mediation effect of the two principles related to competence (the first, the student is diligent, and the second, the student is self-regulated) thus explaining part of the action of cultural capital level on the grades obtained during last term. The regression testing condition 1, concerning the total effect of the cultural capital level on Italian grades is significant and explains 6.46% of the variance (R^2= .0646, F(1,433)= 29.88, R=.25, p <.01). The results of the regression testing condition 2 indicates that cultural capital level significantly predicts the positioning only for the first principle, explaining 1,31% of the variance (R^2= .0131, F(1,433)= 5.77, R=.11, p <.05). The multiple regression testing condition 3 and the first part of condition 4, performed between cultural capital level, and both the abovementioned generating principles (considered simultaneously as independent variables), and the last term Italian grades, (considered as the dependent variable), explained 12.14% of the variance (R^2= .1214, F(3,431)= 19.86, p <.01). It was found that the first generating principle (the student is diligent) significantly predicted Italian grades (β =.19, p<.01). Also cultural capital level, controlling for the effect of the generating principles, significantly predicted Italian grades (β = .23, p<.01). Condition 4 is validated because the direct effect (β =.23) is smaller than the total effect (B=25) and the indirect effect is significant (β=.0217, BootLLCI=.0107, BootULCI= .0483, p<.05, the number of bootstrap samples for bias corrected bootstrap confidence intervals is 1000).

Model 3.2 tested the mediation effect of the two generating principles related to competence (the first, student is diligent, and the second, the student is self-regulated) explaining part of the action of cultural

capital level on the score obtained in the 8th grade final exam. The regression testing condition 1, concerning the total effect of the cultural capital level on 8th grade final exam score was significant and explained 15.91% of the variance (R^2= .1591, F(1,433)= 81,94, R=.40, p <.01). The result of the regression performed to test condition 2 was the same as that presented for model 2.2, indicating that cultural capital level significantly predicts the positioning only on the first principle, explaining 1,31% of the variance (R^2= .0131, F(1,433)= 5.76, B=.11, p <.05). The multiple regression performed to test condition 3 and the first part of condition 4, performed between cultural capital level, and both the abovementioned principles considered as independent variables and 8th grade final exam score considered as the dependent variable, explained 19.09% of the variance (R^2= .1909, F(3,431)= 33.89, p <.01). We found that the first principle (the student is diligent) significantly predicted 8th grade final exam score (β =.17, p<.01). Also cultural capital level, controlling for the effect of the principles, significantly predicted 8th grade final exam score (β = .38, p<.01). Condition 4 is validated because the direct effect (β =.38) is smaller than the total effect (R=.40) and the indirect effect is significant (β =.0197, BootLLCI=.0027, BootULCI= .0456, p<.05, the number of bootstrap samples for bias corrected bootstrap confidence intervals is 1000).

Chapter discussion

In this chapter we have identified and tested the principles used by students to attribute competence and intelligence to other students. We have then shown that the mediating effect of the principles on the effect of cultural capital on performance is significant for the competence first principle (the student is diligent) when considering Italian grades and 8th grade final exam score. In both cases the size of the effect is very small. This means that, albeit minimally (the significant effect size is tiny; cf. line a1*b1, Table 63) the difference in positioning on the abovementioned generating principles explain the influence of cultural capital on school performance.

If we take a look at the mediation analysis partial results, we note that the first generating principle related to competence (cf. line a1, Table 60) and the first (cf. line a1, Table 61) and the second (cf. line a2, Table 61) generating principles for the relation between competence and intelligence, depend significantly from the cultural capital level. Also the first intelligence related generating principle shows the tendency to be influenced by cultural capital, while not reaching the requested significant level (cf. line a1, Table 59). This result contributes to corroborate the hypothesis that students positioning towards principles concerning the notions of competence and intelligence, differentiates according to cultural capital level.

We note also that performance results significantly depend on the first intelligence (cf. line b1,Tables 59, 62, and 65) and the first competence (cf. line b1,Tables 60, 63, and 66) generating principles. Also the second intelligence-competence relation generating principle shows a tendency to influence students Italian grades (cf. line b2, Table 64). These results give their contribution in corroborating the idea that student positioning towards relevant notions (i.e. competence and intelligence) affects students school performance.

Last but not least we point out that cultural capital significantly affects students Italian grades (cf. line c, Table 62) and, in particular, the score students obtained in their 8th grade final exam (cf. line c, Table 65). These results are relevant in corroborating the idea that students from low cultural capital families perform worse in the education system and are addressed more frequently towards less valuable curricula in terms of revenues, and employment opportunities (Bourdieu & Passeron, 1977).

Table 59 - Model 1.1: CC → INTE → MG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,0833	,0069	3,0261	1,0000	433,0000	,0826						
a2	,0458	,0021	,9104	1,0000	433,0000	,3405						
a3	,0001	,0000	,0000	1,0000	433,0000	,9981						
b1	,1655	,0274	3,0287	4,0000	430,0000	,0175	,1247	,0544	2,2902	,0225	,0177	,2317
b2							,0212	,0516	,4105	,6816	-,0802	,1226
b3							,0318	,0538	,5918	,5543	-,0739	,1375
c’							,0606	,0479	1,2647	,2067	-,0336	,1547
c	,0700	,0049	2,1311	1,0000	433,0000	,1451						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0094	,0099	-,0082	,0327
a1*b1	,0104	,0080	-,0004	,0315
a2*b2	-,0010	,0032	-,0152	,0023
a3*b3	,0000	,0029	-,0062	,0062

Table 60 - Model 1.2: CC → COMP → MG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1147	,0131	5,7686	1,0000	433,0000	,0167						
a2	,0123	,0002	,0657	1,0000	433,0000	,7979						
b1	,1674	,0280	4,1440	3,0000	431,0000	,0065	,1456	,0558	2,6106	,0094	,0360	,2552
b2							,0136	,0554	,2458	,8059	-,0953	,1225
c'							,0531	,0479	1,1095	,2678	-,0410	,1472
c	,0700	,0049	2,1311	1,0000	433,0000	,1451						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0169	,0093	,0013	,0382
a1*b1	,0167	,0088	,0034	,0397
a2*b2	,0002	,0031	-,0052	,0083

Table 61 - Model 1.3: CC → RELCI → MG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1045	,0109	4,7773	1,0000	433,0000	,0294						
a2	,1035	,0107	4,6912	1,0000	433,0000	,0309						
b1	,0949	,0090	1,3056	3,0000	431,0000	,2721	,0433	,0577	,7513	,4529	-,0700	,1567
b2							,0295	,0577	,5119	,6090	-,0838	,1429
c'							,0776	,0483	1,6063	,1089	-,0173	,1725
c	,0700	,0049	2,1311	1,0000	433,0000	,1451						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	-,0076	,0072	-,0281	,0026
a1*b1	-,0045	,0066	-,0272	,0047
a2*b2	-,0031	,0063	-,0206	,0068

Table 62 - Model 2.1 CC → INTE → IG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,0833	,0069	3,0261	1,0000	433,0000	,0826						
a2	,0458	,0021	,9104	1,0000	433,0000	,3405						
a3	,0001	,0000	,0000	1,0000	433,0000	,9981						
b1	,3379	,1142	13,8588	4,0000	430,0000	,0000	,2351	,0520	4,5239	,0000	,1329	,3372
b2							-,0215	,0492	-,4357	,6633	-,1182	,0753
b3							,0131	,0513	-,2547	,7991	-,1139	,0878
c'							,2335	,0457	5,1098	,0000	,1437	,3233
c	,2541	,0646	29,8811	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0206	,0127	-,0005	,0485
a1*b1	,0196	,0125	-,0012	,0476
a2*b2	,0010	,0029	-,0023	,0118
a3*b3	,0000	,0024	-,0062	,0041

Table 63 - Model 2.2 CC → COMP → IG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1147	,0131	5,7686	1,0000	433,0000	,0167						
a2	,0123	,0002	,0657	1,0000	433,0000	,7979						
b1	,3485	,1214	19,8599	3,0000	431,0000	,0000	,1895	,0530	3,5739	,0004	,0853	,2937
b2							,0787	,0527	1,4933	,1361	-,0249	,1822
c'							,2314	,0455	5,0834	,0000	,1419	,3208
c	,2541	,0646	29,8811	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0227	,0129	,0015	,0517
a1*b1	,0217	,0107	,0044	,0483
a2*b2	,0010	,0045	-,0058	,0134

Table 64 - Model 2.3 CC → RELCI → IG

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1045	,0109	4,7773	1,0000	433,0000	,0294						
a2	,1035	,0107	4,6912	1,0000	433,0000	,0309						
b1	,2754	,0758	11,7863	3,0000	431,0000	,0000	,0099	,0557	,1786	,8583	-,0995	,1194
b2							,1009	,0557	1,8122	,0706	-,0085	,2104
c'							,2656	,0466	5,6949	,0000	,1739	,3572
c	,2541	,0646	29,8811	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	-,0115	,0073	-,0331	-,0007
a1*b1	-,0010	,0057	-,0159	,0087
a2*b2	-,0104	,0069	-,0277	-,0008

Table 65 - Model 3.1 CC → INTE → 8G

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,0833	,0069	3,0261	1,0000	433,0000	,0826						
a2	,0458	,0021	,9104	1,0000	433,0000	,3405						
a3	,0001	,0000	,0000	1,0000	433,0000	,9981						
b1	,4583	,2100	28,5782	4,0000	430,0000	,0000	,2485	,0491	5,0643	,0000	,1521	,3449
b2							-,0941	,0465	-2,0250	,0435	-,1855	-,0028
b3							-,0280	,0485	-,5769	,5643	-,1232	,0673
c'							,3739	,0432	8,6634	,0000	,2891	,4587
c	,3989	,1591	81,9359	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0250	,0124	,0022	,0523
a1*b1	,0207	,0129	-,0049	,0496
a2*b2	,0043	,0054	-,0029	,0214
a3*b3	,0000	,0028	-,0057	,0065

Table 66 - Model 3.2 CC → COMP → 8G

	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1147	,0131	5,7686	1,0000	433,0000	,0167						
a2	,0123	,0002	,0657	1,0000	433,0000	,7979						
b1	,4369	,1909	33,8921	3,0000	431,0000	,0000	,1722	,0509	3,3844	,0008	,0722	,2723
b2							,0131	,0506	,2597	,7952	-,0862	,1125
c'							,3790	,0437	8,6763	,0000	,2931	,4648
c	,3989	,1591	81,9359	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	,0199	,0108	,0017	,0451
a1*b1	,0197	,0105	,0027	,0456
a2*b2	,0002	,0025	-,0037	,0068

