PERSONAL CONCEPTIONS OF INTELLIGENCE: DEFINITION, DIFFERENTIATION AND EMERGENCE AS AN ORGANIZER AND INTEGRATIVE MODEL OF OTHER MOTIVATIONAL CONSTRUCTS

Luísa Faria[1]

Abstract: This article, developing the theme of *Personal Conceptions of Intelligence*, will be approached from the perspective of four main topics: definition and characterization of the concept; development and differentiation; emergence and foundation of personal conceptions of intelligence as an organizer and integrative model of other motivational constructs; and future developments: intercultural studies.

Thus, we will present the reflections and the results of a series of studies, several of them cross-sectional and one longitudinal-sequential, conducted in the Portuguese educational context during the past 18 years, which aimed not only to present, define and delimitate the model of personal conceptions of intelligence, but also to apply, develop and transform it, both through the construction of adequate evaluation measures, by studying the specificities of the Portuguese cultural context with regard to the expression of differences, and also through the application of these results to other cultural contexts in the scope of intercultural studies.

Keywords: personal conceptions of intelligence, implicit theories, motivation, adolescence.

Concepções pessoais de inteligência: Definição, diferenciação e emergência como modelo organizador e integrador de outros constructos da motivação (Resumo): Este artigo, sobre o tema das *Concepções Pessoais de Inteligência* (CPI), está organizado em torno de quatro tópicos axiais: definição e caracterização do constructo; desenvolvimento e diferenciação das CPI; emergência e fundamentação como modelo organizador e integrador de outros constructos da motivação; e desenvolvimentos futuros: estudos interculturais.

Assim, apresentaremos as reflexões e os resultados de um conjunto de estudos, vários transversais e um longitudinal-sequencial, no contexto educativo português,

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[1] Associate Professor with Agregation. Faculdade de Psicologia e de Ciências da Educação (FPCEUP), Universidade do Porto, Rua Dr. Manuel Pereira da Silva, s/n – 4200-392 Porto, Telef. 226 079 600; Fax: 226 079 725; e-mail: lfaria@fpce.up.pt.

conduzidos ao longo dos últimos 18 anos, que visaram não apenas apresentar, definir e delimitar o modelo das concepções pessoais de inteligência, mas também aplicá-lo, desenvolvê-lo e transformá-lo, quer pela construção de medidas de avaliação adequadas e do estudo das especificidades do contexto cultural português na manifestação de diferenças no constructo, quer pela aplicação desses resultados a outros contextos culturais, no quadro de estudos interculturais.

Palavras-chave: concepções pessoais de inteligência, teorias implícitas, motivação, adolescência.

Introduction

> *Human intelligence is among the most fragile thing in nature. It doesn't take much to distract it, suppress it, or even annihilate it* (Neil Postman, 1988, cited in Aronson & Steele, 2005).

Intelligence is one of the most socially valued psychological attributes, having great relevance not only for educators, parents and students, that is, for the educational system in general, whose influence on intelligence represents an explicit objective, but also for lay people, since intelligence, throughout an individual's existence, proves itself to be a fundamental ability, particularly with regard to his or her adaptation and survival as a human being.

The very origin of Differential Psychology may be confounded with the origin of the Psychology of Intelligence, namely due to Galton′s pioneer studies on the heredity of genius and the evaluation of intelligence.

In fact, there seem to be no doubts on the importance of this construct for Psychology in general – moreover, the existence of a positive correlation between intelligence quotient (IQ) and school performance is one of the oldest contributions that are most regularly confirmed by Psychology (Reuchlin, 1991) – and also for everyday behaviours in social and professional interactions, in which one frequently evaluates and is evaluated by others from an intellectual point of view, although in most cases, not explicitly, but coherently. The consensus on intelligence ends when it comes to defining it and to establishing its origin.

In fact, various definitions and theories of intelligence have appeared, mostly within the fields of Psychology and of Education. These can be grouped in *explicit* and *implicit theories of intelligence* (Faria, 2002b; Faria

& Fontaine, 1993; Sternberg, 1985; Sternberg, Conway, Ketron, & Bernstein, 1981).

In the past, the most studied and widespread of these were explicit theories of intelligence, which represent *ensembles* of theoretical constructions of psychologists, educators and researchers. These theories are anchored in a presumably objective evaluation of intelligence, especially based on tests and similar evaluations.

In contrast, implicit theories of intelligence represent *ensembles* of beliefs – of lay people, scientists and even specific socio-professional groups, for example, teachers – regarding the nature, the development and the implications of intelligence for individuals' behaviours in the most diversified contexts of action (Dweck & Elliott, 1983; Faria, 2002b; Faria & Fontaine, 1993; Goodnow, 1980; Mugny & Carugati, 1989; Nicholls, Patashnick, & Mettetal, 1986; Vandenplas-Holper, 1987).

In this article we focus on implicit theories of intelligence. We aim to analyse the model of personal conceptions of intelligence from Dweck's socio-cognitive perspective, which highlights a group of implicit and differentiated beliefs on the nature of intellectual ability, around which achievement goals and achievement patterns of behaviour are organized, or, in other words, distinct patterns of cognition, emotion, and behaviour. We aim to demonstrate that these implicit and differentiated beliefs can play a role of interface between intelligence and motivation, since motivational factors contribute to an increase of the explanatory power of the intellectual factors in achievement situations, by focusing on the identification and on the characterization of what influences the initiation, the pursuit and the fulfilment of goal-oriented behaviours.

Accordingly, we set out to: (i) define and characterize this model, by presenting two conceptions of intelligence, implicitly and qualitatively different (*static* and *dynamic*), which promote the pursuit of different achievement goals in academic contexts; (ii) demonstrate that the adoption of a particular personal conception of intelligence is the result of a differential development process, probably influenced by certain characteristics of life-contexts; (iii) propose Dweck's model of *Personal Conceptions of Intelligence* as an organizer and integrative model, capable of bringing together, in the same conceptual framework, other similar concepts of motivation, such as achievement goals, self-concept, self-esteem, self-efficacy and attributions and causal dimensions; and (iv) extend to other cultural contexts the theoretical and empirical conclusions obtained in the Portuguese cultural context on personal conceptions of intelligence, whilst assuming the importance of adopting an intercultural perspective in the study and differentiation of the impact of dimensions of

psychological development, since the same factors of development and differentiation do not always have the same influence in all contexts.

In order to accomplish these four goals, we will present the reflections and the results of a group of studies, several of them cross-sectional and one longitudinal-sequential, conducted in the Portuguese educational context during the past 18 years. These studies aimed not only to present, define and delimit the model of personal conceptions of intelligence, but also to apply, develop and transform it, both through the construction of adequate evaluation measures, by studying the specificities of the Portuguese cultural context with regard to the manifestation of differences, and also through the application of these results to other cultural contexts in the scope of intercultural studies.

