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## Social Intelligence in Portuguese Students: Differences According to the School Grade

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### Abstract

This study aims to present Portuguese students' perceptions about their social intelligence and to analysis and discussion of the differences between groups according to their school grade. Participants are adolescents attending the 8<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> grades of Portuguese public schools. Adolescents were administered the Cognitive Test of Social Intelligence (CTSI; Candeias, 2007), a pictorial self-report instrument, aimed at the diagnosis of adolescents needs capabilities, experience and motivation to deal with interpersonal situations. Resultsof indicate the existence of statistically significant differences between three school grades. Problem Solves and Motivation indexes.

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### 1. Introduction

The construct of social intelligence has raised repeated research questions over the history of psychology. The design and the study of social intelligence has been part of general debate about intelligence, although its study has been more controversial and less investigated.

Thorndike (1920) used the notion of social intelligence to clarify that intelligence could manifest itself in different facets (Landy, 2005), and characterized social intelligence as the ability to accomplish interpersonal tasks. Thirteen years later, Vernon (1933) understood the social intelligence as the ability to get along with people, the awareness of social issues, the susceptibility to stimuli from other group members, and the insight to the states of temporary mood and personality traits of unfamiliar people. In the early 60's, Guilford (1967) defended that social intelligence referred to the behavioral content, involving the interactions between individuals and the attitudes, needs, desires, mood states, perceptions and thoughts about the others and ourselves (Rosas, Boetto, & Jordan, 1999). The 90's has seen a greater interest in understanding the social intelligence (e.g., Cantor & Kihlstrom, 1989; Ford & Tisak, 1983; Gardner, 1983, 1998; Sternberg, 1984; Sternberg & Barnes, 1988; Sternberg & Wagner, 1986). Specifically, Gardner (1998) discusses multiple intelligences and specifies two intelligences –interpersonal and intrapersonal. The interpersonal intelligence is the ability to read other people's moods, motives and others' mental

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states. The intrapersonal intelligence is the ability to access one's own feelings and to draw on them to guide behavior. Since then, numerous research efforts have explored the social intelligence construct (e.g., Cantor & Kihlstrom, 1987; Ford & Tisak, 1983; Goleman, 2006; Kosmitzki & John, 1993; Marlowe, 1986; Silvera, Martinussen, & Dahl, 1991; Walker & Foley, 1973).

Nevertheless, definitions of the construct and associated measurement approaches have varied to a notable degree across these perspectives. For example, recently, Goleman (2006) identifies two broad categories of social intelligence: social awareness and social facility. Social awareness deals with four abilities: (i) Primal empathy, which includes feeling for others, and sensing non-verbal emotional signals, (ii) Attunement, that is, listening with full receptivity, attuning to a person, (iii) Empathic accuracy, which means understanding another person's thoughts, feelings, and intentions and, (iv) Social cognition, that is, knowing how the social world works. In contrast, social facility includes (i) Synchrony, which means interacting smoothly at a nonverbal level, (ii) Self-presentation, that is, presenting ourselves effectively, (iii) Influence, which represents shaping the outcome of social interactions, and (iv) Concern, that is, caring about others' needs and acting accordingly.

Weis and Süß (2007), using a multitrait-multimethod-design and a confirmatory factor analysis supported the multidimensional structure of social intelligence for the domains of social understanding, social memory, and social knowledge. Others studies, based also these multitrait-multimethod designs, have provided clear evidence for the multidimensionality of social intelligence (Jones & Day, 1997; Lee, Day, Meara, & Maxwell, 2002; Lee, Wong, Day, Maxwell, & Thorpe, 2000; Wong, Day, Maxwell, & Meara, 1995).

The concept of social intelligence adopted in this paper is based on a cognitive and metacognitive approach of intelligence, from the influences of the Triarchic Theory of Intelligence formulated by Sternberg (1983), and the Theory of Multiple Intelligences developed by Gardner (1993). In this perspective, social intelligence is a multidimensional construct that refers interpersonal problem-solving processes and skills such as comprehension, elaboration of an action plan, execution and monitoring (Candeias, 2007). It comprises the analysis of procedural (e.g., cognitive process and performance), structural (e.g., type of contents elected for the resolution of the situation) and attitudinal (e.g., interest and self-confidence in problem-solving) levels of analysis of interpersonal cognition.