Table 67 - Model 3.3 CC → RELCI → 8G

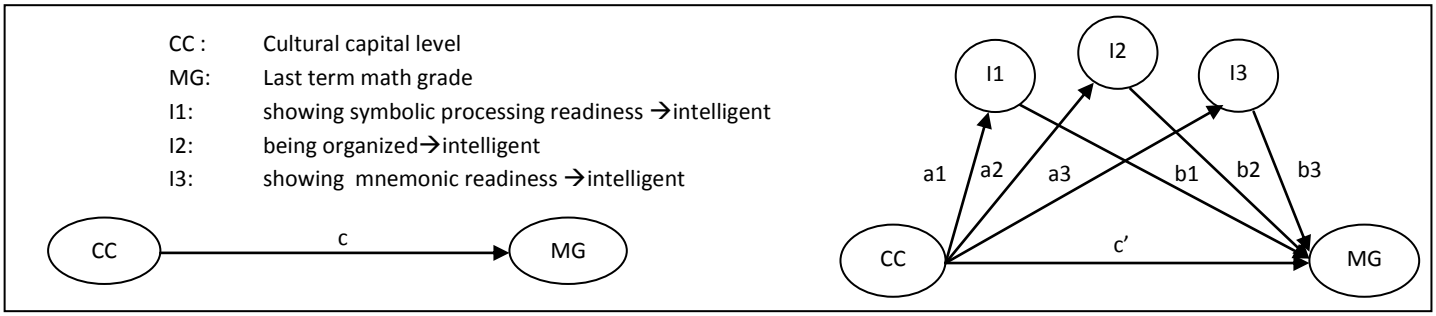
	R	R-sq	F	df1	df2	p	coeff (β)	se	t	p	LLCI	ULCI
a1	,1045	,0109	4,7773	1,0000	433,0000	,0294						
a2	,1035	,0107	4,6912	1,0000	433,0000	,0309						
b1	,3999	,1600	27,3551	3,0000	431,0000	,0000	,0103	,0531	,1934	,8468	-,0941	,1146
b2							,0221	,0531	,4158	,6778	-,0823	,1264
c'							,4023	,0445	9,0478	,0000	,3149	,4896
c	,3989	,1591	81,9359	1,0000	433,0000	,0000						

	Effect (β)	Boot SE	BootLLCI	BootULCI
TOTAL	-,0034	,0061	-,0195	,0063
a1*b1	-,0011	,0058	-,0169	,0090
a2*b2	-,0023	,0060	-,0174	,0072

Table 68 – Normalized variables descriptive statistics

	Minimum	Maximum	Mean		Std. Deviation
			Statistic	Std. Error	
C1	1	7	5,73	,054	1,142
C2	1	7	5,35	,054	1,141
I1	1	7	5,46	,052	1,103
I2	1	7	5,54	,060	1,253
I3	1	7	5,44	,067	1,399
C I 1	1	7	4,01	,069	1,459
I C 2	1	7	3,98	,076	1,597
IG	5	9	6,61	,048	,999
MG	5	10	6,61	,060	1,258
8G	6	10	7,91	,067	1,401
Valid N	435				

Box 9 - Model 1.1

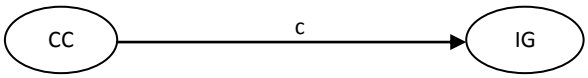


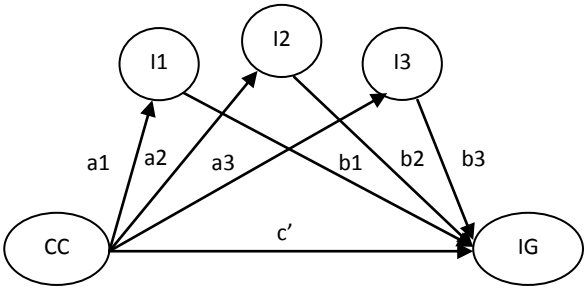
Box 10 - Model 1.2

Box 11 - Model 1.3

Box 12 - Model 2.1

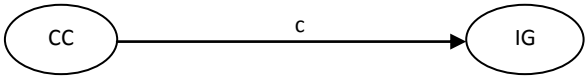
CC : Cultural capital level
MG: Last term Italian grade
I1: showing symbolic processing readiness →intelligent
I2: being organized→intelligent
I3: showing mnemonic readiness →intelligent

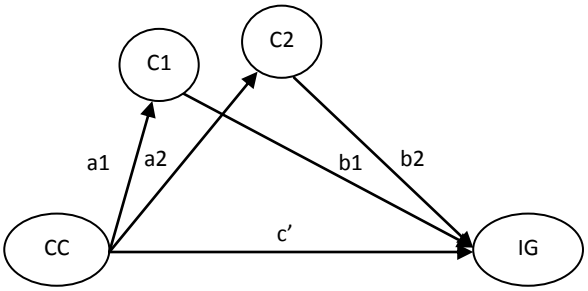




Box 13 - Model 2.2

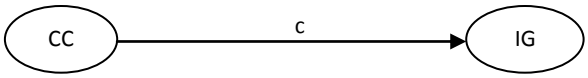
CC : Cultural capital level
MG: Last term Italian grade
C1: being diligent → competent
C2: being self-regulated → competent

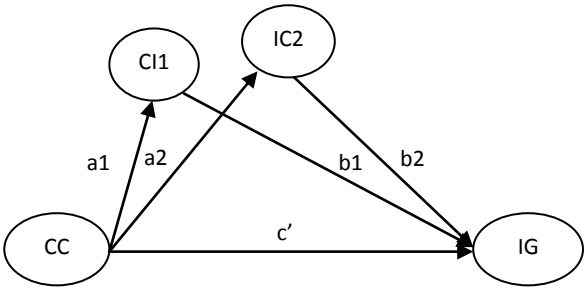




Box 14 - Model 2.3

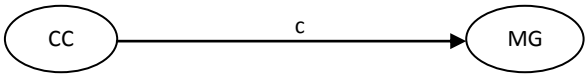
CC : Cultural capital level
MG: Last term Italian grade
CI1: Competent → Intelligent
IC2: Intelligent → Competent

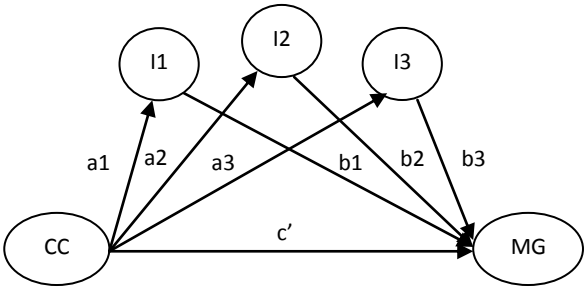




Box 15 - Model 3.1

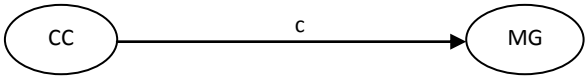
CC : Cultural capital level
MG: Last term math grade
I1: showing symbolic processing readiness →intelligent
I2: being organized→intelligent
I3: showing mnemonic readiness →intelligent

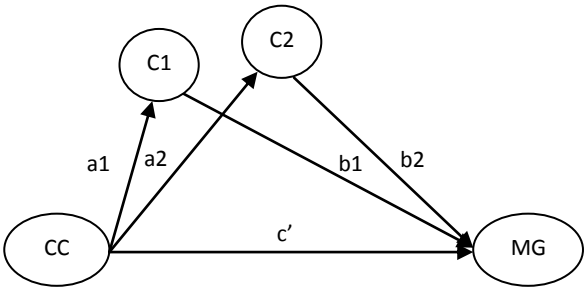




Box 16 - Model 3.2

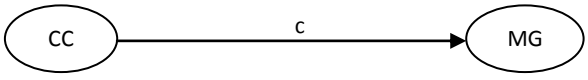
CC : Cultural capital level
MG: Last term math grade
C1: being diligent → competent
C2: being self-regulated → competent

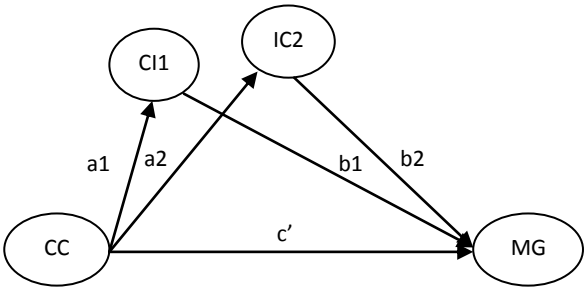




Box 17 - Model 3.3

CC : Cultural capital level
MG: Last term math grade
CI1: Competent → Intelligent
IC2: Intelligent → Competent





CHAPTER IV - Cultural capital, competence and intelligence principles affecting performance

Introduction

In Chapter III we selected and validated a set of position-taking organizing principles to which students refer for attributing competence and intelligence to other students. We showed that cultural capital affects school performance and tested the hypothesis stating that those principles are part of the dynamics explaining the effect of cultural capital on school performance, at least during high school. In doing so, we showed also the direct action of the abovementioned position-taking principles on school performance, and the direct action of cultural capital on position taking.

The first goal of this chapter has been to test the organizing principles models and check if the results just described can be replicated on a college students sample. Second, we have gone a step further testing the hypothesis stating that cultural capital affects performance through the abovementioned position-taking organizing principles, beyond stereotype threat (Steele & Aaronson, 1995; Croizet & Millet, 2012). In order to achieve these goals we rebuilt a computer assisted task (Colom et al., 2004; Larson & Saccuzzo, 1989) that is able to put pressure on the cognitive system and to interact with stereotype threat through the task presentation manipulation. The task we have chosen has also the property of being a proxy measure for the psychometric construct of general intelligence level (Spearman, 1904, 1927). We did that choice because we wanted, in the end, to test the main hypothesis of this thesis: when presenting a task measuring intelligence as a test for competence, the difference in performance between low cultural capital and high cultural capital level students does not disappear. If this were the case, the general question we posed in the title of our work, asking if competence is a wolf in sheep clothing, would receive a first affirmative answer.

Study VII - Cultural capital, competence and intelligence principles: effects on college students performance

Trough this study we tested two hypothesis: the first asserting the existence of a task presentation moderating effect on the relation between cultural capital level and cognitive resource demanding task performance (cf. Box 18.1), and the second asserting the existence of mediating effect of position-taking principles related to competence and intelligence on the relation between cultural capital level and task performance (cf. Box 18.2).

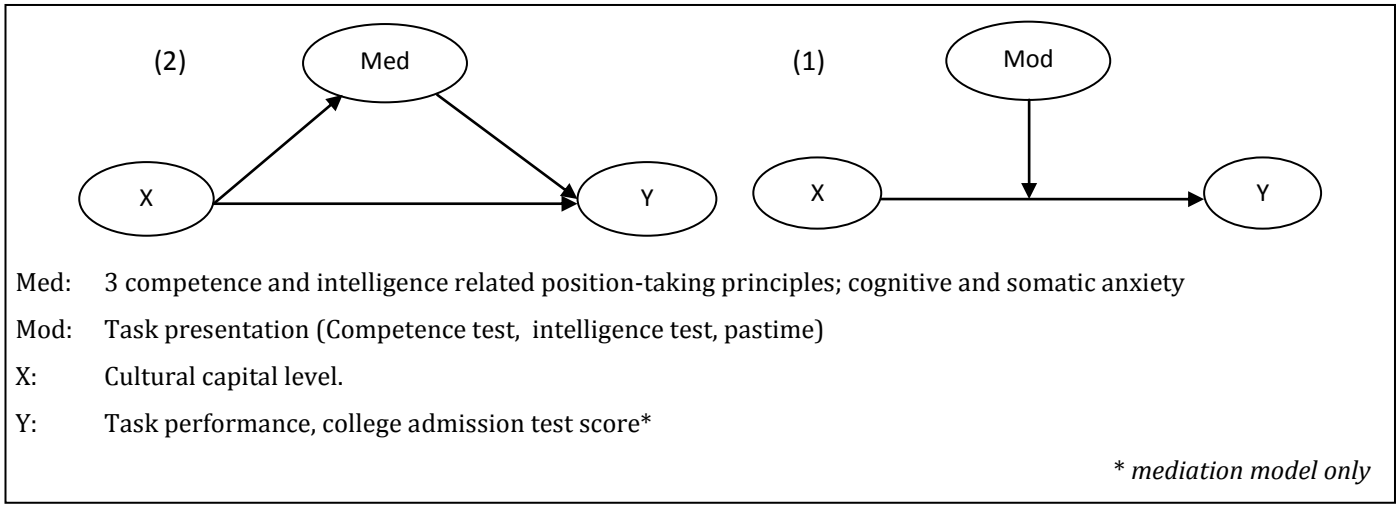
In order to test these hypotheses we used a task capable of straining participants cognitive resources and, at the same time, capable of measuring a valid proxy of the general intelligence construct (this feature will be relevant for Study VIII), we validated the three position-taking organizing principles to which students refer attributing competence and intelligence to other students, and, finally, we validated a scale measuring the self reported perception of cognitive and somatic state anxiety (Gros et al., 2007).