Thus, this article about the psychological construct of *Personal Conceptions of Intelligence* will also show the process of assimilation, (re)construction, application and transformation of this construct in the action-research framework, illustrating the history of an itinerary of research in Psychology, whose main stages we are now going to detail.

Definition and characterization of Personal Conceptions of Intelligence

The model of personal conceptions of intelligence is particularly important and current due to its comprehensive character, because it brings together cognitive, affective and behavioural aspects. In this way, this model is more capable of capturing the complexity of motivated behaviour in achievement situations, since motivational factors, despite being independent of intellectual ability, affect the acquisition and the development of fundamental competences in achievement contexts, in particular the academic.

Thus, research in the domain of *theories* or *personal conceptions of intelligence* includes a theoretical model anchored in two implicit and differentiated conceptions or beliefs about the nature of intellectual ability, around which *achievement goals*, *behaviours*, *affects* and *cognitions* are organized. Such conceptions of intelligence are sometimes designated as *theories*, so as to transmit the idea that the perceptions of individuals, regarding the nature of intellectual ability, are relatively systematic and coherent, being qualified as *implicit theories* because, although they may not be clearly expressed, they systematically influence behaviour and can be subjected to explicit evaluation (Cain & Dweck, 1989; Dweck, 1986, 1999; Dweck & Leggett, 1988).

More precisely, one of the conceptions, designated as *static*, involves the belief that intelligence is a global and stable trait, limited in quantity and uncontrollable. Those individuals who endorse this conception believe that they possess a fixed and specific quantity of intelligence, which can be demonstrated through their achievement, and that the results obtained are a measure of this achievement. The other conception, designated as *dynamic* and *developmental*, involves the assumption that intelligence is a dynamic group of skills and knowledge, controllable and susceptible to development through personal effort and investment (Table 1). Consequently, those individuals who adopt this conception of intelligence focus on promoting its development rather than on documenting it (Dweck & Bempechat, 1983; Faria, 1998, 2002b).

Table 1 – Characteristics of personal conceptions of intelligence

| | **Personal Conceptions of Intelligence** | |
	Static	**Dynamic**
Intelligence is:	A global and stable entity, judged by achievement results	A group of skills that can be developed through effort
Effort is:	A risk that can reveal low intelligence	An investment that enhances intelligence
Success is:	High outcome/low effort relative to others	Increases in competence relative to past performance
Errors are:	A signal of lacking competence	Information for improvement

In fact, individuals with different conceptions of intelligence seem to adopt different *achievement goals*: the static conception, by generating concerns with the personal image of competence and with the evaluating aspects of achievement, promotes the endorsement of performance *goals*, more susceptible of protecting the individual's personal image, by searching for positive judgments and by avoiding negative ones. On the contrary, the dynamic conception of intelligence, which generates concerns related to task mastery and the development of competences through personal investments and efforts, promotes the adoption of *learning goals*, more adequate for the development of personal competence and task-mastery (Dweck & Molden, 2005; Elliott & Dweck, 1988; Grant & Dweck, 2003; Table 2).

Table 2 – Personal conceptions of intelligence, goals and achievement behaviour patterns

Personal Conceptions of Intelligence	Goal Orientations	Behaviour Patterns
Static	**Performance**	**Helpless**
(Intelligence is fixed)	(Goal is to gain positive judgments/avoid negative judgments of competence)	(To avoid challenge; low persistence)
Dynamic	**Learning**	**Mastery-Oriented**
(Intelligence is malleable)	(Goal is to increase competence)	(To seek challenge that fosters learning; high persistence)

Note: Adapted from Dweck & Leggett (1988).

Finally, it should be noted that different achievement goals promote the adoption of *differentiated patterns of cognition, affect and behaviour*, designated as *achievement patterns*: performance goals are associated to *failure-oriented achievement patterns* or to *patterns of helpless behaviour*, which emphasize the accomplishment of high results with low effort in comparison to others. In this view, mistakes are considered to be proof of incompetence, and effort is regarded as threatening or a menace to personal competence. On the contrary, learning goals promote the adoption of *mastery-oriented achievement patterns* or *patterns of persistence*, which stress the increment of competence in relation to previous individual achievements; in this perspective mistakes are considered useful signals for the development of personal competence, whilst personal investment and effort are valued elements **(**Faria, 1999; Table 3).

It should be noted that by the end of basic schooling all study participants manage to perceive the fundamental aspects of both conceptions, but tend to be preferentially guided by one of them when thinking about intelligence (Dweck & Bempechat, 1983; Dweck & Elliott, 1983; Elliott & Dweck, 1988; Faria, 1998). Thus, these conceptions function as organizing constructs, determining a differentiated integration of participants' experiences in various achievement contexts and differently orientating their actions in those contexts (Fontaine & Faria, 1989).

Table 3 – Characteristics of cognition-affect-behaviour patterns

Cognition-affect-behaviour patterns (Achievement patterns)

	Helpless	**Mastery-Oriented**
Success	High results/Low effort in comparison with the others	Increasing competence in relation to past achievement
Mistakes	Signal of lacking capacity	Information useful for the development of capacity
Achievement patterns	Rigorous, rigid	Flexible, reachable
Effort	Threatening	Positively valued
Affective reactions	Proud or relief, anxiety	Excitement, enthusiasm, boredom, disappointment
Social comparison	Self-evaluative function	Used in order to acquire information regarding the best strategies of solving out the task
Chosen tasks	Those which maximize the demonstration of capacity	Those which maximize learning opportunities

Note: Adapted from Bandura & Dweck (1985).

It should also be emphasized that the relations between personal conceptions of intelligence, achievement goals and achievement patterns of behaviour have been confirmed both in laboratory and natural contexts, especially in studies conducted in the American and in the Portuguese contexts.

We highlight that the dynamic conceptions of intelligence (belief in the possibilities of developing intelligence through personal effort and investment) represent answers which make it easier to cope with failure situations, being related to more constructive interpretations and analyses regarding a more efficient way of coping with difficulties and obstacles. Thus, there is the possibility of considering them as more adaptive, and as a factor that stimulates learning (Faria, 1996).

Evaluation of Personal Conceptions of Intelligence: Past, present and future

Lately, the evaluation of personal conceptions of intelligence has undergone significant methodological advances, which reveal the interest in this perspective, and accompany the theoretical developments in the domain.

Against this backdrop, the need to construct a new instrument for the evaluation of personal conceptions of intelligence amongst Portuguese adolescents emerged due to the absence of instruments adapted to the Portuguese context. The option for constructing a new instrument, instead of translating and adapting the already existing one emerged from the fact that the latter had a reduced number of items (three), which was susceptible of increasing the "error" variance with regard to the evaluations made, as well as from the fact that it was principally addressed to early adolescents (from 10 to 12 years of age), thus not allowing the study of the development of personal conceptions of intelligence during adolescence, which represented a primordial goal for us (Faria, 1995, 1998).

