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Social competence and emotional comprehension: How are they related in children?

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Abstract: The developmental progression of emotional competence in childhood provides a robust evidence for its relation to social competence and important adjustment outcomes. This study aimed to analyze how this association is established in middle childhood. For this purpose, we tested 182 Portuguese children aged between 8 and 11 years, of 3rd and 4th grades, in public schools. Firstly, for assessing social competence we used an instrument directed to children using critical social situations within the relationships with peers in the school context - *Socially in Action-Peers* (SAp) (Rocha, Candeias & Lopes da Silva, 2012); children were assessed by three sources: themselves, their peers and their teacher. Secondly, we assessed children's emotional understanding, individually, with the *Test of Emotion Comprehension* (Pons & Harris, 2002; Pons, Harris & Rosnay, 2004). Relations between social competence levels (in a composite score and using self, peers and teachers' scores) and emotional comprehension components (comprehension of the recognition of emotions, based on facial expressions; external emotional causes; contribute of desire to emotion; emotions based on belief; memory influence under emotional state evaluation; possibility of emotional regulation; possibility of hiding an emotional state; having mixed emotions; contribution of morality to emotion experience) were investigated by means of two SSA (Similarity Structure Analysis) - a Multidimensional Scaling procedure and the external variable as points technique. In the first structural analysis (SSA) we will consider self, peers and teachers' scores on Social Competence as content variables and TEC as external variable; in the second SSA we will consider TEC components as content variables and Social Competence in their different levels as external variable. The implications of these MDS procedures in order to better understand how social competence and emotional comprehension are related in children is discussed, as well as the repercussions of these findings for social competence and emotional understanding assessment and intervention in childhood is examined.

1. Introduction

Several theoretical and empirical evidences have underlined the connection between social competence and emotional competence in children (Alves, 2006; Denham, Blair, DeMulder, Levita, Sawyer, Auerbach-Major & Queenan, 2003; Halberstadt, Denham, & Dunsmore, 2001; Hubbard & Coie, 1994; Izard, Fine, Schultz, Mostow, Ackerman & Youngstrom, 2001; Machado, Veríssimo, Torres, Peceguina, Santos & Rolão, 2008; Mostow, Izard, Fine & Trentacosta, 2002; Santos, 2012; Saarni, 1999).

There is a large panoply of definitions of social competence, some of them are quite broad, others quite specific. In this article we adopt the model of social competence of Ford (1982; Tisak & Ford, 1983). For Ford (1982), social competence is defined by "*the attainment of relevant social goals in specified social contexts, using appropriate means and resulting in positive developmental outcomes*" (p. 323). According to the scope of this research, the goal is related to being able to act effectively in social challenging situations with other people, in this case with peers. Our focus in this paper is on children's adjustment with peers within the school context. Through relationships with peers, children have the opportunity to develop social skills relevant to their harmonious development.

Saarni's model of emotional competence considers that this competence is inextricable form social competence. Emotional understanding is one relevant domain of emotional competence, and is conceptualized as children's general socio-cognitive understanding of perspective taking, desire, believes, intentions, understanding related to emotions in themselves and others (Harris, 1989; 2008). In order to have an understanding of emotions there are two essential aspects: awareness (manifested in different forms: reporting, anticipating, hiding or change the emotional state) and the identification and understanding of others' emotions. Harris (1989, 2008) proposes a number of types of consciousness: (a) about 1 year of age, children begin to recognize the emotional states that are directed, (b) by 3 years they begin to realize that people choose what they do according to their believes / desires, as well as begin to make sense of emotion (in self and others), (c) 4-6 years: understanding that emotional expression may not be a direct reflection of the state emotional (eg, are able to perceive the concealing of expressions), (d) from 6/7 years: the moral standards begin to be important in understanding that children have on emotion, (and) finally, later arises the understanding that is possible to modify the emotion, first by hiding the expression and then modifying the state itself.