Method

Sample

We recruited for our experiment 184 students of the psychology faculty (n=184, gender: m=49 , f=135, age: M=21.75, SD=2.49). The distribution of participants in the experimental groups is, considering the presentation, well balanced, while shows a significant unbalancing between low and high cultural capital levels (cf. Table *68.a)*.

Box 18 – The mediation model (1) and the moderation model (2)



Med: 3 competence and intelligence related position-taking principles; cognitive and somatic anxiety

Mod: Task presentation (Competence test, intelligence test, pastime)

X: Cultural capital level.

Y: Task performance, college admission test score*

* *mediation model only*

Table 68.a– Cross tabulation of cultural capital with test presentation

>=80% correct		Presentation			Tot
		Pass	Comp	Inte	
Cultural capital level	Low	20	19	20	59
	High	29	30	33	92
Total		49	49	53	151

We excluded from our analysis 25 participants according to the mental counter test scoring algorithm later described. Missing data analysis pointed out that 28 out of 159 cases have no value for college admission test score.

Before its implementation the research protocol has been approved by the University of Bologna's Ethics Committee of the Department of Psychology.

Procedure

Participants have been recruited personally trough an appointment for a specific date and time. The research activity asked every participant to complete several questionnaires and to a computer assisted task. For this reason we chose the psychology faculty computer laboratory as our experimental environment.

We arranged the setting employing only half of the computers available in the laboratory (12 on 24) in order to avoid excessive proximity among participants that could induce possible interferences. In front of each computer, before the participants arrival, we placed a pen, a printed copy of the informed consent, the release for privacy document and the questionnaires. On each computer keyboard the letter S have been covered with a green label where we wrote "Sì" (Yes) and the N letter have been covered with a red label where we wrote "No".

For each experimental session, lasting an average of 40 minutes, we applied the following protocol:

1) Participants were asked to enter the laboratory all at once (up to 12 at a time) and were asked individually to sit down in front of one of the arranged computers identified by a visible number placed behind each monitor.
2) The experimenter thanked participants and asked them to silence their cell phones in order to avoid noise disturbing during the session, summed up the content of the informed consent, said that questions were allowed only during the questionnaires compilation phase, explained some rules concerning the computer assisted task (using only the labeled keyboard keys; Once changed the on screen presentation slide it is impossible to go back); finally the experimenter concluded reminding that the last page of the envelope in front of them had to be filled only after having completed the computer assisted task.
3) If there were no questions the experimenter asked participants to start the activity.
4) At the end of the activity the experimenter collected the completed questionnaires and asked participants to wait while for retrieving the score they achieved in their admission test. To do that, on the last page of each envelope we attached a post-it and asked participants to write their name, surname and date of birth. Once retrieved the datum and written it on the envelope itself, in the presence of the participant, we detached and destroyed the post-it containing personal data, making it anonymous.
5) Before the participants left the laboratory the researcher thanked again and offered the possibility to answer more questions and invited participants to ask for information via e-mail.

After the conclusion of each session the experimenter arranged the setting to get it ready for a new activity. This task took an average of 15 minutes. In a single day we had been able to organize up to 8 different sessions.

Measures

In order to test the abovementioned hypothesis we defined eight different measures.

The initial variable we used in both mediation and moderation models was a two levels cultural capital measure (low & average :1 ; high:2; cf. Chapter III, Table 58; Bourdieu 1983/1986; Bourdieu & Passeron 1977; Prêteur & Vial 1997). For the moderation analysis we considered a three categories presentation variable (objective general intelligence test; general competence test; pastime, the control condition). In order to study the effect of task presentation we prepared three different sets of questionnaires and tests. Each of those elements contained linguistic manipulations replicated in different positions to induce the manipulation effect. We manipulated also the presentation of computer assisted task adding sentences recalling the manipulation.

For moderation analysis we separately used four sets of constructs:

1. Two competence position-taking related principles (cf. Chapter III)
2. Three intelligence position-taking related principles (cf. Chapter III)
3. Two competence-intelligence relationship position-taking principles (cf. Chapter II)
4. A reduced version of the *State–Trait Inventory for Cognitive and Somatic Anxiety* (Gros et al., 2007).

The fourth set of mediators have been introduced to control for the level of anxiety possibly induced by our manipulation. The original scale was available only in English, hence we proceeded to its translation before its use (cf. Figure 20; the Italian translation have been checked by a second expert). The original scale is composed of 42 items, 21 measuring state anxiety and 21 measuring trait anxiety. Five of the items composing the state anxiety scale were too much intrusive, hence we excluded them (cf. Table 69).

At last we introduced two scores used to measure the mental counter test performance (Colom et al., 2004; Larson & Saccuzzo, 1989): speed, measured as a mean participant response time, and precision measured as the percentage of participant correct answers given. The research conducted by Larson and Saccuzzo (1989) pointed out that tasks which demand dynamic memory processing well predicted intelligence level. To achieve this result they tested three different computer assisted tasks engaging at different levels the cognitive system. The best performing one was the most complex of the three, named Mental Counters Test (Larson, 1986). During this test participants, under severe time pressure, keep track in their minds of the values of three independent "counters", whose value changed rapidly and randomly according to specific visual stimuli presented on screen (cf. Table 17).

Table 69 - The five STICSA discarded items

3. I feel agonized over my problems.
9. I Figure some future misfortune
13. I think that the worst will happen.
16. I keep busy to avoid uncomfortable thoughts.
19. I worry that I cannot control my thoughts as well as I would like to.

Table 70 – Representation of a single Mental Counters Test trial.

Step	On screen	Counter adjustment suggested on screen	Participant mental counter values
0	---- ---- ----	0 0 0	0 0 0
1	---- ---- ---- []	0 -1 0	0 -1 0
2	[] ---- ---- ----	0 0 1	0 -1 1
3	[] ---- ---- ----	0 1 0	0 0 1
4	[] ---- ---- ----	1 0 0	1 0 1
5	---- ---- ---- []	0 -1 0	1 -1 1

The original test have been checked against predictive validity. Concerning predictive validity the authors compared the performance participants obtained in the mental counter test to a psychometric composite measure of general intelligence combining standardized scores coming from the following paper and pencil tests:

- The Surface Development (Ekstrom, French, & Harman, 1976).
- The Raven Progressive Matrices (RPM) Test, Advanced (Raven, 1962) .
- Scores on the Scholastic Aptitude Test, Verbal (SATV; Donlon, 1984).
- Scores on the Scholastic Aptitude Test, Math (SATM; Donlon, 1984).

The authors, according to results of correlation analysis, decided upon using standard deviation ($r=-.28$, $p<.01$, $n=343$) rather than mean response time ($r=-.17$, $p<.01$, $n=343$) as the proxy measure for g.

All Those considerations persuaded us to replicate and use in our research activity a test heavily inspired by the mental counter test and paradigm.

We implemented our version of the mental counter test using PsychoPy (Peirce, 2007; 2009), a free of charge open-source programming framework, sponsored by the University of Nottingham, alternative to Presentation™ or e-Prime™, allowing the presentation of stimuli and the collection of response time data for neuroscience, psychology and psychophysics experiments. The test we implemented followed the following time schedule:

1) Presentation of the task through a cover story (cf. Box 19)
2) Slow training phase (15 trials, 3 counters, 5 on screen stimuli each trial, 1.34 second stimulus presentation)
3) Fast training phase (15 trials, 3 counters, 5 on screen stimuli each trial, .75 second stimulus presentation)
4) Alert warning for the end of the training phase and beginning of the test phase with recall of the experimental task presentation manipulation.

5) Slow test phase (15 trials, 3 counters, 5 on screen stimuli each trial, 1.34 second stimulus presentation)
6) Fast test phase (15 trials, 3 counters, 5 on screen stimuli each trial, .75 second stimulus presentation)
7) Slow test phase (15 trials, 3 counters, 7 on screen stimuli each trial, 1.34 second stimulus presentation)
8) Fast test phase (15 trials, 3 counters, 7 on screen stimuli each trial, .75 second stimulus presentation)
9) Presentation of a fictitious result assessing an average performance for all participants

Each of the three counters could range in the interval [-3; +3]. Response time was registered as the time elapsed between the last trial on screen stimulus presentation and the pressure on one of the answer keys. During this timeframe participants can read on the screen the proposed solution for that trial and have to push the key answering the question "Are the numbers displayed on the screen the same and in the same order as those I have in my mind?".

Box 19 – The cover story used for the mental counters test

Il contadino Aristide possiede un pollaio con tre galline ovaiole che depongono uova, ciascuna in una cesta diversa, una a sinistra, una al centro e una a destra. Ogni giorno quando Aristide si sveglia prima dell'alba, le tre ceste sono vuote, infatti le sue galline di notte non depongono uova. Al sorgere del sole le galline cominciano a deporre uova. Queste cadono in una delle ceste e a volte si rompono.

La moglie di Aristide, Cesira, a fine giornata vuole sapere se ogni gallina ha rotto più della metà delle uova che ha deposto. Il dato è importante poiché permette loro di capire se il guscio delle uova prodotte da ciascuna gallina è sufficientemente robusto (si rompono meno della metà delle uova) o troppo fragile (si rompono più della metà delle uova prodotte).

Il lavoro di Aristide consiste nell'osservare le sue tre galline che fanno uova e contare come segue:

- Se l'uovo non si rompe, Aristide ne conta uno in più per quella cesta.

- Se l'uovo si rompe, Aristide ne conta uno in meno per quella cesta.

Aristide a fine giornata riferisce i tre numeri alla moglie Cesira che li annota sul suo registro.

In questi giorni Aristide soffre di un forte mal di testa e non è sicuro di contare bene; così sapendo che quattr'occhi vedono meglio di due, ti chiede di aiutarlo a contare.

We calculated the participant mental counters test score as follows (for a review of the algorithms most used in IAT techniques, cf. Greenwald, Nosek, & Banaji, 2003):

1. Restrict response time data to slow speed trials (42 trials for each sample); we excluded high speed ones because answer correctness was much too low (average 88.3% correct in low speed test; 82.7% correct in high speed test).
2. Eliminate trials with latencies > 10,000 ms
3. eliminate subjects for whom more than 10% of trials have a latency less than 300 ms
4. Do not consider subjects that give less than 80% of correct answers

5. Calculate the speed score as mean response time of correct answers latency values for the selected trials
6. Calculate the variability score as the standard deviation of the response time correct answers latenciy values for the selected trials

In order to check for the predictive validity of our computer assisted task performance output, we identified a reliable performance score, shared by all participants: test score of college admission to the University of Bologna undergraduate degree in behavioral sciences and social relations. The admission test we referred to was composed of five sub-scores (Italian and English language comprehension, use of scientific thought, logic and problem solving, general knowledge) that concurred to the general score.