The construction of this new scale went through the following steps: (i) the elaboration of a first pool of items based not only on the studies of Dweck and his colleagues on personal conceptions of intelligence and the respective consequences for the adoption and pursuit of particular achievement goals and patterns, but also on the perspective of Portuguese adolescents with regard to issues related to effort, capacity and different manifestations of competence, all these being evaluated through individual semi-structured interviews (Table 4); (ii) a study of spoken reflection, which served to evaluate the significance and the relevance of the items for the participants within a face-to-face situation, and allowed for the introduction of formal changes with regard to words and expressions of the questionnaire, as well as to its form; and, (iii) a first study of psychometrical qualities, which assessed a version of the instrument resulting from the two previous phases, with 26 mixed items (15 of the "static" conception and 11 of the "dynamic" conception), evaluated on a 6-point *Likert* scale (from "total agreement" to "total disagreement", on which the "dynamic" or "not static" aspect corresponds to the superior scoring), with a sample of 222 5th to 11th graders, of both sexes and of high and low socio-economic statuses (SES), from different schools in the city of Porto.

This last study assessed reliability (using Cronbach's alpha coefficient) factorial validity (principal components analysis with varimax rotation), and the discriminative power of the items. Thus, the alpha coefficient for the global scale was of .78, and the one for the "static" scale was higher (.82) than that of the "dynamic" scale (.76). Furthermore, the

principal components analysis revealed the existence of two distinct factors, one "dynamic" and the other "static". Finally, the discriminative power of the "static" items proved superior to that of the "dynamic" items.

Table 4 – Themes developed by at least 70% of the subjects during semi-structured interviews

- The importance of effort in the school context

- Relation between capacity and effort

- Characterization of the "good student"

- Distinction between intelligence and smartness

- Situations in which adolescents felt intelligent and capable

- Role of "mistakes": form of learning *vs*. signal of incompetence

- Strategies adopted in order to avoid demonstrating incompetence in the school context

- Comparison of one's own achievement with the one of others

- Meaning of "bad achievement results"

- Development of intelligence: potentialities and limits

Note: Adapted from Faria (1990).

This new scale, constructed in and for the Portuguese context, resulted from the systematic interaction between theoretical assumptions and practical facts. It is necessary to stress the fact that the evaluation of the psychometric qualities indicated their reliability and sensitivity for the evaluation of the personal conceptions of intelligence of young students attending the 5th to the 11th grades, as well as its factorial validity, which revealed the potentialities of this new scale as regards the elaboration of an explicative conceptual framework of the differential development of personal conceptions of intelligence during adolescence (Faria, 1995).

The psychometric qualities of the *Personal Conceptions of Intelligence Scale* were recently reassessed (Faria, 2003), through the study of the internal consistency of the subscales and the total scale, the factorial validity of the total scale, the internal validity of the items, the sensitivity of the scales and the discriminative power of the items, with a total sample of 730 students, 380 senior high-school and 350 college students, and it

continues to show good psychometric qualities. The current results appear to be similar to those obtained in previous studies in the Portuguese educational context. Thus, the internal consistency, as indicated by Cronbach's alpha, was higher than .80 for the two subscales and for the total scale, confirming the homogeneity of the items that compose the scale. In fact, the results of the internal validity index of the items indicate that these correlate positively and significantly with the scale, consistently representing the construct. The results of the factorial analysis point to a two-factor structure, similar to those previously obtained, and explain slightly less than 40% of the total variance of the results, factor 1 being predominantly loaded by dynamic items and factor 2 only by static items.

The results of sensitivity and discriminative power studies indicate that the normal distribution of the results is unquestionable and that the extreme answer alternative choices is avoided by individuals, the dynamic items presenting, as had already been observed, less balanced choices with regard to the various answer alternatives and a general tendency of agreement with the items.

Finally, the university sample shows greater capability of differentiating between the dynamic and static aspects of intelligence. This was noticeable both from the observation of the discriminative power of the items and from the correlations observed between the subscales in the case of this sample. Thus, these students, who are also older and have been evaluated for the first time with this instrument, seem to be more capable of distinguishing and appreciating the dynamic and static aspects of intelligence as integrating the same construct.

To sum up, the results of this study evidenced the possibility of continuing and even extending the use of the *Personal Conceptions of Intelligence Scale* (PCIS) to the university context, since this seems to be a particularly fertile ground that challenges intellectual capacity and the personal conceptions of intelligence and mastery of individuals.

Even more recently, several confirmatory factor analyses using samples from several cultural contexts (Portuguese, Romanian, Italian, and North-American), indicated the possibility of refining the scale. One of the examples of this cross-cultural validation of the scale is given by the preliminary results obtained from the comparison between the Portuguese and the Romanian contexts (Ciochina & Faria, 2006), as shown in Figs. 1 and 2, and in Tables 5, 6 and 7.
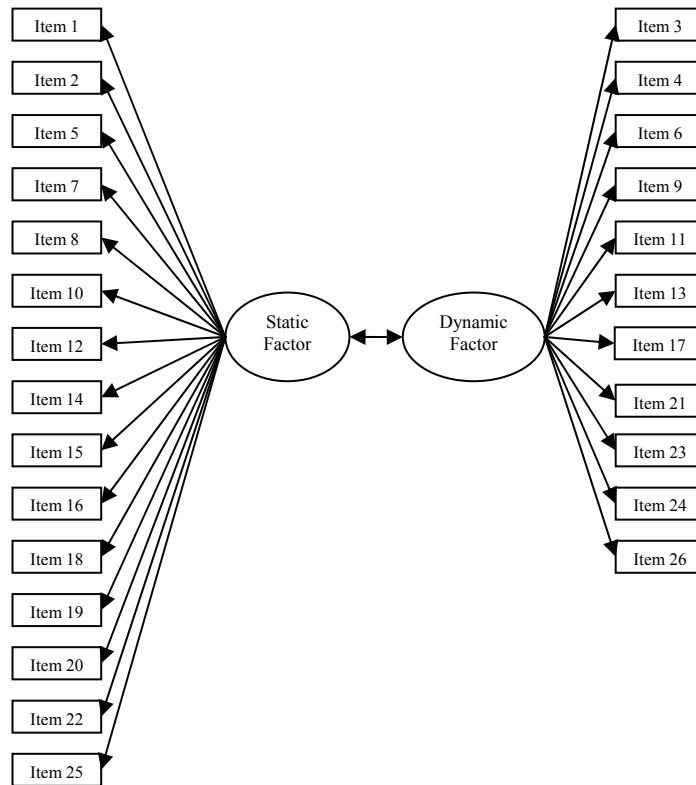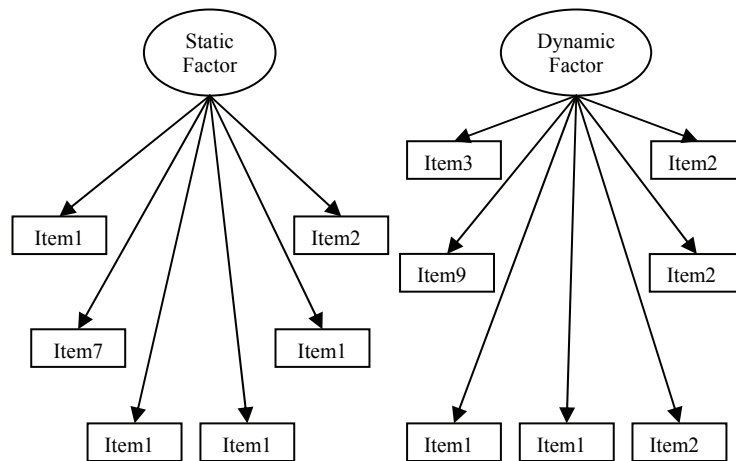
Figure 1 – Theoretical model for the PCIS