The existence of a large panoply of definitions of emotion competence, in general, and understanding, in particular, has led to a lack of consensus and, consequently, to methodological limitations in research plans, and also to assessment and intervention in emotional competence. Several decades of research

on emotional development has underlined the contribution of several domains to emotional understanding in childhood. Based on this research, Pons and colleagues (Pons & Harris, 2002; Pons, Harris & Rosnay, 2004) have proposed the *Test of Emotion Comprehension* (TEC) which assesses nine domains of emotional understanding, namely the comprehension of the recognition of emotions, based on facial expressions; external emotional causes; contribute of desire to emotion; emotions based on belief; memory influence under emotional state evaluation; possibility of regulating emotion; possibility of hiding an emotional state; having mixed emotions; contribution of morality to emotional experience. These 9 components have a developmental orientation, following 3 stages: one external phase (3-6 years old), one mental phase (5-9 years old) and on reflexive phase (8-11 years old).

In this study we intend to assess how social competence in children appears associated to the understanding of emotions. Thus, we expect that children with a higher level of understanding of emotions have also a higher level of social competence. Besides, we intend to explore how the different components of emotional understanding (assessed by TEC) are related to social competence (assessed by SAp, in general and by the 3 referred raters).

2. Method

2.1. Sample

Data was collected in three public elementary schools in a Portuguese city (Évora - 50.000 habitants). Students from 10 classes from 3rd and 4th grade (5 classes each grade) were invited to participate in this study. 88,5% obtained parental consent to participate. Students with severe education needs were excluded from sample.

The final sample is constituted of 182 children aged between 8 and 11 years (M = 8,81; SD = 0,77); 52,7% (n=96) are boys and 47,3% (n=86) are girls; 51,6% (n=94) are from 3rd grade and 48,4% (n=88) from 4th grade. 7 children (3,85%) are from nationalities other than Portuguese (e.g., from eastern Europe countries, or Germany, Holland or Brazil), but all are fluent in Portuguese. Finally, regarding the schooling (number of years) of the children's mothers (which is considered a good index of socioeconomic status), 1,1% (n=2) are illiterate; 16,48% (n=30) went to elementary school; 10,99% (n=20) went to middle school; 32,97% (n=60) went to secondary school; 36,81% (n=67) have a university degree (8,96%, n= 6, of which have a masters degree; and 2,99%, n=2, have a PhD), and 2,2% (n=4) have not responded.

A group of 5 children of 11 years old, has been inserted into the group of 10 year olds.

2.2. Instruments

2.2.1. Test of Emotion Comprehension

The Test of Emotion Comprehension (TEC, Pons & Harris, 2000; Pons, Harris & Doudin, 2002; Pons, Lawson, Harris & de Rosnay, 2004) is divided into a sets of stories in an established order. The test evaluates the following components (corresponding to the theoretical dimensions of understanding of emotions): understanding of the (1) recognition of emotions based on facial expressions, (2) external causes of emotions (e.g., being sad when a pet dies), (3) assigning a desire as cause an emotion; (4) the role of believes in determining emotions, (5) the influence of memory in circumstances of assessment of emotional states, (6) the ability to regulate emotions, (7) the ability to hide or conceal an emotion; (8) that a person can have mixed emotions (e.g., happiness and fear at the same time) in relation to a given situation, and (9) the role of morality in emotions.

There is a version for boys and girls, and it consists of a booklet of illustrations with a story that is read for each situation and in every sheet are presented four possible outcomes represented by emotional facial expressions (there five options: happy, sad, angry, afraid, OK). The children are asked to assign an emotion represented by a facial expression to the situation. The instrument is also available in computerized format, where questions and stories are narrated by a female voice. The scoring is made automatically by the computer application. In this study we used the computerized format, only the male version, since this is the only available up to now for the European Portuguese.

Children's responses are nonverbal, considering that cross-cultural studies establish that facial expressions related to situations are similar across cultures. This test has been used in many countries around the world, being translated into 15 languages, is now being adapted into Portuguese (Portugal and Brazil).

This test can be used with children aged 3 to 11 years. Each child can get a score between 0 and 9.