Mental counters test: testing for predictive validity

Results

In order to test for predictive validity we computed the Pearson correlation coefficient between college admission test scores and mental counter performance scores. We expected to find a significant level of correlation between precision score in mental counter test and Problem solving score because both these tasks have to be executed under strict time constraints, and are based on symbolic processing. We expected also to find a significant correlation between mental counter speed score, the proxy of g, and the problem solving score because two of the tests used to check construct validity for the mental counter test are used as academic admission tests (SATV and SATM) and one of those tests is based on symbolic processing (Raven matrices).

The correlation analysis showed a significant correlation between mental counter test precision score and academic admission test problem solving score ($r=.289$, $n=148$, $p<.01$). The speed score correlation with the problem solving score is not significant ($n=-.142$, $n=148$, $p=.086$), hence convergent validity can be confirmed only for the precision score and not for the speed score.

Competence related organizing principles: core model confirmation

Results

The strict competence related organizing principles model we tested, that is the model reproducing exactly the dependencies expected from theory (cf. Chapter III), according to the most common good fit parameters (cf. Table 71), does not fit our data, in fact none of the calculated parameters respects the suggested good fit thresholds. Adding six covariance arcs to the error terms, not crossing the virtual boundary defined by each factor (cf. Figure 17), the fit of the model increased even if it still remained poor.

Table 71 – Most common CFA good fit indicator's thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	4,490	3,239	Chi square on degree of freedom
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,650	,776	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,719	,847	Comparative fit index
GFI	*> ,95*	,807	,889	Goodness of fit index
AGFI	*> .8*	,715	,808	Adjusted Goodness of fit index
SRMR	*< ,09*	,119	,100	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,138	,111	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,000	Test of close fit

Figure 17 – Competence related position-taking principles model

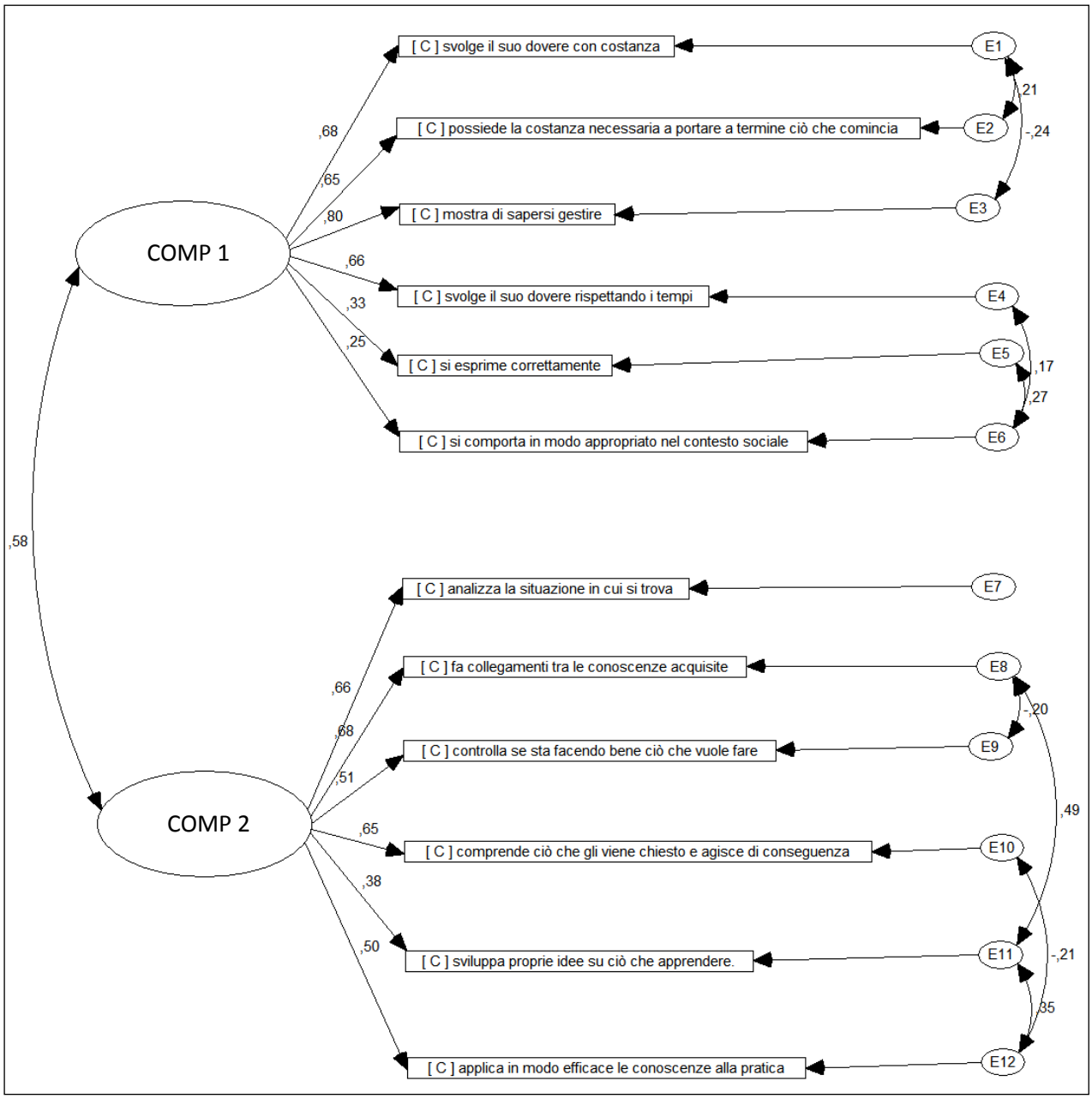


Table 72 - Rotated Factor Matrix

Item ID	Uno studente competente...	COMP 1	COMP 2
1	sviluppa proprie idee su ciò che apprendere.	**,799**	-,108
2	fa collegamenti tra le conoscenze acquisite	**,744**	,111
3	applica in modo efficace le conoscenze alla pratica	**,625**	,131
11	*si comporta in modo appropriato nel contesto sociale	**,473**	,176
4	comprende ciò che gli viene chiesto e agisce di conseguenza	**,404**	,333
5	analizza la situazione in cui si trova	**,397**	,360
12	*si esprime correttamente	**,345**	,272
6	controlla se sta facendo bene ciò che vuole fare	**,344**	,312
7	svolge il suo dovere con costanza	,000	**,758**
8	possiede la costanza necessaria a portare a termine ciò che comincia	,102	**,708**
9	svolge il suo dovere rispettando i tempi	,129	**,642**
10	mostra di sapersi gestire	,304	**,633**
	% Variance explained (tot: 40,470)	20,691	19,780

Table 73 – Natural factors' alfa

Factor	Cronbach's Alpha	N of Items
C1	,779	8
C2	,792	4

Table 74 - Original model factors' alfa

Factor	Cronbach's Alpha	N of Items
C1	,748	6
C2	,737	6

Table 75 – Descriptive statistics

Factor	Mean	Std. Deviation
C1	5,72	,864
C2	5,72	,850

In order to identify some plausible reason for the poor fit of our model, we performed an exploratory factor analysis on the same dataset (n=184; SPSS 19; Extraction Method: Maximum Likelihood. Rotation Method: Varimax) and an internal consistency analysis based on Cronbach's Alpha values.

The emerging factor structure extracted from our sample with respect to our model, shows the displacement of two items (cf. Table 72). This fact causes a reduction of the scale internal consistency. According to George and Mallery (2003) the alpha values for the original factor structure are acceptable for both models, hence we chose to accept the theoretical factorial structure despite the confirmatory analysis poor results.

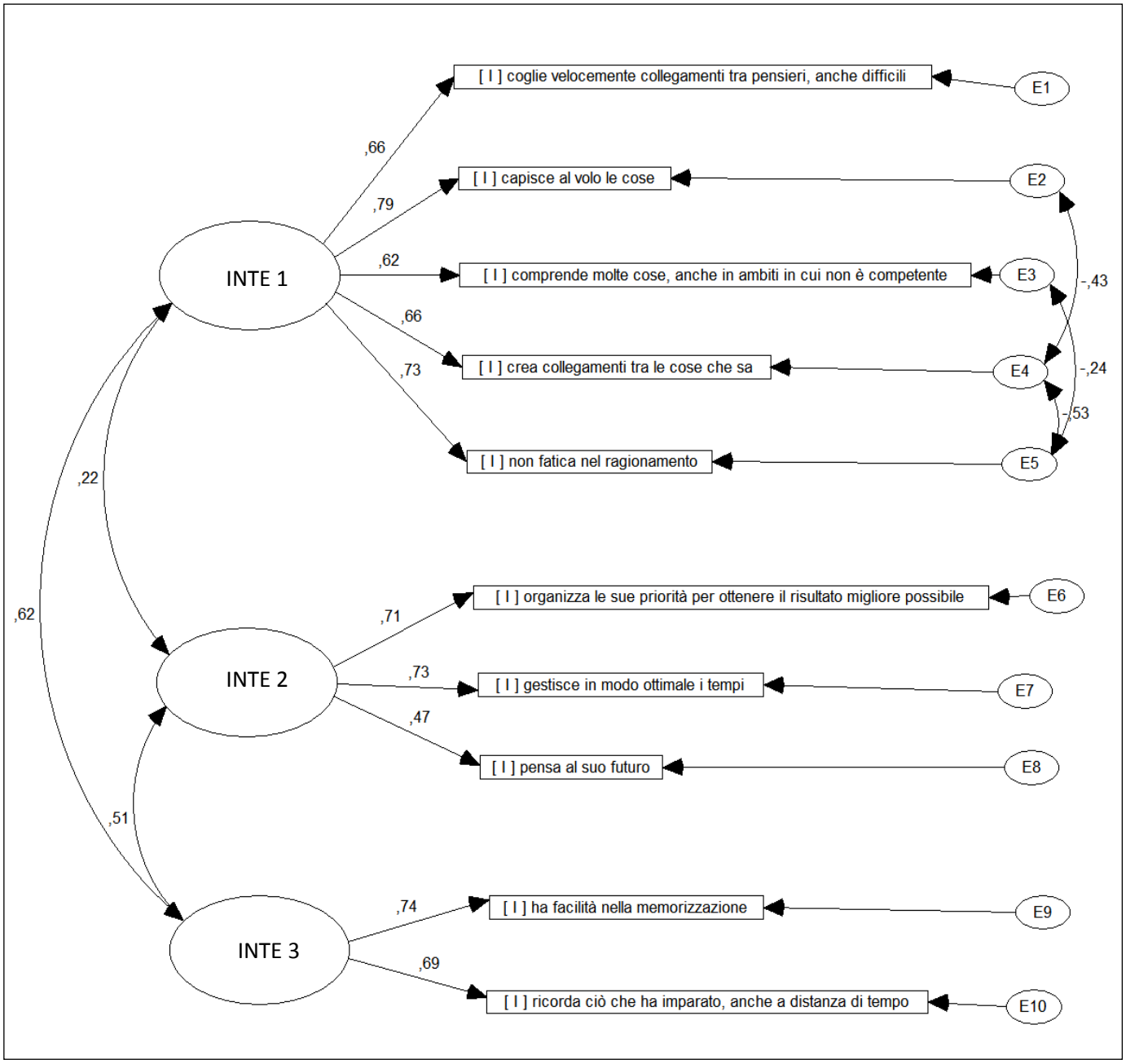
Intelligence related organizing principles: core model confirmation

Results

Table 76 – Most common CFA good fit indicator's thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good; < 5 sometimes permissible*	2,252	1,559	Chi square on degree of freedom
p-value	*> .05*	,000	,028	p-value for the model
TLI	*> .95*	,882	,947	Tucker-Lewis coefficient
CFI	*> .95 Great; > .9 Traditional; > .8 sometimes permissible*	,916	,966	Comparative fit index
GFI	*> ,95*	,925	,955	Goodness of fit index
AGFI	*> .8*	,870	,915	Adjusted Goodness of fit index
SRMR	*< ,09*	,063	,055	Standardized Root Mean Residual
RMSEA	*< ,05 Good; between ,05 and ,10 moderate; >.10 Bad*	,083	,055	Root mean square error of approximation
PCLOSE	*> ,05*	,020	,363	Test of close fit

Figure 18 – Intelligence related position-taking principles model



The validation of the Intelligence related organizing principles model shows, although in its strict form, a moderate fit. Once added the covariance arcs to error terms, as suggested by the model modification indices, our model, according to the most common good fit indicators considered, shows indeed a good fit (cf. Table 76).