In summary, social intelligence has been thought of as the ability to accomplish interpersonal tasks (Kaukiainen et al., 1999) and to act adequately and shrewdly in relationships (Bjorkqvist, 2007; Frederiksen, Carlson, & Ward, 1984). Intelligence in interpersonal relationships has been characterized as a key ability (Hopkins & Bilimória, 2008), with some scholar arguing that the social facets of intelligence may be as important or even more important than the cognitive aspects (Sternberg & Grigorenko, 2006).

Despite the lack of consensus on concepts of social intelligence, empirical research has shown that social intelligence is a relevant component for socially competent behavior (Süß, Weis, & Seidel, 2005), seeming to adapt social and cultural changes around education, employment or performance (Candeias, 2008). Research has also demonstrated that girls (Carvalho, 2011) and women (Hopkins & Bilimória, 2008) register higher levels of social intelligence.

This study aims to present Portuguese students' perceptions about their social intelligence and to analyze and discuss differences between groups according to their school grade.

## 2. Method

### 2.1. Participants

Participants were 1171 adolescents, 590 girls (50.4%) and 581 boys (49.6%), aged between 11 and 25 years old ( $\mu = 14.84 \pm 1.89$ ), attending the 8<sup>th</sup>- (48.2%; N=565), 10<sup>th</sup>- (27.4%; N=321), and 11<sup>th</sup>- (24.3%; N=285) grades at elementary and secondary schools, in the northern, center and southern Portugal.

#### 2.1.1. Instrument

Social intelligence in adolescence was assessed with the Cognitive Test of Social Intelligence (CTSI, Candeias, 2007), a self-report instrument for adolescents from 12 to 17 years old. The CTSI draws on three interpersonal illustrative stimuli of real life situations in which people use social view. The first stimulus has an old lady and several youths at a bus stop, with the old lady facing in the wrong direction and out of place. The second stimulus presents a

dialogue between a teenager standing up and a couple sitting on a sofa in a living room, with the teenager telling a story and one member of the couple pointing to his pulse clock. The third stimulus represents a professional meeting of a leader with four subordinates, two of which are sitting in a sofa and with a passive attitude and the other two are standing and with arms in the air. Subjects are asked in each situation to answer a questionnaire with 16 questions, in which the first 10 are open-response format and the remaining six are in a 5 point scale (1=None and 5= Very much). The CTSI offers four indices of social intelligence (a) the index of Problem Solving of social situations (questions 1, 4, 5, 6, 7, 8, 9 and 10), (b) index of Motivation for the resolution of social situations (questions 11 and 12), (c) index of Self-confidence in solving social situations (questions 13 and 14) and (d) index of Familiarity with the resolution of social situations (questions 15 and 16). The results of the first ten items, involved in the calculus of the Problem Solving index specifically allow to analyze the comprehension of each social situation (questions 1 and 4), the ability to elaborate an action plan (question 5), the ability to execute one or more action plans (questions 6, 7, 8 and 9) and the capacity of monitoring those action plans (question 10) being assigned to each question from 0 to 3 points depending on the degree of complexity, accuracy, and generalization of the response. The remaining indexes are obtained by summing the respective items response values. For scoring purposes, the 14<sup>th</sup> item needs to be reversed. The interpretation of results is based on cognitive performance criteria and on attitudinal criteria expressed in the four indices global scores. Validation studies of the CTSI with Portuguese adolescents from 7<sup>th</sup> to 11<sup>th</sup> school grades demonstrate this is a test with good indicators of reliability and internal validity (Candeias, 2007).

### 2.1.2. Procedures

This study is part of the research project “Career and citizenship: personal and contextual conditions for ethical questioning of life-career projects.”<sup>†</sup> This project aims to contribute to the comprehension of the factors and processes of the adolescents’ psychosocial development (e.g., social competence, emotional intelligence, self-concept), as well as the conditions of their educational context that promote or inhibit these skills and attitudes (e.g., parents and teachers’ life values), in the development of life-career projects that consider not only tangible individual benefits, but also human, societal, and economic ends. To this end, basic and secondary schools in the north, center and southern Portugal were contacted, and formal meetings were scheduled with the direction boards and the educational agents (teachers, parents, and psychologists). These meetings were intended to present the main objectives and characteristics of this project, as well as, to obtain their permission and cooperation in the data collection process. Data were then collected from 8<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> grade students, in the classroom, in the presence of a teacher and a junior researcher. All were informed of the general objectives of the research and the ethical procedures associated with the data analysis. Completion of the Cognitive Test of Social Intelligence took, on average, 30 minutes per class.