These results highlight that those items eliminated in the *reconfigured model* refer to aspects concerning success, failure, challenges and drawbacks in their relations to the dynamic or static aspects of intelligence, while those items that were maintained refer only to the static or dynamic aspects of intelligence and participants' role in its development (without any reference to individual or school factors), which were probably less affected by ambiguity.

(Adapted from Ciochina & Faria, 2006)

Figure 2 – Reconfigured model for the PCIS

Table 5 – Indexes of adjustment for the theoretical and reconfigured models in the Portuguese and Romanian samples

	Portuguese sample ($N = 138$)					Romanian sample ($N = 115$)				
	χ^2	*df*	*CFI*	*RMR*	*RMSEA*	χ^2	*df*	*CFI*	*RMR*	*RMSEA*
Theoretical Model	613,70	298	0,68	0,15	0,09	647,86	298	0,59	0,12	0,10
Reconfigured Model	107,87	64	0,93	0,07	0,07	88,84	64	0,94	0,07	0,05

Note: Adapted from Ciochina & Faria (2006).

Table 6 –   Indexes of adjustment for each factor of the reconfigured model in the
Portuguese and Romanian samples

	Portuguese sample ($N = 138$)					Romanian sample ($N = 115$)				
	χ^2	df	CFI	RMR	RMSEA	χ^2	df	CFI	RMR	RMSEA
Static Factor	16,51	9	0,97	0,06	0,07	15,85	9	0,97	0,06	0,08
Dynamic Factor	33,74	13	0,92	0,08	0,05	25,45	14	0,94	0,05	0,08

Note: Adapted from Ciochina & Faria (2006).

Table 7 – *Indexes of adjustment for the reconfigured model after the analysis of
metric invariance*

	Sample (*Npo* = 138, *Nro* = 115)				
	χ^2	df	CFI	RMR	RMSEA
Equal saturations	232,14	140	0,91	0,13	0,05
Equal correlations between factors	236,31	141	0,91	0,15	0,05
Equal error-variances	299,17	154	0,87	0,16	0,06

Note: Adapted from Ciochina & Faria (2006).

Development and differentiation of Personal Conceptions of Intelligence

The endorsement of a particular personal conception of intelligence is the result of a process of differential development, which is probably influenced by certain characteristics of the life contexts to which individuals belong. Thus, in various studies conducted in the Portuguese context, the differences in *age/school* grade are presented as elements of "evaluation" of the developmental transformations, whereas the differences in gender and socio-economic status (SES) are considered as "differentiation" elements of life contexts (Faria, 1998), since factors such as gender and SES determine

the values, the norms, the patterns of excellence and the type of experiences to which individuals are more frequently exposed in various domains of action and interaction.

Cross-sectional and longitudinal studies in the Portuguese context

Age/school grade

Various cross-sectional studies conducted in the Portuguese context with adolescents, have shown that there is an evolution of personal conceptions of intelligence in a progressively more dynamic direction (Faria, 1990, 1998). The absence of other results regarding the evolution of personal conceptions of intelligence during adolescence, especially in the American context, led us to explore possible explanations in order to grasp the results observed in the Portuguese context.

In fact, the observation of interaction effects between school grade and SES, in the Portuguese context (Fig. 3; Faria, 1998), led us to formulate and test the hypothesis according to which, during adolescence, the school context would have a homogenizing effect on the development of personal conceptions of intelligence, since the development of this variable as a function of age/school grade was seen to be more intense when its initial values were lower, so that the clear differences observed in the 5th Grade (11 year-olds), between participants of different SES, tend to disappear in the 11th Grade (17 year-olds).

However, as cross-sectional studies confound age and cohort effects, it was not possible to observe the differences in the way the changes had occurred (Faria, 1996). The development of personal conceptions of intelligence, along with school grades, should be studied in the framework of a longitudinal investigation, proceeding from two alternative hypotheses: (i) the development of progressively more dynamic conceptions of intelligence is due to the homogeneity effect of school, which leads to the progressive and systematic endorsement of these more dynamic representations; or (ii) the selection of the participants with more dynamic conceptions of intelligence is due to the uniformity effect of school, which operates through the selective drop-out of the students with more static conceptions. In this framework, it is also to be foreseen that these two alternative hypotheses may act or not simultaneously (Faria, 1990, 1996, 1998).
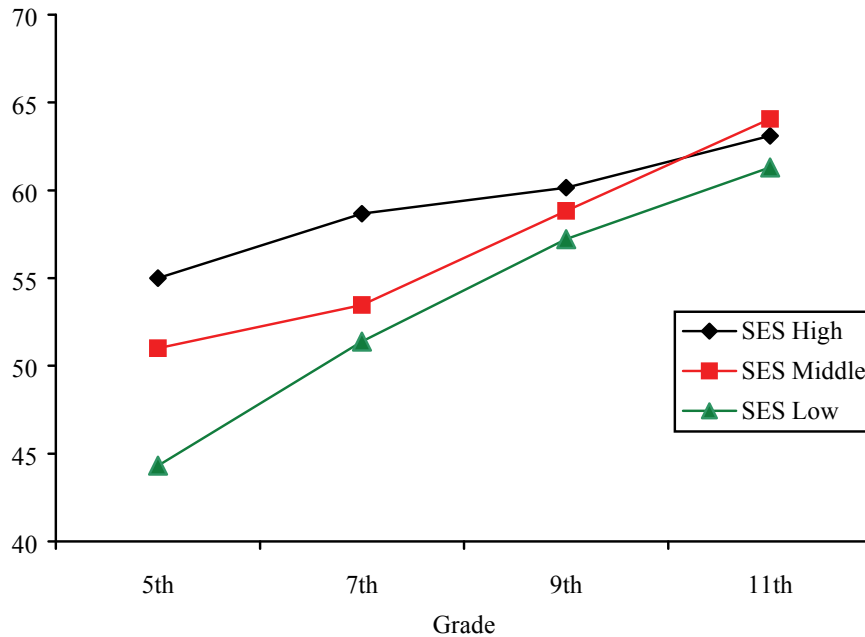
Note: Minimum possible score 15; maximum possible score 90.