2.2.2. Socially in Action-Peers

The instrument consists of six critical hypothetical social situations (one of them is an example for training) that require a variety of behavioral, emotional and cognitive skills. This version *Socially in Action-Peers* (SAp) (Candeias & Almeida, 2005; Candeias, Rebocho, Pires, Franco, Barahona, Franco, Santo, Oliveira & Pereira, 2008; Candeias & Rocha, 2012) was prepared taking into account issues of social development in terms of social interaction with peers relevant for this stage of development (Denham, 2007; Dodge, McClasky &

Feldman, 1985; Waters & Sroufe, 1983). In general terms, the SAp assesses social competence in children in critical social situations with peers in the school context, in intimate and informal situations: E. Spokesman situation (example); 1. Group work situation; 2. Integrating a new classmate situation; 3. Leading a group situation; 4. Visiting a sick classmate situation, and 5. Conflict situation; all available on Appendix).

Each child was evaluated in each situation by the three sources in order to obtain a panoramic assessment. Firstly, the child makes a self-assessment of her perceived competence in each of the situations, using a Likert-type scale (bad -1, medium - 2 and good - 3). In other versions of the SAp children were also asked about the perceived difficulty of each situation, which has been eliminated in this version to facilitate the questions comprehensibility, since children tended to confuse performance to difficulty. Then, each child is asked to nominate three colleagues (boys or girls, without needing to rank them) in her class perceived as the most competent to resolve each situation. Finally, the teacher evaluates the performance of each child using the same scale as the one used in self-evaluation version. In the format of peer assessment, we used the method of positive nominations instead of the evaluation of all classmates, because we felt that in developmental terms it would be difficult for these children to do it in a discriminant way to all colleagues.

For the instrument's scoring, example situation is not considered in the calculation of scores, as long as it has been used in order to help children to get familiarized with the test and the answer format. Several scores may be obtained for each child: (1) scores per rater, which consists on the sum of the five situations made by each rater (self, peers and teachers); (2) scores by situation, which consists on the mean of three sources scores in each situation; (3) composite score of social competence: which consists on the global mean of the three sources in all situations. In the case of peer assessment we counted the number of nominations that each child had in each situation. Since the classes in which children were placed had different number of students, t scores were calculated for each situation raw result. Cumulatively, considering that this procedure was going to generate different magnitudes in inter-rater metrics, we also calculated t scores for the self and teacher's ratings.

Finally, and to increase the predictive ability of the instrument, since each rater has systematic biases in their assessment, as result of the perceived (ir)relevance of certain behavioral data and the same selective attention, and considering the recommendations of previous studies (Ford, 1982; Waters & Sroufe, 1982); we calculated the composite score of social competence. Thus, it is possible to have a composite vision and also a specific one according to the perspective of different social actors.

2.3. Procedure

Prior to data collection, authorization for this study was obtained from the Ethical Panel of the Portuguese Ministry of Education, the National Commission for Data Protection, the three schools' principals, and finally, permission from parents of each child.

Data collection took place between March and June 2012. The administration of these tools is part of a larger study that sought to examine the relationship between the understanding of emotions, social competence and emotion regulation in children.

Regarding the administration of TEC, it was done individually with each child in a quiet place, using a laptop computer. The instructions were explained to the child and were clarified their doubts. The stories of the instruments and their questions were in European Portuguese by a female voice. After each question, the child chose the correct answer, and automatically passed to the next story. The computer application automatically recorded and quoted the child's response, which were then exported to SPSS. The administration of TEC took about 15 to 20 minutes with each child. Scoring procedure on component IV (*belief*) was changed in order to make the results more similar to the original ones, the same way the Italian adaptation did (either answers happy or OK were considered correct). This decision has been made because about 30% of all children answered OK, which seems also a plausible answer to us due to the fact that is also possible in terms of content (it's possible for the rabbit to feel ok) and to the fact that the Portuguese word for OK ("bem") may induce an use as synonymous of *happy*.

The SAp was administered in group in the classroom in the presence of the class teacher. We explained the study purpose to the children, assuring data confidentiality and voluntary participation. The instructions and situations were read aloud by the researcher and the children accompanied the reading. Firstly, the children made their self-assessment, and then they did the nominations of peers for each situation, situation to situation sequentially. Finally, a form was distributed to the teacher with the same situations. The administration of this instrument took approximately 30 to 45 minutes per class. Scoring was done according to the procedure described above.

Finally, children's results were reported back to their parents who have expressed a desire to know about it.

Data analysis was performed on SPSS 20.0. Hundap was used for the the "External variables as points technique" in SSA.