## 3. Results

Table 1 presents the frequencies and analysis of variance of CTSI data considering school year. Results indicate that participants have average levels of social intelligence which are below the mean value of the indexes. In general, 8<sup>th</sup> grade students have higher mean scores in almost every dimension and indexes. There are exceptions in all situations, in which the 10<sup>th</sup> grade students have higher mean scores at the Familiarity index.

The comparison between the results obtained in each of the indexes, considering the global sample, and the mean values of the respective index, through a One-Sample T-Test, indicates the existence of statistically significant differences among the participants’ results and the standard scores in all indexes and per social situation. At the Problem Solving index, statistically significant differences were found between the global sample’s mean scores and the mean values, in all three stimulus social situations (S1:  $t(1163) = -63.94$ ,  $p = .000$ ; S2:  $t(1163) = -69.39$ ,  $p = .000$ ;  $t(1161) = -80.74$ ,  $p = .000$ ). At the Motivation index, statistically significant differences were found between the global sample’s mean scores and the mean values, in all three situations (S1:  $t(1164) = -8.78$ ,  $p = .000$ ; S2:  $t(1167) = -5.82$ ,  $p = .000$ ;  $t(1161) = -13.91$ ,  $p = .000$ ). At the Self-confidence index (S1:  $t(1162) = 10.44$ ,  $p = .000$ ; S2:  $t(1165) = 16.39$ ,  $p = .000$ ;  $t(1159) = 8.33$ ,  $p = .000$ ), and also at the Familiarity index (S1:  $t(1167) = -20.75$ ,  $p = .000$ ; S2:  $t(1166) = -$

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4.39,  $p=.000$ ;  $t(1159)=-14.96$ ,  $p=.000$ ), statistically significant differences were found, between the global sample's mean scores and the mean values, in all three situations.

The analysis of variance of the results considering the school year indicates the existence of statistically significant differences between the schools grades, in each situation. In situation 1, there are statistically significant differences in the Problem Solving index ( $F(2,1168)=47.37$ ,  $p=.000$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference= 1.934,  $p=.000$ ), and between the 8<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= 1.189,  $p=.000$ ). There are also significant differences in the Motivation index ( $F(2,1459)=-8.21$ ,  $p=.000$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference= .303,  $p=.038$ ), and between the 8<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= -.487,  $p=.000$ ). In situation 2, there are statistically significant differences in the Problem Solving index ( $F(2,1168)=8.03$ ,  $p=.000$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference=.879,  $p=.000$ ), and between the 10<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= -.634,  $p=.040$ ). There are also significant differences in the Motivation index ( $F(2,1168)=6.53$ ,  $p=.002$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference= -.423,  $p=.004$ ), and between the 8<sup>th</sup> and the 11<sup>th</sup> grades (Mean difference= .366,  $p=.023$ ). In situation 3, there are statistically significant differences in the Problem Solving index ( $F(2,1168)=8.91$ ,  $p=.000$ ), between the 8<sup>th</sup> and the 10<sup>th</sup> grades (Mean difference= .808,  $p=.000$ ) and between the 10<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= .487,  $p=.000$ ). Considering the global situations, there are statistically significant differences in the Problem Solving index ( $F(2,1168)=24.326$ ,  $p=.000$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference=3.63,  $p=.000$ ), the 10<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= -2.18,  $p=.001$ ), and the 8<sup>th</sup> and the 11<sup>th</sup> grades (Mean difference= 1.44,  $p=.023$ ), in the Motivation index ( $F(2,1168)=7.25$ ,  $p=.001$ ), between the 8<sup>th</sup> and 10<sup>th</sup> grades (Mean difference=.801,  $p=.033$ ) and the 8<sup>th</sup> and 11<sup>th</sup> grades (Mean difference= 1.16,  $p=.001$ ).