Figure 3 – Personal conceptions of intelligence by school grade and SES

The longitudinal study, proceeding from the two hypotheses mention-ed above, was developed within a longitudinal-sequential design, with a two-year interval and with a sample of 1,529 students, from the 5th to the 11th school grades. It revealed the absence of any kind of temporal evolution of personal conceptions of intelligence, as well as the lack of any significant influence of inter-individual differentiation factors, such as school grade, gender and SES on intra-individual development (Faria, 1996, 1998).

To understand why any kind of intra-individual evolution was absent, we analysed the differences in personal conceptions of intelligence between "lost" students from the first to the second wave of the study and students who remained in the study. These analyses are justified by the phenomenon of selective loss of participants between the first and the second wave of the study, with a higher incidence of low SES participants. Results indicated that there was a selective loss of the participants with more static conceptions of intelligence. This confirmed the hypothesis of the general-ization of the progressively more dynamic conceptions of intelligence due to the uniformity effect of school, which operates in terms of the selection

of students with more dynamic conceptions and determines the selective drop-out of those students with more static conceptions. In fact, the students who could potentially have progressed more were lost from the system, whilst those who remained would probably not have undergone great evolutionary changes in their personal conceptions of intelligence. This explains the absence of intra-individual differences between the two waves of the longitudinal-sequential study.

Thus, school seems to have provided no experiences susceptible to promote dynamic personal conceptions of intelligence of students, its role being limited, on one hand, to favouring and requiring this type of conception and, on the other hand, to penalizing the participants with more static conceptions; participants who focused more on results and social comparison were consequently more preoccupied in obtaining favourable evaluations and in avoiding negative judgments of their competence (Faria, 1996, 1998).

Contrary to what had been foreseen, starting from the differential results of studies with cross-sectional design, as a function of the school grade, gender and SES, the results of the longitudinal-sequential study showed a certain stability of personal conceptions of intelligence along time, in various life contexts. A close analysis of the "lost" participants, in the course of the longitudinal study, indicated that these participants appear more static: this result seems to illustrate the normalizing role of school which, as a place where social norms are learned, can determine criteria for the evaluation of intelligence and normality and, consequently, can reward or punish behaviours, as a function of their greater or lesser adaptation to immediate demands (Faria, 1998).

Thus, the results obtained sustain the need to introduce deliberate psychological intervention in the school context, namely in the sense of promoting more adaptive conceptions of intelligence, since school, in itself, does not seem to represent a context which promotes and develops dynamic conceptions of intelligence (Faria, 1996, 1998).

Gender

In the American context, research shows that there are gender differences in personal conceptions of intelligence, suggesting that females endorse more static conceptions than males (Licht & Dweck, 1984; Licht, Linden, Brown, & Sexton, 1984; Leggett, 1985). This led us to conduct a group of studies to test this hypothesis in the Portuguese context. Our results suggest there are cultural particularities, since both cross-sectional and longitudinal-sequential studies showed no significant differences between boys and girls in their personal conceptions of intelligence (Faria, 1998, 2002a). Future research must still explore whether in the Portuguese

culture women assume a less traditional role and whether schooling and professional success for women are supported more in the Portuguese than in the American culture because success is not stereotypically attributed to male role norms.

The massive number of Portuguese women who entered both the labour market and all levels of education, especially university, might be associated with these changes (Barreto, 1996). This could also have raised standards of achievement for women (Faria, 1998, 2002a; Lobel & Bempechat, 1992). Perhaps the investment in academic and professional success by women is not only desirable but also compatible with the social roles attributed to women in the Portuguese culture. It is not unpopular for women to assume a more salient role, even if such a role is traditionally considered to be typically masculine (Lobel & Bempechat, 1992).

It also seems important to explore different contexts of development, such as how parents' and teachers' social representations of the value of success, intelligence, and competence in general influence boys and girls. Also important is the evaluation of the effect of such social representations on the educational practices related to independence, autonomy, and achievement of both sexes and of the teachers and their teaching methods for boys and girls. Analysis of the compatibility of the social represent-ations of Portuguese parents and teachers, concerning intelligence, success, and competence with the more traditional views of male and female social roles requires study and might indicate a change from the traditional connotation of these qualities with male roles in the Portuguese context (Faria, 2002a).

Besides, one important challenge in this domain will be to consider the study of gender interactions rather than studying main effects of gender (Hyde & Durik, 2005). For example, are static conceptions and performance goals more beneficial for men than for women? This line of research could be very beneficial for the domain..

Socioeconomic status (SES)

Research on personal conceptions of intelligence reveals the absence of studies comparing this attribute as a function of the individual's SES. Nevertheless, in the Portuguese context, the results of several cross--sectional studies are stable, stressing differences always favourable for the individuals from higher SES (and sometimes from medium SES), who appear to be more dynamic (Faria, 1996). On the other hand, we observed in the longitudinal-sequential study in the Portuguese context a selective loss of those students with more static conceptions of intelligence, in such a way that the various SES samples became more similar at the end of the study (Faria, 1998).

In order to explain these results, we advanced some exploratory hypotheses, which are based on the analysis of the social background of the low SES individuals, namely the lack of opportunities for social climbing, which can lead the participants to endorse static conceptions of several attributes including intelligence, through social learning mechanisms (Faria, 1996).

Exposure to poverty and disadvantage may lead to helpless, diminished expectations for the future and low perceived competence, fostering negative and static interpretations of attributes and events (Brooks-Gun, Linver, & Fauth, 2005).

To sum up, we can assert that the hypothesis that personal concepttions of intelligence undergo a process of differential development influenced by the characteristics of life contexts has been supported, at least in the Portuguese context, by a wide range of empirical evidence.

Emergence and foundation of Personal Conceptions of Intelligence as an organizer and integrative model of other constructs of motivation

According to Bergen and Dweck (1989), the 'ideal' model of motivation should: (a) organize complex phenomena in such a way that these can be readily identified and perceived; (b) 'explain' behaviour, that is, present the reasons and the causes of its occurrence; (c) predict behaviour; (d) supply ideas and incentives for research. In other words, a comprehensive and explanatory model should tell what is happening, why this is happening, what will happen next and in what way it is possible to find out more about the phenomenon. It seems that the model of personal conceptions of intelligence brings together some of these characteristics, shaping itself and emerging as an organizer and integrative model of various constructs in the motivational domain.