3. Results and discussion

3.1. Traditional analysis

Several theoretical and empirical evidences have underlined the connection between social competence and emotional competence in children (Alves, 2006; Denham, Blair, DeMulder, Levita, Sawyer, Auerbach-Major & Queenan, 2003; Halberstadt, Denham, & Dunsmore, 2001; Hubbard & Coie, 1994; Izard, Fine, Schultz, Mostow, Ackerman & Youngstrom, 2001; Machado, Veríssimo, Torres, Peceguina, Santos & Rolão, 2008; Mostow, Izard, Fine & Trentacosta, 2002; Santos, 2012; Saarni, 1999).

Our results confirm that emotional understanding is significant and positively correlated to social competence (r = ,281; p<,001). Considering the several evaluators used in this instrument, peers' assessment seems to be the one which has an higher level of correspondence with emotion understanding level (r = ,309; p <,001), followed by self-evaluation (r = ,168; p<,023) and teachers (r = ,165; p<,026). All situations of SAp, except situation 5 (conflict resolution situation) have a significant positive correlation with TEC's overall result. Finally, considering TEC's components, only components IV (*belief*; rs =,246; p<,001), VII (*hiding/concealing emotion*; rs = ,190; p < ,010) and VIII (*mixed emotions*; rs = ,199; p < ,007) are significant and positively correlated to social competence composite score.

In our study, we've obtained similar results to those find by previous Portuguese studies, such as those of Alves (2006), Machado, Veríssimo, Torres, Peceguina, Santos and Rolão (2008), Santos (2012) and Silva (2013) who (the last two ones) also used TEC for assessing emotional understanding.

Using regression analysis, all regression coefficients are low, as it follows: emotion understanding as determining general the social competence (F(1,180)=15,39; p<,000; R2a=0,074), the self-evaluation on SAp (F(1,180)=5,22; p<,023; R2a=0,023), the peers' evaluation on SAp (F(1,180)=19,026; p<,000; R2a=0,091) and the teacher's evaluation on SAp (F(1,180)=5,012; p<,026; R2a=0,022). On the other hand, using social competence as a predictor of emotional understanding components, it only predicts the following components: belief recoded (p<,001; R2a =,0055), mixed (p<,007; R2a =,034) e hiding (p<,010; R2a =,031)

If we only relied on this kind of traditional analysis, correlation and regression, the data analysis of the existing relations between social competence and emotional understanding would rest quite rudimentary, making us consider that the relationships were somewhat limited. The use of Similarity Structure Analysis appears to be a more suited tool to disclose the existing relationships.

3.2. Similarity Structure Analysis

In this section we present results concerning the relation between the Socially in Action-Peers items (5: self-evaluation; 5: peers' evaluation; and 5: teacher's evaluation of social competence) with TEC (high and low score) as external variable. For this analysis we relied on a multidimensional scaling approach using the SSA (Smallest Space Analysis - Guttman, 1965; or Similarity Structure Analysis - Borg & Lingoes, 1987) and the "External variables as points technique" developed by Cohen and Amar (2002). Table 1 Table 1 presents the Monotonicity coefficient correlation matrix of the 15 items of the Socially in Action-Peers.Figure 1 shows the SSA projection of the first two vectors of the three-dimensional space. The coefficient of alienation, which is the stress measure applied in SSA for assessing the goodness of fit was 0,073, indicating a good fit between the SSA solutions and the input correlation matrices. In this figure each point represents an aspect of the SAp items. In the same plot are inserted as external variable TEC.

A polar structure can be observed dividing the space according to the three types of sources of evaluation – self, peers and teacher. While in the left side of the plot are located the self-evaluation items, on the right side of the plot we observe the peers' evaluation items (Upper region) and Teacher's evaluation items (bottom part).

The "External variables as points technique" allow to establish a connection between emotional competence in children (TEC) and social competence (SAp). Firstly, all TEC low scores items are positioned on the left side of the plot (especially in the bottom area). Secondly, the two groups (high vs. low score on TEC) are quite distant. While the TEC low scores group are located in lower left side of the plot, the TEC high scores group are located in the central region of the polar structure indicating a significant positive correlation of the TEC high scores group with almost all SAp situations.