We expect that the model emerging from exploratory factor analysis will corroborate this fact (n=184; SPSS 19; Extraction Method: Maximum Likelihood. Rotation Method: Varimax).

As we expected, the factor structure emerging from the latter exploratory analysis corresponds exactly to the theoretic structure formerly confirmed (cf. Table 78). According to George and Mallery (2003) our factors' internal consistency level can be considered good for the first factor and questionable for the second and the third (cf. Table 79).

Table 78 - Rotated Factor Matrix

Item ID	Uno studente intelligente…	INTE 1	I NTE 2	I NTE 3
1	capisce al volo le cose	**,824**	,052	,046
2	non fatica nel ragionamento	**,688**	-,089	,141
3	coglie velocemente collegamenti tra pensieri, anche difficili	**,662**	,130	,089
4	comprende molte cose, anche in ambiti in cui non è competente	**,564**	,170	,206
5	crea collegamenti tra le cose che sa	**,396**	,149	,303
6	organizza le sue priorità per ottenere il risultato migliore possibile	,125	**,708**	,076
7	gestisce in modo ottimale i tempi	,081	**,683**	,141
8	pensa al suo futuro	,020	**,489**	,102
9	ricorda ciò che ha imparato, anche a distanza di tempo	,186	,220	**,952**
10	ha facilità nella memorizzazione	,407	,216	**,409**
	% Variance explained (tot: 49,428)	22,874	13,823	12,730

Table 79 - Intelligence scale reliability and descriptive statistics

Factor	Cronbach's Alpha	Mean	Std. Deviation	N of Items
I1	,779	5,42	1,026	5
I2	,654	5,01	1,137	3
I3	,674	4,96	1,307	2

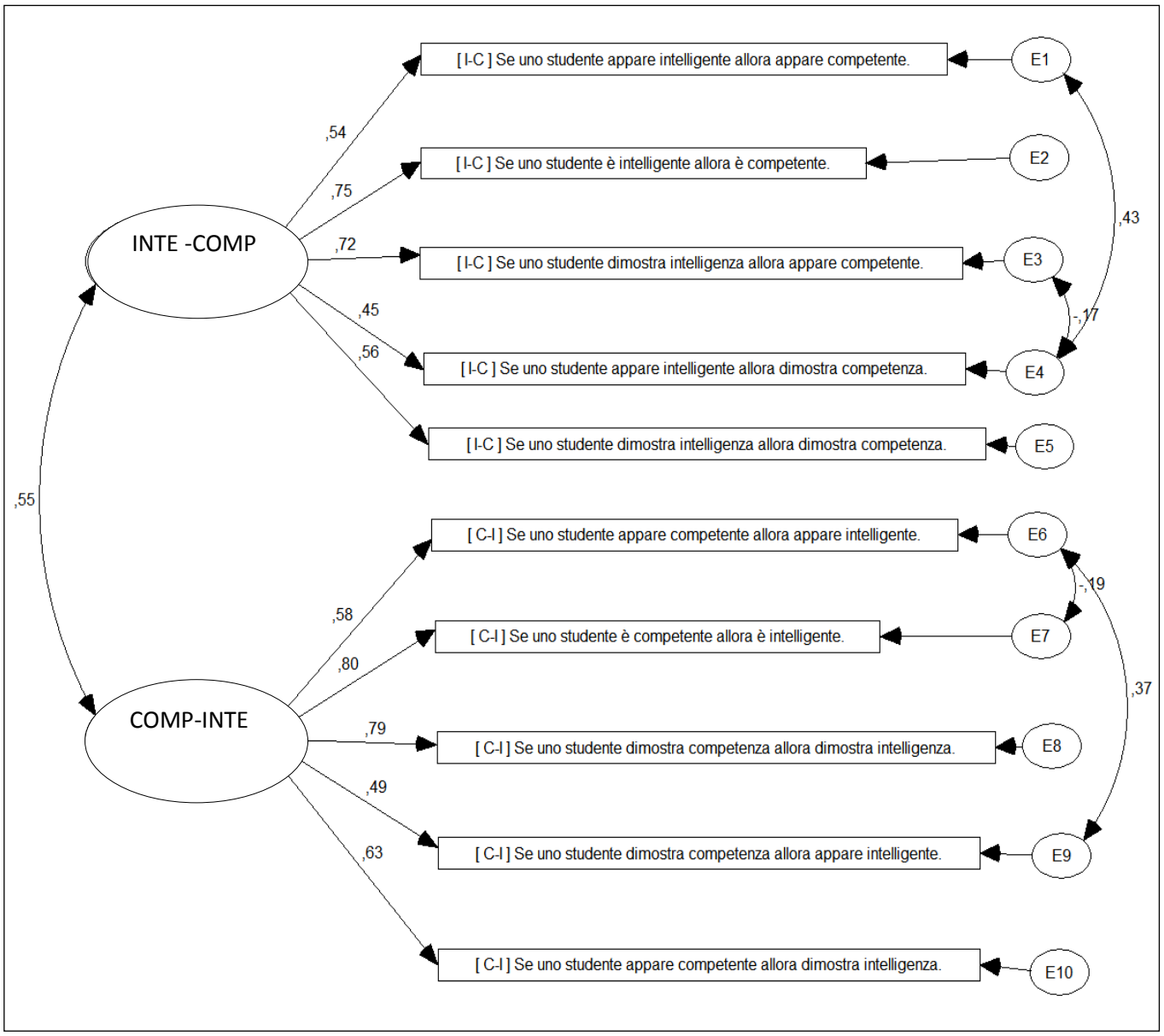
Intelligence-competence relationship organizing principles: core model confirmation

Results

Table 80 – Most common CFA good fit indicator's thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	4,752	3,158	Chi square on degree of freedom
p-value	*> .05*	,000	,000	p-value for the model
TLI	*> .95*	,772	,840	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,790	,893	Comparative fit index
GFI	*> ,95*	,849	,921	Goodness of fit index
AGFI	*> .8*	,756	,854	Adjusted Goodness of fit index
SRMR	*< ,09*	,084	,065	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,143	,109	Root mean square error of approximation
PCLOSE	*> ,05*	,000	,000	Test of close fit

Figure 19 – Competence-intelligence related position-taking principles model



According to the model parameter values of the strict Intelligence-competence relationship organizing principles, the model fit would not be acceptable. After having it adjusted applying the same strategy as we did for the previous models, we were able to achieve a barely acceptable fit (cf. Table 80).

As we did for the other models of this study, we performed an exploratory factor analysis (n=184; SPSS 19; Extraction Method: Maximum Likelihood. Rotation Method: Varimax) and an internal consistency analysis based on Cronbach's Alpha values. The emerging factors from the exploratory analysis are identical to those tested in the confirmed model. They yet show good reliability for factor one and acceptable reliability for factor two (George and Mallery 2003).

Table 81 - Rotated Factor Matrix

Item ID		COMP-INTE	INTE-COMP
1	Se uno studente dimostra competenza allora appare intelligente.	**,720**	-,072
2	Se uno studente appare competente allora appare intelligente.	**,679**	,078
3	Se uno studente dimostra competenza allora dimostra intelligenza.	**,646**	,331
4	Se uno studente è competente allora è intelligente.	**,616**	,345
5	Se uno studente appare competente allora dimostra intelligenza.	**,563**	,310
6	Se uno studente appare intelligente allora appare competente.	,036	**,708**
7	Se uno studente appare intelligente allora dimostra competenza.	,029	**,652**
8	Se uno studente è intelligente allora è competente.	,202	**,622**
9	Se uno studente dimostra intelligenza allora appare competente.	,286	**,535**
10	Se uno studente dimostra intelligenza allora dimostra competenza.	,279	**,403**
	% Variance explained (tot: 43,945)	22,960	20,985

Table 82 – Reliability and descriptive statistics

Factor	Cronbach's Alpha	Mean	Std. Deviation
C-I 1	,804	3,86	1,239
I-C 2	,748	4,09	1,249

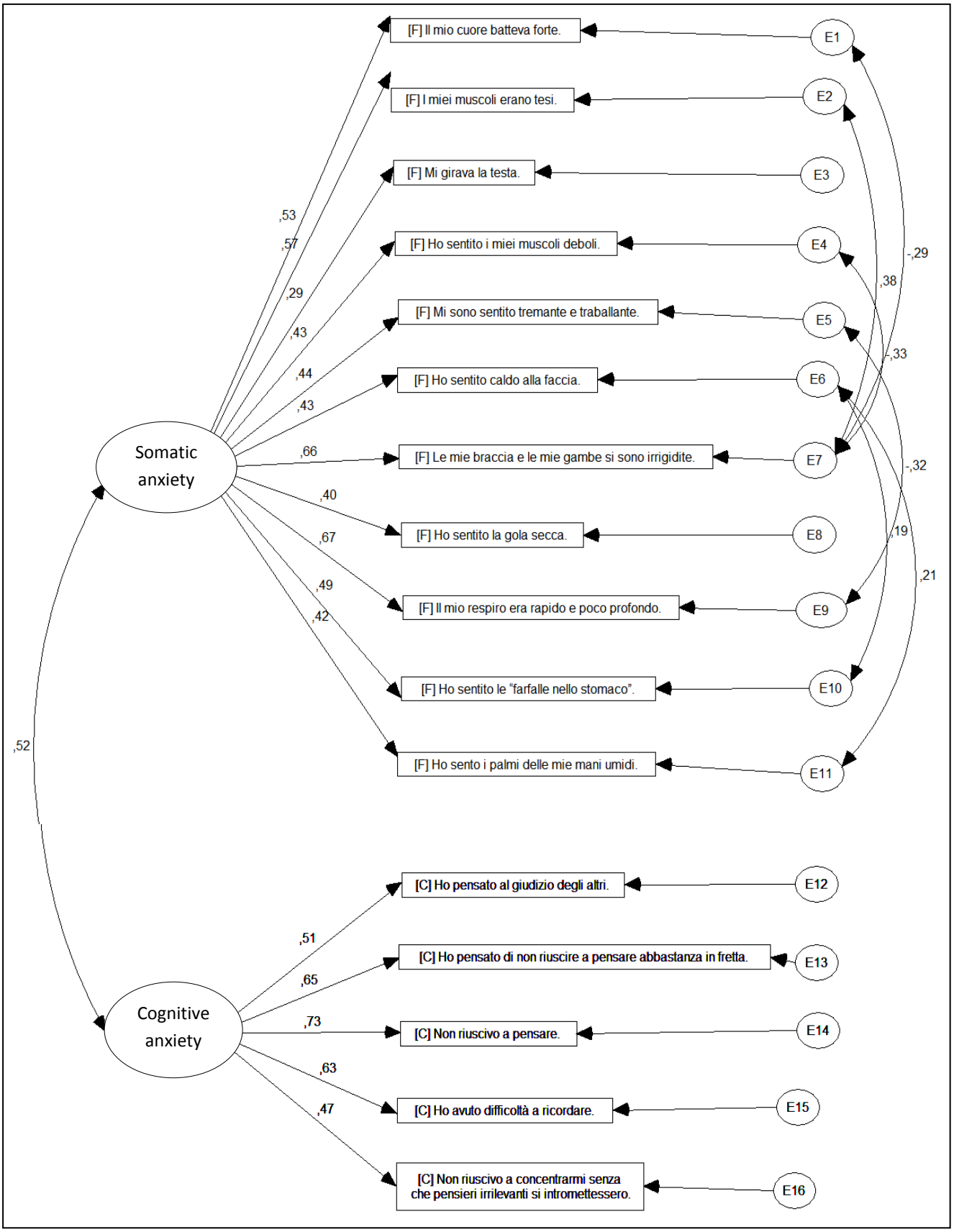
Somatic and cognitive anxiety inventory: model confirmation