Table 1. The Cognitive Scale of Social Intelligence: frequencies and analysis of variance considering school year

Factor	Indices	School year	M (SD)	Range	F (2,1168)
S1	Problem Solving	8 <sup>th</sup> year	7.08 (2.81)	0-13	47.37***
		10 <sup>th</sup> year	5.15 (2.76)	0-12	
		11 <sup>th</sup> year	5.89 (3.34)	0-12	
		Total	6.26 (3.05)	0-13	
	Motivation	8 <sup>th</sup> year	5.75 (1.79)	2-10	8.21***
		10 <sup>th</sup> year	5.45 (1.68)	2-10	
		11 <sup>th</sup> year	5.26 (1.70)	2-10	
		Total	5.55 (1.75)	2-10	
	Self-confidence	8 <sup>th</sup> year	6.54 (1.53)	2-10	1.11 (n.s.)
		10 <sup>th</sup> year	6.40 (1.56)	2-10	
		11 <sup>th</sup> year	6.41 (1.45)	2-10	
		Total	6.47 (1.52)	2-10	
	Familiarity	8 <sup>th</sup> year	4.98 (1.72)	2-10	.868 (n.s.)
		10 <sup>th</sup> year	5.09 (1.58)	2-10	
		11 <sup>th</sup> year	4.91 (1.60)	2-10	
		Total	4.99 (1.65)	2-10	
S2	Problem Solving	8 <sup>th</sup> year	5.84 (.133)	0-12	8.03***
		10 <sup>th</sup> year	4.96 (.176)	0-12	
		11 <sup>th</sup> year	5.59 (.187)	0-12	
		Total	5.53 (3.17)	0-12	
	Motivation	8 <sup>th</sup> year	5.88 (1.99)	2-10	6.53*
		10 <sup>th</sup> year	5.46 (1.71)	2-10	
		11 <sup>th</sup> year	5.52 (1.86)	2-10	
		Total	5.68 (1.89)	2-10	
	Self-confidence	8 <sup>th</sup> year	6.78 (1.54)	2-10	.777 (n.s.)
		10 <sup>th</sup> year	6.65 (1.52)	2-10	
		11 <sup>th</sup> year	6.76 (1.55)	2-10	
		Total	6.74 (1.54)	2-10	
	Familiarity	8 <sup>th</sup> year	5.61 (2.09)	2-10	2.16 (n.s.)
		10 <sup>th</sup> year	5.90 (2.00)	2-10	
		11 <sup>th</sup> year	5.80 (2.02)	2-10	
		Total	5.74 (2.05)	2-10	
S3	Problem Solving	8 <sup>th</sup> year	5.26 (2.93)	0-12	8.91***
		10 <sup>th</sup> year	4.46 (2.82)	0-12	

Global Situations (S1, S2, and S3)	Motivation	11 <sup>th</sup> year	5.25 (2.96)	0-12	2.18 (n.s.)
		Total	5.04 (2.93)	0-12	
		8 <sup>th</sup> year	5.33 (1.93)	2-10	
		10 <sup>th</sup> year	5.28 (1.71)	2-10	
		11 <sup>th</sup> year	5.06 (1.73)	2-10	
	Self-confidence	Total	5.25 (1.83)	2-10	2.19 (n.s.)
		8 <sup>th</sup> year	6.47 (1.62)	2-10	
		10 <sup>th</sup> year	6.33 (1.44)	2-10	
		11 <sup>th</sup> year	6.25 (1.45)	2-10	
		Total	6.38 (1.53)	2-10	
	Familiarity	8 <sup>th</sup> year	5.06 (2.05)	2-10	1.24 (n.s.)
		10 <sup>th</sup> year	5.27 (1.94)	2-10	
		11 <sup>th</sup> year	5.07 (1.98)	2-10	
		Total	5.11 (2.00)	2-10	
	Problem Solving	8 <sup>th</sup> year	18.21(7.02)	0-34	24.33***
		10 <sup>th</sup> year	14.58 (7.47)	0-36	
		11 <sup>th</sup> year	16.74 (8.20)	0-35	
		Total	16.86 (7.59)	0-36	
	Motivation	8 <sup>th</sup> year	17.00 (4.76)	6-30	7.25***
		10 <sup>th</sup> year	16.20 (4.21)	6-29	
		11 <sup>th</sup> year	15.84 (4.28)	6-29	
		Total	16.50 (4.52)	6-30	
	Self-confidence	8 <sup>th</sup> year	19.78 (3.67)	6-30	1.71 (n.s.)
		10 <sup>th</sup> year	19.38 (3.61)	6-29	
		11 <sup>th</sup> year	19.42 (3.33)	7-30	
		Total	19.58 (3.58)	6-30	
	Familiarity	8 <sup>th</sup> year	15.64 (4.41)	6-30	2.21 (n.s.)
		10 <sup>th</sup> year	16.25 (4.06)	6-29	
		11 <sup>th</sup> year	15.78 (3.91)	6-27	
		Total	15.84 (4.20)	6-30	