Table 1. Correlation matrix (Monotonicity Coefficient) of the Socially in Action-Peers items (5: self-evaluation; 5: peers' evaluation; and 5: teacher's evaluation of social competence)

SAp items	1	2	3	4	5	6	7	8	9	10	11	12	13	14
01 Self.1	100													
02 Self.2	21	100												
03 Self.3	51	31	100											
04 Self.4	48	49	50	100										
05 Self.5	27	8	33	46	100									
06 Peer.1	64	18	37	23	22	100								
07 Peer.2	34	34	24	23	19	69	100							
08 Peer.3	50	5	23	21	16	87	70	100						
09 Peer.4	28	24	19	28	26	67	79	77	100					
10 Peer.5	25	10	24	21	31	72	70	76	75	100				
11 Teach.1	57	22	34	31	-12	84	67	75	55	56	100			
12 Teach.2	29	6	11	6	-1	51	54	49	50	30	77	100		
13 Teach.3	53	24	33	28	11	78	59	71	52	44	91	77	100	
14 Teach.4	41	31	24	21	2	51	58	68	59	45	75	87	75	100
15 Teach.5	3	-5	-11	-11	1	41	45	53	57	47	57	60	45	57

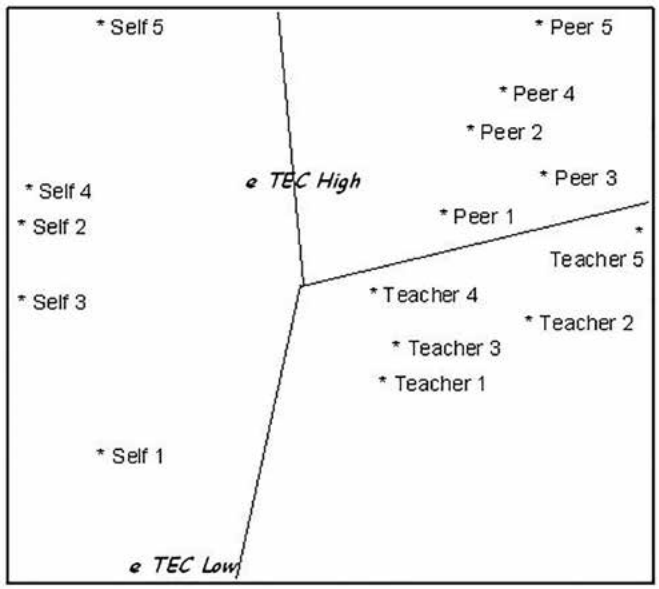

Fig. 1. SSA projection of the Socially in Action-Peers items (5: self-evaluation; 5: peers' evaluation; and 5: teacher's evaluation of social competence) with TEC (high and low score) as external (e) variables (1x2, 3-D, coefficient of alienation .073).

In another MDS analysis we considered TEC components as content variables and Social Competence in their different levels as external variable. In Table 2 is presented the correlation matrix (Jaccard Coefficient) of the nine TEC components and the correlation matrix of these items with the Socially in Action-Peers items. Each SAp item was transformed in high and low score, using the median as the cut-off point. Figure 2 shows the SSA projection of the bidimensional space. The coefficient of alienation, which is the stress measure applied in SSA for assessing the goodness of fit was 0,066, indicating a good fit between the SSA solutions and the input correlation matrices. In this figure each point represents an aspect of the nine TEC components. In the same plot are inserted as external variable the Socially in Action-Peers items.

A polar structure can be observed dividing the space in three regions according to the structural organization pointed out by Pons, Harris and Rosnay (2004). In the right side of the plot are located the first group of components, which may be labeled as "**external**", being the easiest. It focuses on external aspects of emotions, including the recognition of facial expressions (Recognition), understanding of the impact of situational causes on emotions (Cause), and understanding of the impact of associated external events or reminders on emotions (Reminder).

In the bottom region of the plot, closer to the center, are located two components characterized by the understanding of the various mental aspects of emotion which may be labeled as "**mental**": the understanding of the role of believes (Belief) and the distinction between outwardly expressed and privately felt emotions (Hiding). The third mental component – understanding the role of desires (Desire) on emotions that should be located in this region together with desire and belief, is situated in the upper right part of the plot.