Results

Table 83 – Most common CFA good fit indicator's thresholds (Hu & Bentler 1999)

Parameter acronym	Good fit Threshold	Strict Model Parameter values	Optimized Model Parameter values	Parameter description
CMIN/DF	*< 3 good;* *< 5 sometimes permissible*	1,966	1,297	Chi square on degree of freedom
p-value	*> .05*	,000	,026	p-value for the model
TLI	*> .95*	,805	,940	Tucker-Lewis coefficient
CFI	*> .95 Great;* *> .9 Traditional;* *> .8 sometimes permissible*	,832	,951	Comparative fit index
GFI	*> ,95*	,881	,921	Goodness of fit index
AGFI	*> .8*	,843	,890	Adjusted Goodness of fit index
SRMR	*< ,09*	,073	.060	Standardized Root Mean Residual
RMSEA	*< ,05 Good;* *between ,05 and ,10 moderate;* *>.10 Bad*	,073	,040	Root mean square error of approximation
PCLOSE	*> ,05*	,007	,768	Test of close fit

Figure 20 – STICSA *Factor Model*



The first somatic and cognitive anxiety inventory we tested replicated the exact theoretical structure of the original STICSA state scale (Gros et al., 2007). Many of the good fit parameters does not reach the suggested good fit thresholds, and where this happens, the level tells that the fit is between moderate and permissible (cf. Table 83). Once optimized the model (cf. Figure 20) showed a good fit level for almost all parameters (TLI and GFI are yet not far from their good fit thresholds).

To corroborate these findings we performed an exploratory factor analysis (n=159; SPSS 19; Extraction Method: Maximum Likelihood. Rotation Method: Varimax).

The emerging factor structure, except for two low factor correlation items (marked with *), is superimposable to the theoretically expected one.

Reliability statistics corroborate previous findings concerning the goodness of fit for the latent model. The alpha values can be considered all acceptable according to George and Mallery (2003). The anxiety scale seems stable enough to be used in our study.

Table 84 - Rotated Factor Matrix

Item ID	Item	Somatic anxiety	Cognitive Anxiety
1	Le mie braccia e le mie gambe si sono irrigidite.	**,746**	,113
2	I miei muscoli erano tesi.	**,736**	,041
3	Il mio respiro era rapido e poco profondo.	**,614**	,160
4	Ho sentito caldo alla faccia.	**,444**	,124
5	Il mio cuore batteva forte.	**,438**	,224
6	Ho sentito le “farfalle nello stomaco”.	**,403**	,205
7	Ho sento i palmi delle mie mani umidi.	**,395**	,125
8	Ho sentito la gola secca.	**,347**	,202
9	Mi sono sentito tremante e traballante.	**,282**	,203
12	Non riuscivo a pensare.	,143	**,723**
13	Ho avuto difficoltà a ricordare.	,115	**,631**
14	Ho pensato di non riuscire a pensare abbastanza in fretta.	,185	**,607**
15	Non riuscivo a concentrarmi senza che pensieri irrilevanti si intromettessero.	,078	**,463**
16	Ho pensato al giudizio degli altri.	,244	**,455**
10	*Mi girava la testa.	,168	**,355**
11	*Ho sentito i miei muscoli deboli.	,218	**,223**
	% of Variance (Tot: 29,516)	16,186	13,330

Table 85 - Reliability Statistics

	Cronbach's Alpha	N of Items
Ansia somatica	,761	11
Ansia cognitiva	,730	5

Table 86– Descriptive statistics

		Livello Ansia Cognitiva	Livello Ansia Somatica
N	**Valid**	155	155
	Missing	4	4
Mean		2,14	1,49
Std. Deviation		,668	,585

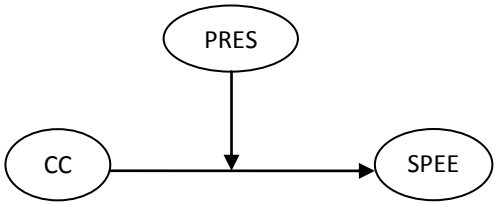
Task presentation: a moderator of cultural capital level effect on task performance

Results

In this paragraph we tested the hypothesis stating that task presentation (as an intelligent test, as a competence test, or as a pastime) moderates the effect of cultural capital on performances in the mental counters test, a task built to strain participants cognitive resources. In particular we expected, because of stereotype threat activation (Steele & Aaronson, 1995; Croizet & Millet, 2012), a significant difference in performance favoring high cultural capital students when the test is presented as an intelligence test and not in other conditions. In order to detect the activation of stereotype threat we tested the presentation effect moderation on the relation between cultural capital and participants self-reported state anxiety (Spencer et al., 1999; Steele, 1997; Steele et al., 2002, pp 399, 400) measured at the end of the test. All the Univariate ANOVA moderation analyses have been performed with SPSS 19 (???).

To compare the effect of cultural capital level on mental counters test performance measured as mean response time in intelligence test, competence test, and pastime presentation conditions (cf. Figure 21), we conducted a factorial ANOVA.

Figure 21 – Model 1, descriptive statistics

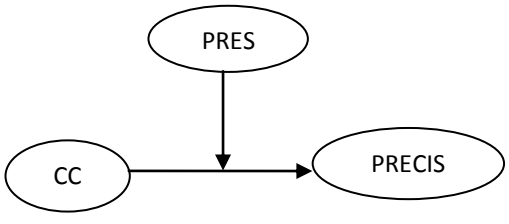


Speed (sec.)		CC						Total		
		Low			High					
		Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
PRES	PASS	2,07	,758	20	2,08	,507	29	2,07	,615	49
	COMP	1,87	,576	19	1,91	,562	30	1,89	,562	49
	INTE	1,91	,474	20	1,69	,354	33	1,77	,413	53
Total		1,95	,610	59	1,88	,499	92	1,91	,544	151

The analysis pointed out a significant effect of the presentation condition on the performance measured at the p<.05 level for the three conditions (F(2,145)=3.181, p=.044). Neither the cultural capital level (F(2,145)= .372, p= .543) nor the interaction between cultural capital and task presentation (F(2,145)=.854, p=.428) showed a significant effect on the measured performance for the three conditions. Taken together, these results show that cultural capital did not affect participants performance when is measured as mean response time (speed), hence it does not even make sense to speak of moderation.

The second moderation model we tested is similar to the latter, except for the performance that is now measured as precision (number of corrected answers out of total answers given).

Figure 22 – Model 2, descriptive statistics



Precision (%)		CC						Total		
		Low			High					
		Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
PRES	PASS	92,26	5,563	20	90,96	5,914	29	91,4966	5,750	49
	COMP	92,10	4,422	19	91,82	5,256	30	91,9339	4,904	49
	INTE	87,97	5,266	20	91,05	4,688	33	89,8922	5,091	53
Total		90,75	5,416	59	91,27	5,238	92	91,0754	5,297	151

Also for this model we found a significant effect of the presentation condition on the performance measured at the p<.05 level for the three conditions (F(2,145)=3.141, p=.046). Neither the cultural capital level (F(2,145)= .331, p= .556) nor the interaction between cultural capital and task presentation (F(2,145)=2.344, p=.100) showed a significant effect on the measured performance for the three conditions.

These results show that cultural capital did not affect participants performance when it is measured as task precision, hence, once again, it does not even make sense to speak of moderation.

For the sake of exploration we present the results of post hoc test. The Bonferroni adjusted pairwise comparison based on estimated marginal means, when considering low cultural capital level showed a significant difference (p<.05) between intelligence and pastime presentations and between intelligence and competence presentations. There is also a significant difference (p <.05) if we consider the intelligence presentation between low and high cultural capital. No other significant difference emerged (cf. Table 87).

Figure 21 – Bar chart showing performance means for data used to test model 2.

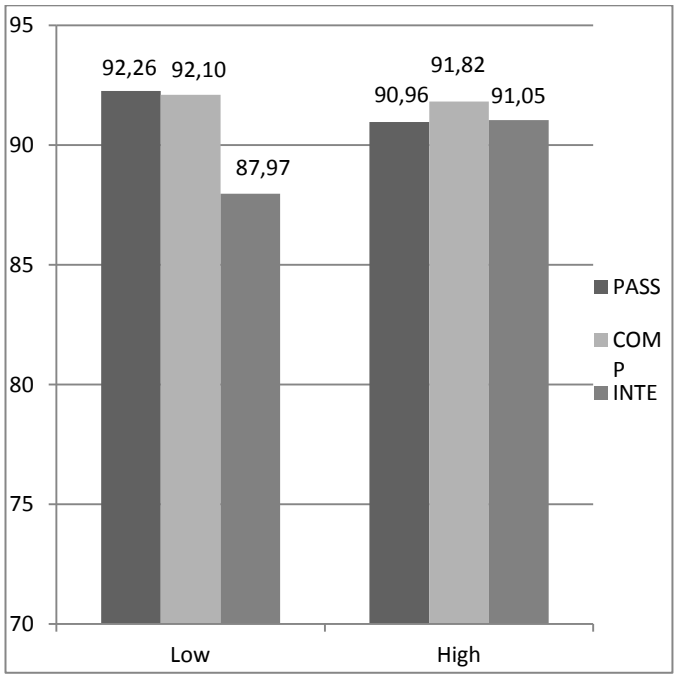
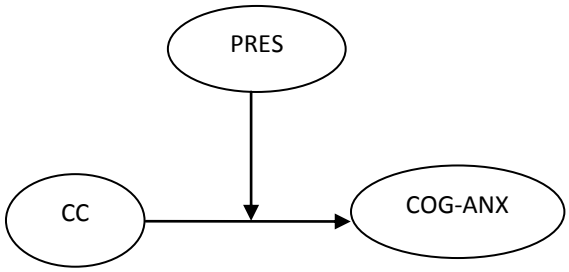


Table 87 - Pairwise Comparisons based on estimated marginal means, with Bonferroni adjustment for multiple comparisons.