According to Fontaine and Faria (1989), personal theories or conceptions of success represent ensembles of *personal beliefs and interpretations*, which are part of a range of "implicit individual theories to which everyone resorts in order to understand, explain and predict the occurrence of success or failure" (p. 5).

In fact, personal conceptions, as organized and organizer "meaning systems" of beliefs with regard to various personal attributes, among which intelligence, comprise the manner in which individuals perceive themselves and perceive what surrounds them in competence-relevant situations (Dweck & Molden, 2005). Consequently, these conceptions integrate, influence, attract or highlight other personal constructs, such as achievement

goals, self-concept, self-esteem, self-efficacy and attributions and causal dimensions.

With regard to personal conceptions of intelligence, Dweck (1991) asserts that these can be considered as two qualitatively different self-systems, representing two distinct forms of conceiving *self-concept* – one static and the other dynamic –, so that the static conception conceives the *self* as a group of static traits, a perception which leads the individual to pursue performance goals in order to protect his/her self-esteem or his/her feeling of personal competence, whereas in the dynamic conception, the individual perceives the *self* as a series of characteristics and attributes susceptible of development, through his/her own actions, which leads to the pursuit of learning goals so as to maintain and promote feelings of personal competence and personal value.

This being the case, we can say that personal conceptions about the nature of intellectual ability affect the construction and the development of the self-concept, as well as the type of mechanisms responsible for the maintenance of *self-esteem*. They also influence and determine, on one hand, the construction of *self-efficacy expectancies* (although indirectly, through self-concept), since a part of them are founded on the perception of personal competences and, on the other hand, the manifestation of certain types of causal attributions. This is because the belief in the higher or lower flexibility of intellectual ability affects the way in which participants explain their level of success, especially with regard to the perceptions of stability and controllability of the causes (causal dimension). These results have already been demonstrated in the Portuguese context (Faria, 1998).

Thus, personal conceptions of intelligence seem to emerge as capable of organizing and integrating, in the same conceptual framework, similar constructs of motivation, allowing the elaboration of a larger conceptual scheme, more adequate for the understanding and explanation of the development of motivation in achievement contexts. In the same way, such a model will open new lines of research, stimulating its use in other cultural contexts.

Development of a model for conceptual integration

The notion of competence seems to incorporate a series of personal constructs that involve *perceptions*, *feelings*, *beliefs*, *representations* and *evaluations* about ourselves and our achievement. All these "personal interpretations" together seem to allow the construction of a model that analyses and explains the notion of personal competence in an integrated and comprehensive form, allowing the construction of a model of *personal*

conceptions of competence, in which the notion of competence is represented in a broad sense, through the integration of a series of constructs related to achievement motivation, especially those regarding *attributions* and *causal dimensions*, *personal conceptions of intelligence*, *self-concept* and *self-efficacy*.

In fact, all these concepts refer to motivational factors and processes, thus being possible to conceptualise them in the framework of the more global personal and implicit theories or conceptions, regarding personal competence and possibilities of success in achievement contexts: (i) *attributions* and *causal dimensions* can be considered as manifestations of these conceptions, since the accumulation of achievement experiences leads to the structuring and the development of organized and differentiated patterns and styles of attribution of success and failure (Faria, 1998; Fontaine & Faria, 1989; Weiner, 1985); (ii) in turn, personal conceptions of intelligence represent *implicit theories* or *self-meaning systems*, since they are based on personal beliefs regarding the nature, more or less incremental, of intellectual ability (Dweck, 1999; Dweck & Leggett, 2000); (iii) as regards *self-concept*, it should be mentioned that it involves perceptions regarding personal abilities in various domains (Covington, 1992; Harter, 1985, 1990; Marsh, Byrne, & Shavelson, 1988; Shavelson & Bolus, 1982); (iv) finally, *self-efficacy* concerns expectations and feelings regarding personal efficacy, related to the self-concept itself, and also involves perceptions about personal competence and mastery (Bandura, 1977; Maddux, 1995).

At the conceptual and empirical level, several authors have studied the relations between these four constructs, contributing to a more comprehensive approach of the motivational processes that underlie them (Pina Neves & Faria, 2005). As concerns personal conceptions of intelligence, Dweck and Leggett (2000) consider that they can be conceptualised as two distinct self-systems, standing for two different forms of conceiving self-concept: one static and the other dynamic. In the framework of a system of static conceptions, a person perceives the *self* as a series of fixed and stable traits, a perception that leads him/her to pursuit goals focused on results so as to protect his/her self-esteem and personal competence. On the contrary, in the framework of a system of dynamic conceptions, the person perceives the *self* as an amount of characteristics and attributes susceptible of development, through his/her own actions and experiences, leading him/her to pursuit learning goals as a way of maintaining and promoting his/her feelings of personal competence and value. This suggests that personal conceptions on the nature of intellectual capacity affect the construction and the development of the self-concept, as well as the mechanisms responsible for maintaining self-esteem.

Thus, we can state that personal conceptions, viewed as organized and organizing meaning systems of beliefs about personal attributes (including intelligence), and which represent a comprehensive extended construct about the manner in which individuals perceive the world and themselves, influence other personal constructs. Thus, in the framework here presented, personal conceptions of intelligence precede the structuring of the other three analysed constructs, that is, self-concept, self-efficacy and attributions and causal dimensions (Fig. 4).

The relation between self-concept and self-efficacy can be easily identified, since, as we have already mentioned, expectations about personal efficacy are based on the perception that the individual has about his/her competence in achieving success in a particular context (Pajares, 1997; Pajares & Schunk, 2000). Thus, on the one hand, self-efficacy is based on the perception of personal competence, but, on the other hand, it is a construct independent of the self-concept, since, although there are some who consider it as a dimension of the self-concept, it is closely related to specific achievement situations and previous concrete achievement experiences. In this way, the self-concept influences the construction of self-efficacy, as well as of its underlying expectations. Thus, we can suggest that personal conceptions of intelligence, through their relation with the self-concept, indirectly influence the feeling and the expectations of personal efficacy (Fig. 4 – lines 1 and 2).