The last group of components which may be labeled as "**reflective**" is located in the left region. It focuses on children's understanding of the way by which an individual can think about a particular emotionally charged event from more than one perspective, including the appreciation of concurrent mixed feelings (Mixed), cognitive control strategies (Regulation), and the effect of rumination about an unacknowledged misdemeanor (Morality).

Furthermore, the "External variables as points technique" allows to establish the connection between emotional competence in children (TEC) and social competence (SAp situations). As it is possible to observe in the SSA plot, while all SAp low score items are situated in left-hand size of the map, all SAp high score items are located in the next region to the right, higher up vertically in the space.

Table 2. Correlation matrix (Jaccard Coefficient) of the nine TEC components

TEC (Components)	1. Recog.	2. Ext. Cause	3. Desire	4. Belief	5. Remin.	6. Regul.	7. Hiding	8. Mixed
1. Recognition	100							
2. External Cause	97	100						
3. Desire	76	75	100					
4. Belief	83	81	64	100				
5. Reminder	80	79	65	72	100			
6. Regulation	76	76	67	66	63	100		
7. Hiding	68	69	59	67	64	59	100	
8. Mixed	69	69	61	60	58	61	65	100
9. Morality	43	44	45	48	46	48	47	54

Note: Decimals were omitted

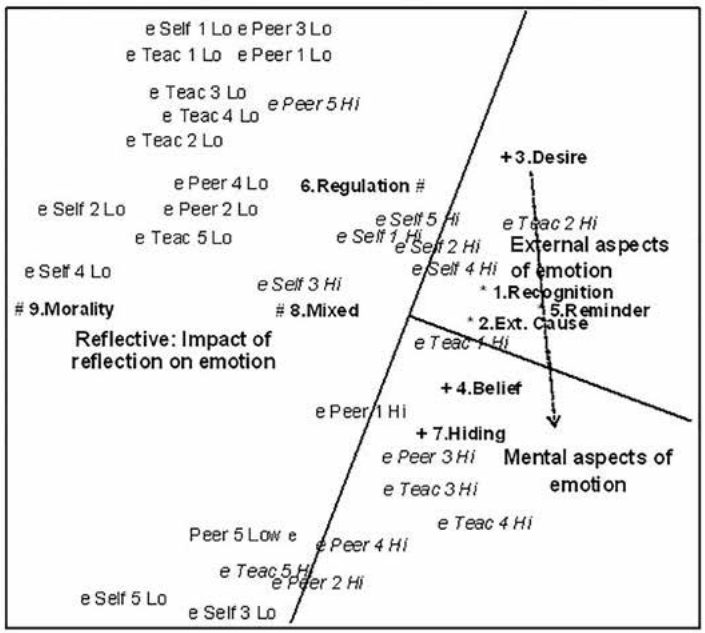

Fig. 2. Two Dimensional SSA projection of the nine TEC components with the Socially in Action-Peers items (5: self-evaluation; 5: peers' evaluation; and 5: teacher's evaluation of social competences as external (e) variables (coefficient of alienation .066).

Thus, while Reflexive facet (regulation, mixed and morality) of emotion understanding has little relation to children's social competence at this age – especially morality, the Mentalist facet (belief, desire and hiding) and, especially, the External facet (recognition, causes and reminder) of emotion understanding are the most related to social competence and, thereafter, the ones that are more able to differentiate children's level of social competence. It may be that in younger ages the External facet may be relevant in predicting social competence, as Santos (2012) found out in a study with Portuguese preschool children (4-6 years), in which component II (causes) was the only one to be positive and significantly associated with peers acceptance.

According to these results, even though the English sample has a different age range (3-11 years) and ours has a narrower one (8-11 years), it would be feasible to propose a distinct model with a different distribution of components along the 3 facets of emotional understanding. This result points out the necessity of further investigations using Multidimensional analysis in order to explore in more details the structure of emotion understanding.

Anyway, it is possible to point out also that the *Belief* component of TEC is related to the understanding of the role of belief in determination and that

requires the comprehension of false belief, which is considered a good indicator of perspective taking, useful in social competence. *Hiding/concealing* component of TEC is related to the understanding of the possibility that internal experience and external expression of emotion may not coincide; so this component may be positively related do social competence as far as for being socially accepted, sometimes, we should not be too much emotionally expressive. The component VIII (*mixed emotions)*, located in the center of the plot is about the understanding that a person can present multiple or even contradictory emotional answers in relation to a determined situation. This component may be relevant in social behavior as long as it may allow children to have a more flexible recognition of other's emotions and behaviors, and therefore better able to adjust her behavior in social interaction.