		PRES (I)	PRES (J)	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
CC	*Low*	*PASS*	*COMP*	.157	1.672	1.000	-3.894	4.207
			INTE	4.28	1.651	.031	.287	8.284
		COMP	*PASS*	-.157	1.672	1.000	-4.207	3.894
			INTE	4.12	1.672	.044	.079	8.180
		INTE	*PASS*	-4.28	1.651	.031	-8.284	-.287
			COMP	-4.12	1.672	.044	-8.180	-.079
	High	*PASS*	*COMP*	-.857	1.359	1.000	-4.149	2.436
			INTE	-.085	1.329	1.000	-3.303	3.134
		COMP	*PASS*	.857	1.359	1.000	-2.436	4.149
			INTE	.772	1.317	1.000	-2.417	3.961
		INTE	*PASS*	.085	1.329	1.000	-3.134	3.303
			COMP	-.772	1.317	1.000	-3.961	2.417

For the third moderation model we tested if the effect of cultural capital on self reported cognitive anxiety level is moderated by the task presentation. The analysis didn't show any significant result.

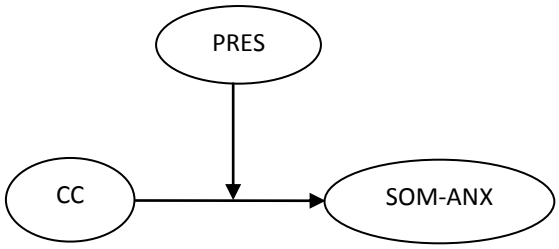
Figure 22 – Model 3, descriptive statistics



Cognitive Anxiety		CC						Total		
		Low			High					
		Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
PRES	PASS	2,10	,640	20	2,07	,529	29	2,08	,571	49
	COMP	2,32	,746	19	2,10	,758	30	2,19	,753	49
	INTE	2,25	,550	20	2,09	,765	33	2,15	,690	53
Total		2,22	,644	59	2,09	,689	92	2,14	,673	151

For the fourth and last moderation model we tested if the effect of cultural capital on self reported somatic anxiety level is moderated by the task presentation.

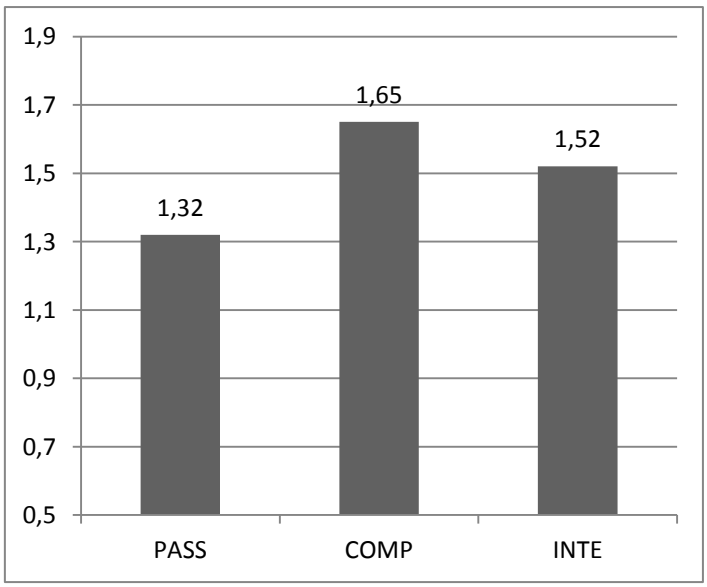
Figure 22 – Model 4, descriptive statistics



Somatic Anxiety		CC						Total		
		Low			High					
		Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
PRES	PASS	1,30	,470	20	1,34	,464	29	1,32	,462	49
	COMP	1,60	,591	19	1,68	,533	30	1,65	,551	49
	INTE	1,65	,745	20	1,45	,564	33	1,52	,638	53
Total		1,51	,622	59	1,49	,537	92	1,50	,570	151

The analysis shows a significant effect of the presentation condition on the somatic anxiety level at the p<.05 level for the three conditions (F(2,145)=4.130, p=.018). Neither the cultural capital level (F(2,145)= .067, p= .796) nor the interaction between cultural capital and task presentation (F(2,145)=.864, p=.423) showed a significant effect (cf. Figure 22). Post hoc comparison using the Bonferroni test indicated that the mean score for the pastime condition (M=1.32, SD=.462) is significantly different from the competence condition (M=1.65, SD=.638). However the intelligence condition (M=1.52, SD= .638) did not significantly differ from the pastime and competence condition.

Figure 22 – Mean somatic anxiety level



Taken together, these results show that the presentation significantly affected self reported somatic anxiety, at least in the competence test presentation condition, but this is not true for cultural capital, hence it does not even make sense to speak of moderation. For the sake of data exploration we show the results of the post hoc test. The Bonferroni adjusted pairwise comparison based on estimated marginal means shows no significant differences (cf. Table 88).

Figure 23 – Bar chart showing self reported somatic anxiety levels for data used to test model 4.

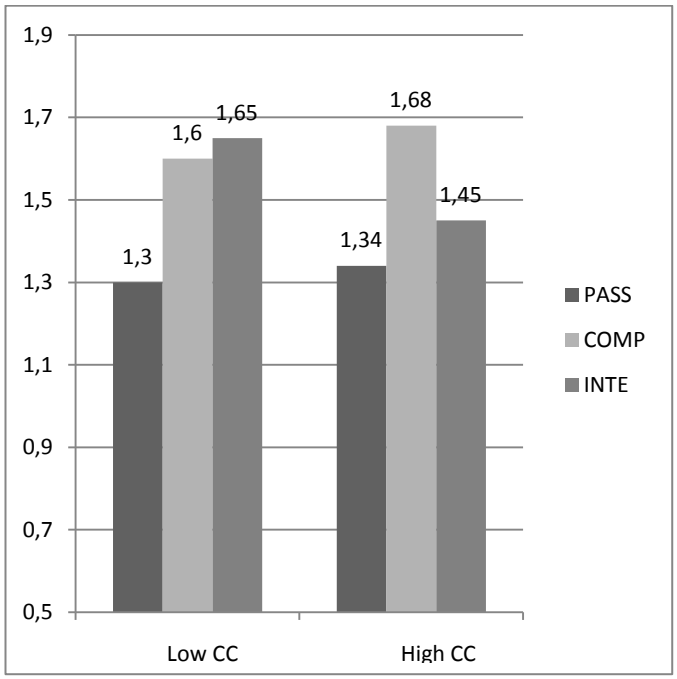


Table 88 - Pairwise Comparisons based on estimated marginal means, with Bonferroni adjustment for multiple comparisons.

		PRES (I)	PRES (J)	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
CC	*Low*	*PASS*	*COMP*	-.305	.179	.274	-.740	.130
			INTE	-.350	.177	.150	-.779	.079
		COMP	*PASS*	.305	.179	.274	-.130	.740
			INTE	-.045	.179	1	-.480	.390
		INTE	*PASS*	.350	.177	.150	-.079	.779
			COMP	.045	.179	1	-.390	.480
	High	*PASS*	*COMP*	-.339	.146	.065	-.692	.015
			INTE	-.110	.143	1	-.455	.235
		COMP	*PASS*	.339	.146	.065	-.015	.692
			INTE	.229	.141	.323	-.114	.571
		INTE	*PASS*	.110	.143	1	-.235	.455
			COMP	-.229	.141	.323	-.571	.114

Competence and intelligence related generating principles: mediators between cultural capital level and task performance.

Results

For this paragraph we tested the mediation effect of competence and intelligence generating principles between the effect of cultural capital level on task performance (cf. Box 18.2). We performed the same statistical mediation analysis defined in Chapter III mediation analysis.

We obtained the result that none of the regressions calculated between the variables defined to test the different models showed a significant effect. Hence we concluded that cultural capital and the generating principles related to competence and intelligence did not affect performance, and that cultural capital did not affect position taking on generating principles.

Effect of cultural capital on performance in a stereotype threat free cognitively demanding task.

Results

Given the results obtained through mediation analysis, we acknowledge that cultural capital does not induce significant differences on mental counter test performances hence, with this sample and/or with this method we cannot test any effect caused by cultural capital nor the effect of cultural capital on performance in a stereotype threat free cognitively demanding task.

Chapter discussion

The first goal we defined at the beginning of this chapter have been to confirm on a new sample the models describing the organizing principles related to competence and intelligence. We showed that the competence related model does not fit data well while intelligence fits data much better. This result could be explained by the fact that the notion of intelligence is more stable in terms of representation structure than the notion of competence. The use of the competence notion is spreading among lay people from less than 20 years, while the notion of intelligence is spreading since the beginning of XXth century. This could mean using

the Duveen and Lloyd (1990) social representations genetic framework, that the process of sociogenesis probably is not yet complete, hence the ontogenesis process could induces many different sets of generating principles, even among the same group of students. This fact could be a plausible reason explaining the inconsistencies emerging from the model confirmation process concerning the competence principles.

The second goal defined was to test the hypothesis stating that cultural capital affects performance through the abovementioned position-taking organizing principles, beyond stereotype threat. To achieve this goal we found, implemented and tested the mental counters test (Larson & Saccuzzo,1989), a research tool that on the one side gave us the possibility to manipulate the activation of stereotype threat (average answer precision) and on the other side measured a proxy of intelligence (average answer speed). We first tested predictive validity, confirming that what we measured with the mental counter test in terms of precision was compatible with a problem solving test, but we couldn't confirm that the mean response time is an intelligence proxy. Then we tested for the activation of stereotype threat measuring the self reported level of anxiety (we tested the theoretical model and showed that it fitted well our data), showing only as a tendency, without statistical significance, that the low cultural capital group of students, when facing a competence test or an intelligence test, experienced an increase in the perceived level of anxiety, feeling threatened, while high cultural capital students perceived an increase of the perceived level of anxiety only when facing a competence test. We emphasize once more that the differences are not statistically significant, and that the fact the level of self-reported anxiety is an effect of stereotype threat is yet controversial.

While analyzing the relations defined between our experimental variables, wanting to test mediation and moderation effects, we found that the level of cultural capital, is not a statistically acceptable predictor for any of the performance outcomes we defined. Looking at the data, with exploratory intent, we found a trend compatible with the activation of stereotype threat: the group of low cultural capital students perform worse at the mental counter test if we present it as an intelligence test rather than as a competence test or a pastime. As regards mediation and moderation effects, without a strong total effect they couldn't be tested.

One of the possible causes of the lack of total effect is probably due to the limited size of our sample. Another cause could be attributed to problems concerning the procedure itself. An issue could be the fact of administering the mental counter task in a group session and not individually. This fact could decrease the power of the tool because of the presence of many uncontrollable distracting sources (i.e. environmental noises).

Looking at the mediators we didn't find any difference in the positioning among groups of students differing on cultural capital level. A possible reason could be found in the fact that the psychological studies that students did before their participation to our experiment modified their original positioning (secondary socialization have modified the action of primary socialization). A second tentative reason could be that students, once reached the university studies have already been selected both at cultural capital level and at position taking principles level. In other words, all those students possessing a different kind of positioning have dropped out or terminated their studies before they could participate at our experiment. This explanation is compatible with the fact that when we tested the organizing principles with a sample of high school students, we were able to find statistically significant differences both in the effect of cultural capital on them and of them on school performance.

General discussion

The first aim of this thesis was to contribute to the understanding of how cultural capital (Bourdieu, 1983/1986) affects students achievements and performances. We specifically claimed that the effect of cultural capital is at least partly explained by the positioning students take towards the principles they use to attribute competence and intelligence. The testing of these hypothesis have been framed within the social representations theory, specifically in the formulation of the Lemanic school approach (Doise, 1986).