#### 4. Discussion and Conclusion

This study aimed to present the social intelligence levels of a sample of Portuguese adolescents and to analyze and discuss the existence of differences according to school grade groups.

The results of the three indices of the Social Cognitive Scale of Intelligence (Candeias, 2007), considering the global sample, indicate average values ranging from 5.04 (S3) to 6.26 (S1) in the Problem Solving index, from 5.25 (S3) to 5.68 (S2) in the Motivation index, from 6.74 (S2) to 6.38 (S3) in the Self-confidence index, and from 5.74 (S2) to 4.99 (S1) in the Familiarity index. These results indicate the existence of statistically significant differences for each index, considering the global sample, when compared with the mean value of the respective index. This suggests that these students believe they have a poor performance in what concerns their ability to understand, make decisions about, and solve interpersonal situations personally meaningful (Candeias, 2007). These results are incongruent with those obtained in previous studies with samples of 8<sup>th</sup> grade Portuguese students, in which it was verified the absence of statistically significant differences between their results and the normative values of the Portuguese version of the scale (e.g., Carvalho, 2010; Pinto, Taveira, Candeias, Carvalho & Marques, 2013). However, it is important to note that in this sample, the 8<sup>th</sup> grade students have the highest mean scores, when compared with the other school grades, in almost all situations and indexes. Exceptions occur only for the Familiarity index, in which students of 10<sup>th</sup> grade get higher results at all situations.

In what concerns the hypothesis on the existence of school grade differences in the social intelligence, results indicate statistically significant differences across the three social situations, in the Problem Solving and Motivation indexes. According to these results, the 8<sup>th</sup> grade students have higher results in the Problem Solving and Motivation indexes, when compared to the 10<sup>th</sup> and 11<sup>th</sup> grade students. These results indicate that younger students believe they have a greater ability to use cognitive procedural and structural dimensions of problem solving (problem solving index) and also, they experience higher levels of interest and pleasure associated with the resolution of problems related to social situations. In what concerns the Self-confidence and the Familiarity indexes, differences were not found between the different school grades, which means that, in general, the confidence in their skills (self-confidence index), and the perception that they possess the knowledge and experience to effectively deal with



situations of a social nature (familiarity index), is similar across students from the different school grades. These results are distinctive from those obtained in the study developed by Candeias (2007), in which no differences were found between the results of SCSI depending on school grade. However, although the studies of Carvalho (2011) and Pinto et al. (2013) have not analyzed the differences between school grades, they suggest that younger students have statistically higher results in the Familiarity index, and that older students have statistically higher results in the Self-confidence index, respectively, and there are no differences in the Problem solving and Motivation indexes, depending on age.

These results show that Portuguese students of our sample have low-perceptions of social intelligence. In other words, these students believe they do not possess the necessary skills to effectively solve the problems they face in their social life. Given that several studies point to this relationship with academic, professional and social success (Gardner, 1999; Goleman, 2006; Gricorenko & Stenberg, 2003), reduced social intelligence levels can negatively influence the way these students design and manage their life career task and projects (Kihlstrom & Cantor, 2000). Thus, this study demonstrates the urgent need to invest in the development of educational and career interventions within scholar contexts that take into account the importance of the students' cognitive factors, such as social intelligence.

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