At the same time we can suggest a relation between the self-concept and attributions and causal dimensions (Fig. 4 – line 3), since the way in which we perceive and evaluate our competence and our actions (that is, the extent to which we consider ourselves competent and ’diligent ’/’hard-working’), can influence our explanations for our achievements, especially when we attribute them to causes such as capacity or effort. In this framework, contrary to what happens with self-efficacy, personal conceptions of intelligence would directly influence attributions and causal dimensions (Fig. 4 – line 4), since perceptions of intelligence, as a more or less dynamic attribute, can affect the perception of the stability and controllability of causes such as capacity and effort. This direct causal relation has already been demonstrated by research in the Portuguese context (Faria, 1998).
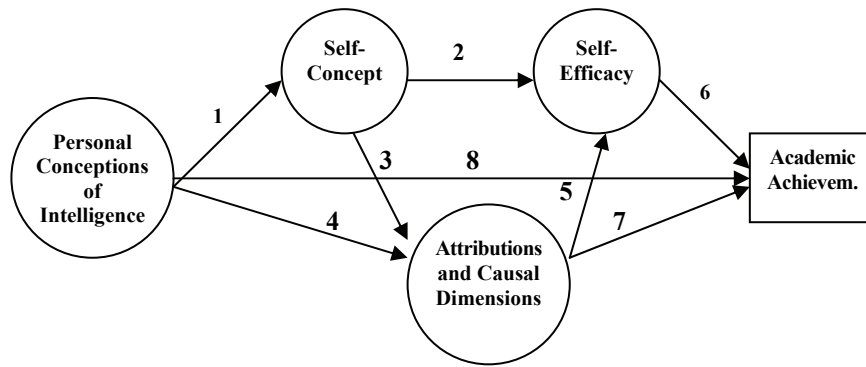
(Adapted from Pina Neves & Faria, 2005)

Figure 4 – Personal conceptions of intelligence as an organizer and integrative model

As for the relation between causal attributions and self-efficacy (Fig. 4 – line 5), several studies show that the expectations of being efficient in the academic domain depend not only on the perception of personal competence and on the characteristics of the achievement situation, but also on the causes that are attributed to success and to failure, as well as on the way in which these causes are perceived and classified into dimensions (Schunk, 1981, 1982, 1983). The type of attributions represents one of the ways in which students estimate their efficacy in a particular domain and develop success expectations for their achievement in this domain. Thus, attributions indirectly influence achievement through the expectations of personal efficacy, the latter influencing achievement in a more direct way (Schunk, 1991).

At this point we can say that attributions and self-efficacy, although related to the self-concept, and even to conceptions of intelligence, must be seen as constructs more proximal and more applied to specific domains of achievement, since they develop as a function of previous results and of the success and failure of experiences, providing information either about the achievement situations or about the students' capacity for acting, mastering and dealing (in terms of control and regulation) with the social context and the achievement situations.

Similarly, Skinner (1996) considers that constructs such as causal attributions, self-efficacy and even the perception of personal competence can be seen in the light of a larger conceptual system concerning perceived

control, considering that, on one hand, expectations of personal efficacy and perceptions of competence refer to evaluations constructed around the individual (agent) and offer information about the strategies of action and control of the action (means), more adequate to achievement (*agent-means relations*) and that, on the other hand, the causal attributions refer to connections established between certain causes and certain results (*means-ends relations*). Thus, the attributions and the causal dimensions would also directly influence the school results (Fig. 4 – line 7), as the attributional perspective of Weiner postulates (Weiner, 1985), and personal conceptions of intelligence would directly influence achievement (Fig. 4 – line 8), as already confirmed in the Portuguese context (Faria, 1998).

Finally, it is important to point out that the model here presented represents merely a first suggestion of integration of the constructs analysed, illustrating possible relations and taking on the character of an orientation for future studies in this domain. Several studies are currently underway, in order to test this model (Pina Neves & Faria, 2003, 2005).

Future developments: Extension to other cultural contexts

> "Cultures are diverse and dynamic social systems not static monoliths." (Bandura, 2002, p. 275, cited in Chiu & Hong, 2005).

Implicit theories of intelligence have proved to be very important, since they influence individuals' thinking and action, especially in achievement contexts, affecting the choice of achievement goals, the causal attributions for success and failure, the efficacy of achievement and the way in which it is interpreted; thus directing future achievement and expectations (Little & Lopez, 1997). However, their influence will probably not be the same in several cultural contexts, as the studies on the differential development of personal conceptions of intelligence in the Portuguese context have shown in comparison with the results from the American context.

In fact, implicit theories represent a domain in which it is possible to observe the effects of the socio-cultural context to which the individual belongs, as a result of the fact that these conceptions have a double function: "constructing a group of explanations, mentally plausible and coherent at the individual level and, at the same time, constructing a gratifying social and personal identity" (Faria, 2002b, p. 94). One should observe that the theories of lay or common people seem to be more

comprehensive than those of experts, comprising in the definitions of intelligence motivational aspects – persistence –, social aspects – social competences –, and emotional aspects – emotional stability (Furnham, Shahidi, & Baluch, 2002), which allows them to be applied to larger and more diversified contexts of action.

We can also observe that the development of intelligence, socially interpreted as a fundamental and valuable human resource, "requires the incorporation of social values and norms, which establish the criteria of success and failure, as well as the distribution of reinforcements or punishments. Consequently, it cannot be conceived independently of the social values and of the objectives of culture, in general, and of school, in particular" (Faria, 2002b, p. 102).

Thus, individuals from different cultures have been submitted to differentiated socialization practices, which lead them to endorse diverse beliefs, values, expectations and norms. It is thus expected that they value differently socially relevant attributes, such as intelligence, or achievement results (Salili, 1994).

Thus, in Western cultures, generally speaking, more individualistic, personal achievement and competition are emphasized, and success obtained through personal investment, mastery and effort is valued, since individuals have a feeling of self-reliance, which implies that personal and internal attributes are main determinants of behaviour, including in this definition cognitive resources as intelligence (Boekaerts, Pintrich, & Zeidner, 2000; Henderson, Marx, & Kim, 1999; Hui, 1988, cited in Salili, 1994; Somech, 2000; Triandis, Bontempo, & Villareal, 1998).

In contrast, non-Western cultures, which are generally less individualistic, value and stimulate cooperation, reciprocal encouragement and interdependence as success-promoting factors. In this perspective, the feeling of belonging to collective social groups or institutions that protect and stimulate individuals in exchange for their devotion and loyalty is valued, and behaviour is largely regulated by in-group norms (Boekaerts, Pintrich, & Zeidner, 2000; Hui, 1988, cited in Salili, 1994; Somech, 2000; Triandis, Bontempo, & Villareal, 1998).

In fact, Western and non-Western individuals may display the same achievement behaviours, but with different underlying purposes and achievement goals.

Portugal and Italy suit the definition of societies where there seems to exist a direct relation between economic enrichment and individualism, in Hofstede's perspective, because "the countries which reached a rapid economic development faced a movement towards individualism" (Hofstede, 1997: 98). Nevertheless, despite the high convergence to indi-

vidualism, due to economic progress, there are still different relations between the individual and the group in these western countries.

Empirical evidence in two Southern cultures: Portugal and Italy

More precisely, Portugal and Italy, as Southern European countries, display some similarities, but also some historical, cultural, economic and educational particularities, which may alter the development and the differentiation of a socially relevant attribute, such as intelligence, even if they both integrate individualistic Western cultures and have social and educational systems characterized by competitive pressure and by individual struggle for success and excellency.