The first subordinate hypothesis we tested claims that competence and intelligence are perceived as different notions (Chapter I, Study I). Test for such a difference is a necessary to justify the whole research project. The results confirm that these two notions are indeed perceived as different, but not completely. In fact only 1/3 of the statements used to check this condition showed a significant difference.

The following step has been focused on the identification of the position taking principles of competence and intelligence, the cognitive content we ascribe the mediation effect between cultural capital and performance.

To achieve this goal we collected from a group of college students a set of real statements concerning the notions of competence and intelligence, and we rebuilt the representational field of the notions (consensual universe, Chapter I, Study II.a; reified universe, Chapter I, Study II.b). Then, applying a combination of content analysis methods and multivariate analysis, we identified within the representational filed the position-taking principles students use to attribute competence and intelligence (Chapter I, Study III) and identified the core position taking principles for both notions (Chapter II, Study IV; Chapter III, Study V).

The results of the computer assisted content analysis confirmed the complexity of the representational field of competence and intelligence. In fact, comparing thematic analysis output resulting from separated corpora of statements, with thematic analysis output resulting from the whole corpus elaboration, we identified seven different themes: one shared theme (Achieving results), three themes characterizing mainly competence related statements (Organizing own study, Attending classes, Using knowledge and tools) focused on specific abilities characterizing the role of student, and three themes

characterizing mainly intelligence related statements (Readiness, Cognitive effectiveness, Problem solving ability) focused on general cognitive abilities applied to student activities.

We performed also a manual content analysis using a different classification strategy, and concluded that both competence and intelligence statements describe personal psychological features, directly or indirectly (Cognitive effectiveness, Problem solving ability, Organizing own study, Attending classes), intelligence statements describe abstract personal dynamic features (Readiness), and competence statements describe abstract personal static features (Using knowledge and tools).

Exploratory factor analysis applied to the 70 items selected at the end of the manual content analysis step, identified 19 different principles (factors). After a thorough selection we isolated three principles characterizing the intelligent student (showing symbolic processing readiness, showing mnemonic readiness, organized) and two principles characterizing the competent student (diligent, self-regulated).

The difference in the content between what emerged from content analysis and what emerged from exploratory factor analysis could be ascribed, on the one side, to the manual item selection process that focused the researcher attention only on specific aspects of the semantic field, and on the other side, by the factor analysis itself, letting emerge the average group of participants perspective on the items grouping, that can potentially differ from the researcher expectation.

To balance the effect of the researcher point of view we chose to give priority to the principles emerging from factorial analysis, though recognizing a relevant difference with respect to the result emerged from content analysis.

Because of the importance of the relation between competence and intelligence, in order to explicitly consider this fact, we built a set of two principles (Chapter II, Study IV; if a student is competent then he is intelligent, if a student is intelligent then he is competent) to measure four conditions: if a student perceives competence as dependent from intelligence, intelligence as dependent from competence, exactly interchangeable notions, or as completely uncorrelated notions. As regards to the relation principles in this thesis we will focus on students position-taking differences.

Before testing our two main hypothesis on a sample of high school students (Chapter III; Study VI) we performed a first order factor analysis on the models associated to the three sets of theoretical position taking principles (competence, intelligence, relation between the two). The results show an acceptable fit for the relation competence-intelligence associated model, and for the intelligence model. The competence model is not far from being acceptable.

On the same sample of high school students we tested our thesis: cultural capital affects performance, and competence and intelligence principles mediate the effect of cultural capital on performance. We used as school performance the Math and Italian grades of the previous term, and 8th grade final exam score.

Regression analysis results shows that cultural capital significantly affects students Italian grades and students 8th grade final exam score. Cultural capital significantly affects also student position taking on the first principle related to competence (being diligent) and on both the principles for the relation (if competent then intelligent and vice versa). We registered a tendency, though not a significant effect, also for the position taking on the first intelligence related principle (showing symbolic processing readiness).

First intelligence and first competence principles significantly affect all performances measured while the second intelligence-competence relation principle only shows a tendency, though not a significant effect, in influencing students Italian grades.

Taken together these results show a tiny significant mediation effect for the competence first principle (being diligent) when considering both the effects of cultural capital on Italian grades and on 8th grade final exam score.

These results contribute to corroborate the cultural reproduction hypothesis (Bourdieu & Passeron, 1977), and is an encouraging finding, corroborating the hypothesis that position-taking principles are a means to explain the influence of cultural capital on performance.

In order to strengthen our findings we took into account one of the most studied and powerful effects explaining the action of socio economic status on student achievements: stereotype threat (Steele & Aaronson, 1995; Croizet & Millet, 2012).

We wanted to show that the effect of cultural capital on performance is not only a matter of stereotype threat, and specifically, that position-taking principles on the notions of competence and intelligence play a role in explaining this alternative effect.

In order to control for stereotype threat we created a specific experimental setting based on an adaptation of a cognitive straining task: the mental counters test (Colom et al., 2004; Larson & Saccuzzo, 1989).

Stereotype threat can be implicitly activated by means of priming words associated with the stereotype. Hence, given the stereotype "*students coming from low socio economic status families are less intelligent than students coming from high socio economic status families*" and an evaluative situation, priming the word "intelligence" will activate the stereotype threat (cf. Steele & Aaronson, 1995).

Accepting this findings we primed in our experiment the word "intelligence" to activate the threat and the word "pastime" as a neutral condition. We created also a third possibility priming the word "competence" in order to test if stereotype threat activates in this situation as well.

In order to check stereotype threat activation we used a self reported state anxiety measure (Gros et al., 2007) that we considered as a proxy of stereotype threat activation (Steele, 1997; Steele et al., 2002, pp 399, 400): stereotype threat is active if the anxiety level measured in the "pastime" condition is significantly lower than the anxiety level measured in the "intelligence" condition (showing this fact would corroborate the idea that high anxiety indicates stereotype threat activation). We expect also that the anxiety level measured in the "intelligence" condition is significantly higher than anxiety level measured in the "competence" condition, because we assume that competence, for the moment, is not associated with stereotype.

We tested our main hypotheses using this experimental device (Chapter IV, Study VII) measuring students performance both as speed (mean response time, a proxy measure of general intelligence) and as precision (percentage of correct answers).

Regarding the action of the priming (pastime, competence test, intelligence test) on performance (Speed, Precision) the factorial ANOVA analysis shows that there is no significant global effect. If we consider, only for the sake of exploration, the pairwise comparison of precision levels across presentation and cultural capital level, we find a significant average decrease in the performance for low cultural capital

students in the “intelligence” condition compared to both “competence” and “pastime” conditions, and a significant difference in performance, considering the “intelligence” condition, between low and high cultural capital students.

Regarding the action of the priming (pastime, competence test, intelligence test) on anxiety (Cognitive, Somatic), that is the internal measure indicating the activation of stereotype threat, the factorial ANOVA analysis shows that there is a significant global effect only for somatic anxiety. If we consider the pairwise comparison we identified a significant difference between the control condition (pastime) and the “competence” condition. If we consider, only for the sake of exploration, the pairwise comparison of the anxiety levels across presentation and cultural capital level, we don’t find significant differences, but we observe two tendencies: on the one side, for the low cultural capital students the level of somatic anxiety is higher in the intelligence condition than in the pastime condition; on the other side, for the low cultural capital students the level of somatic anxiety is higher in the competence condition than in the pastime condition.

Finally, addressing our main hypothesis concerning the effect of cultural capital on performance, we first showed that the competence related model does not fit well experimental data, while the intelligence model shows a slightly better statistical fit. Regression analysis points out that students cultural capital level does not influence, neither mental counter test performances, nor competence and intelligence related principles positioning. We acknowledged also that competence and intelligence related principle positioning do not significantly affect measured student performances. Hence we cannot test the more specific mediation hypothesis effect of competence and intelligence principles as causes of the action of cultural capital on performance separated from stereotype threat.

Taken together the results we obtained analyzing college students data show that the test we defined, the way we used it, and/or the choice of the sample have to be revised. In fact we haven’t been able to manipulate significantly the effect of stereotype threat. If we think of the mental counter test, considering the tendencies we have been able to find, we don’t think necessary to dismiss the whole test. It would be rather preferable to refine it trying to study the effect of changes through the number of trials, the timing of the visual stimuli, the algorithm used to calculate the scores, or the cover story. It would also be useful to associate these modifications to a stronger analysis of construct validity. if we consider the way we used the test we could change the formulation of the sentences used in priming and the priming technique. If we think of the setting it would be useful to test the effect of changing the administration of the test from collective to individual. Concerning the sample we are aware of the size issue: a bigger sample would certainly increase the power of the experiment. Beside the size we point out that we should consider also the effect of participant education content (i.e. psychology, engineering, architecture etc.) and its level (i.e. primary, secondary). In fact when we involved high school student we have been able to detect the effect of cultural capital on school performance, effect that disappeared when we considered a sample of college students and the mental counter test scores.

Talking of improvements the process implemented to identify the position taking principles related to competence and intelligence necessarily brought us to discard many alternatives. It would be useful to recall some of the alternatives not selected, in particular those based on the content analysis and include them in specific studies in order to empirically test for their properties.

Looking at perspective to the whole research work we carried out we identify four principal original products: the results of the research, a new method to study the relation linking two different notions (particularly the method described in Chapter II), the knowledge concerning the semantic structure of the competence and intelligence representational field, three sets of position taking principles (competence, intelligence and relation competence intelligence), and a configurable version of the mental counter test.
Last but not least we want to account for the title we chose for this dissertation.

The second aim of this thesis was to contribute to the debate on standardized competence testing (i.e. PISA, INVALSI, SAT). The issue arose because those tests are becoming more and more common worldwide, and their results influence both the life of the individuals directly (i.e. in Italy the INVALSI test whose score is part of the 8th grade exam final score) and the educational system (i.e. PISA has been created to inform the policy maker about the quality of educational systems). But those tests are considered by some scholars proxy measures of the general intelligence (Lynn, 2010; 2012; Rindermann, 2007).

Provided that, and being aware of the issues concerning intelligence testing (Croizet & Millet, 2012), we deliberately selected for our last study a task that could produce both a proxy measure of general intelligence (mean response time) and a more traditional measure similar to a scholastic performance (Spearman, 1904, 1927) in order to test the effect of psico-social variables. The auxiliary hypotheses to test were the following: competence priming condition does not activate stereotype threat; cultural capital affects performance level in competence test condition. If both of the hypothesis were not falsified we might claim that proxy measures of intelligence, though presented as competence test, still give an advantage to high cultural capital students and competence could have been indeed considered a wolf in sheep's clothing.

Our results (Study VII), as we stated above, show that cultural capital does not affect performance, regardless of the presentation condition, hence the answer to the question posed in the title of our dissertation have to be, for the moment, postponed.

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ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to:

My doctoral advisor and mentor, prof. Patrizia Selleri

Prof. Mariagrazia Benassi

Prof. Fabrizio Butera

Prof. Felice Francesco Carugati

dr. Elvis Mazzoni

Prof. Anne-Nelly Perret-Clermont

Prof. Luca Pietrantoni

Prof. Monica Rubini

dr. Carlo Tomasetto

I would like to say thanks to:

Chiara De Vecchi

Simone Donati,

Davide Mazzoni

Faculty of psychology IT technicians

Finally, thanks to all the women and men I have met personally

or through their writings during this unforgettable three years journey.