4. Conclusion

Emotional understanding and social competence play a central role in the development of pathways to mental health, as well as in academic success during childhood. The understanding of these connections is crucial for informing assessment, intervention and research in these domains. The use of MDS and SSA, in particular, enable researchers to do a more comprehensive analysis of data. Unlike factor analysis, the dimensions work as a means to enable the verification of different projections of the total configuration, having theoretical considerations in mind in order to decide about the usefulness and appropriateness of a multidimensional solution. In sum, in this type of analysis, looking for facets distribution facilitate the laborious work of theory construction and modification.

The use of Socially in Action-Peers and Test of Emotion Comprehension for assessing social competence and emotional understanding, respectively, has shown that these instruments allow researchers to better understand these constructs and how they are intertwined. According to our results, emotional understanding in general is positive and significantly related to social competence. In particular, there are some facets of emotional understanding that are more able to predict social competence in the age range of our sample (8-11 years), which are External and Mental aspects of emotions.

In our study, we have obtained similar results to those find by previous Portuguese studies, such as those of Alves (2006), Machado, Veríssimo, Torres, Peceguina, Santos and Rolão (2008), Santos (2012) and Silva (2013) who (the last two ones) also used TEC for assessing emotional understanding.

Within the practical relevance of this study, it is interesting to re-emphasize the contribution of using multiple informants in the assessment of social competence, and its relation to emotional understanding. The collection of indices of these

constructs allow practitioners to identify children at risk of social maladjustment, and based on the strengths and weaknesses will be possible, at a later stage, outline intervention plans according to the specific social skills and emotional understanding components to consider. Regarding TEC, it is also possible to compare a child's actual level of emotional understanding development to what was expected for her age. Likewise, in the prevention context, SAp and TEC can be used as a control measures to use in pre-and post-intervention programs of social and emotional competences. Both the instruments are of easy and fast administration, and children are amused to participate in its tasks.

This study has limitations; the most notable one is the sample size, which is small and unrepresentative. Besides, this study has a correlational design, which does not allow us to make inferences about causality. Another limitation is that we have not used another measure of social competence for external validation of the SAp. Finally our results point out that TEC needs, also, some revisions and adaptations that have been referred elsewhere (Rocha, Roazzi, Lopes da Silva, Candeias, Minervino, Roazzi & Pons, 2013). This way, in future studies, it should be used a larger sample and with a wider range of ages; to use another measure of social competence.

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Facet Theory (FT) is a meta-theory for designing structural and other theories in the behavioral sciences. Basic assumptions of FT are that social and behavioral concepts are complex constructs and that their study, therefore, requires a systematic design for defining observations and for examining the correspondence between the observations and the theory. Because such a definitional design should facilitate the evaluation of systematic relations between the data and the theory, it should lead to cumulative results. In the above sense, FT is a systematic approach for coordinating theory and research.

FT comprises the universe of observations, the population of respondents, and the range of observations. It stratifies these universes by facets and integrates the design by means of a mapping sentence which guides the construction of items and the formulation of hypotheses. Finally, particular multivariate data analysis methods (such as SSA, POSAC, MSA) have been developed to test these hypotheses.

Facet Theory has been successfully applied to a large number of research areas where it has significantly contributed to the discovery and refinement of empirical laws.

Our aims in this book are:

1) To review recent and innovative research results arising from the application of the Facet Theory approach to complex social and psychological issues;

2) To present methodological advances in comparative studies and applications of Similarity Structure Analysis (SSA), Multidimensional Scalogram Analysis (MSA), Factor Analysis (FA), Confirmatory Factor Analysis (CFA), Partial Order Scalogram Analysis (POSAC), and other multivariate procedures and techniques related to FT;

3) To present theoretical advances in Facet Theory and related approaches;

4) To present new reflections on the role of Facet Theory in modern science and in the emergence of new scientific paradigms.

Editors
Antonio Roazzi
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