Recent cross-sectional studies developed in Portugal and Italy have shown the existence of a similar and parallel evolution of personal conceptions of intelligence, in a progressively dynamic sense (Alesi, 2003; Faria, 1998; Pepi & Alesi, 2005). Therefore, a comparative study between Portuguese and Italian samples could offer the opportunity of gaining thorough insight into some of the developmental and differential manifestations of personal conceptions of intelligence, as we are going to see next.

The studies conducted in the Portuguese cultural context highlight the penalizing role of school which has led to the selection of the students with more dynamic conceptions of intelligence and to the "punishment", through the absence of progress in the school system or even drop-out, of those with more static conceptions. These studies also emphasized the presence of cultural particularities such as the absence of gender differences, in contrast to the results obtained in the American context. They also replicate classic differences favouring the high socio-economic classes.

On the other hand, in the Italian context, the evolution of personal conceptions of intelligence with age in the direction of a dynamic conception, the absence of gender differences and the social class differences favouring the higher classes (Alesi, 2003; Pepi & Alesi, 2005), exactly as in the Portuguese context, have emphasized the importance of considering thoroughly some of the developmental and differential manifestations of personal conceptions of intelligence, especially because the studies conducted in this cultural context have only been cross-sectional.

In this framework, it appeared important to conduct studies comparing the personal conceptions of intelligence between the two cultures, surrendering a view of universal the processes of differential development

which occurred in one culture and using instruments adapted to the studied cultures, with the aim of observing if the same factors (school grade, gender and SES) will have the same effects on the same psychological construct in two distinct cultures.

The main results of this intercultural study emphasize the existence of significant interaction effects between the level of education and the cultural context, showing that, on one hand, Italian secondary school students have less static conceptions of intelligence when compared to the remaining groups (Portuguese secondary and university students and Italian university students), and, on the other hand, the absence of gender differences in personal conceptions of intelligence, contrary to the American context, suggest similarities between Portugal and Italy regarding the non-differentiation of personal conceptions of intelligence as a function of gender (Faria, Pepi, & Alesi, 2004; Pepi, Faria, & Alesi, 2004).

These results may be explained in the light of the particularities of the educational systems of both countries, requiring further research: in fact, the aspects in which both cultures differ require subsequent identification and evaluation, especially in terms of investigating the socio-cultural basis of personal conceptions of intelligence, representing future challenges for research in this domain.

In a preliminary analysis, these results may be attributed to the particularities of the Italian secondary educational level, in which access to university is promoted, particularly in the South of Italy, not being dependent on *numerus clausus* as in Portugal, because university stands as a period of moratorium designed to postpone the entrance into the labour market, where there is a high youth unemployment rate.

As a result of this, we can speculate that, at the end of the secondary level, the Italian students prepare themselves to either face the labour market challenges or continue their studies at the university; these conditions may explain the expression of less static conceptions of intelligence at the end of this educational level.

On the contrary, secondary-school Portuguese students face difficulties in entering university because of a *numerus clausus* process dependent on final grades at the secondary level**.** Being subjected to competitive pressure and anxiety, admission to university often represents an objective in itself. It is only later on, when leaving university, that they encounter obstacles entering the labour market. These aspects may explain the more static conceptions of intelligence observed during the secondary level.

Meanwhile, further research is needed for a cautious exploration of these results and a better understanding of the interaction effects observed between educational level and cultural context. Further studies should

highlight how cultural practices, meanings, and psychological processes depend on each other.

Final remarks: The role of school in promoting more adaptive and developmental Personal Conceptions of Intelligence

The importance of personal conceptions of intelligence results from the fact that, in achievement contexts, individuals' actions do not depend only on their objective intellectual capacity, but also on self-meaning systems about intellectual ability, as well as by their perceptions of the relations between capacity and effort when it comes to explaining the achievement results.

Nevertheless, one should also mention that the varied and distinct socialization experiences in various life contexts emphasize the need for adopting another perspective, which replaces the study of stable traits with the study of motivational processes, as well as the individual point of view with that of the interaction of the individual with the social context (Faria, 1998).

In fact, the social position of a person can influence the conception of intelligence that he/she has. Just to give an example, one should stress the case of teachers, for whom the notion of intelligence emerges as a heterogeneous and conflictive social representation (Faria & Fontaine, 1993; Mugny & Carugati, 1989).

Thus, it seems to be important to promote in students more dynamic conceptions of intelligence, since these allow one to conceive the development of effort in a parallel and complementary way to the development of capacity and, emphasizing the active role of participants in this process, they allow one to conciliate the investment in achievement results with the development of intellectual capacity through learning and effort (Faria, 1998).

Thus, considering this global framework, we can suggest some generic proposals for psychological intervention, which assume that competence is both fragile and responsive to intervention (Aronson & Steele, 2005). From the very beginning of confrontation experiences with learning and achievement processes in the context of school, this psychological intervention should have as objectives: (i) to develop and assign academic tasks and activities that are personally meaningful and relevant for students, and also moderately challenging (Urdan & Turner, 2005); (ii) to promote a diversified analysis of the explanations of achievement, successes and failures; (iii) to facilitate the analysis of the recognition of the contingency between achievement behaviours and results

so as to increase the perceptions of control over achievement and to facilitate action, thus promoting the sense of personal competence; (iv) to provide students with supportive and informative feedback about task requirements and effective strategies in settings that emphasize the value of acquiring knowledge and understanding of the world and the self (Butler, 2005); (v) to promote the complementary nature of causes, such as effort, capacity and knowledge, in the explanation of the results obtained in the school context (effort intensifies capacity and facilitates learning and knowledge); (vi) to promote school strategies focused on mastery since, through these, the person receives important information concerning the progress made in his/her achievement, thus facilitating the emphasis on the process and the value of effort; (vii) to promote the value of learning improvement and the individual's belief in the efficacy of effort; (viii) to promote the development of capacities that would facilitate the integration of aspects of both conceptions, static and dynamic, that is, highlighting and coordinating the recognition of differences in the a person's various capacities, thus emphasizing the development and the progress of such capacities; (ix) to make teachers sensitive, since their initial training, to the importance of personal conceptions of intelligence held by students and by teachers themselves, as well as to the way in which such conceptions affect the individuals' actions and their relations with others.

Nevertheless, one should mention that these intervention strategies cannot be pursued independently of the social context in which they occur, since the changes at the individual level will only be productive if they have correspondence at the socio-cultural level (Weiner, 1990).

To conclude, the importance of implicit theories of intelligence is founded on and distributed through the double function of constructing a set of plausible and coherent explanations at the individual level alongside with constructing a gratifying social and personal identity.

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