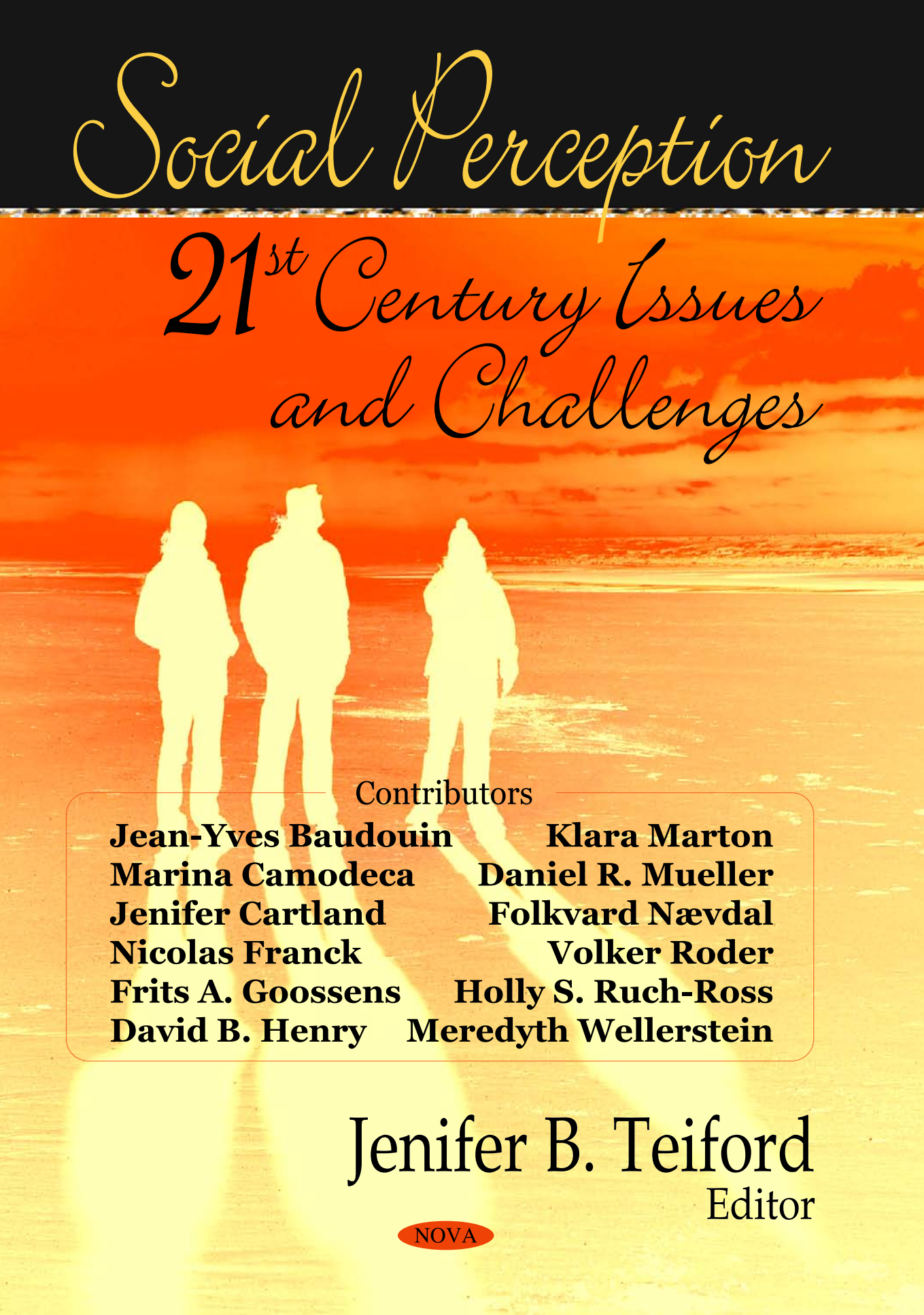
Social Perception

21st Century Issues and Challenges



Contributors

Jean-Yves Baudouin
Marina Camodeca
Jenifer Cartland
Nicolas Franck
Frits A. Goossens
David B. Henry
Klara Marton
Daniel R. Mueller
Folkvard Nævdal
Volker Roder
Holly S. Ruch-Ross
Meredyth Wellerstein

Jenifer B. Teiford
Editor

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SOCIAL PERCEPTION: 21ST CENTURY ISSUES AND CHALLENGES

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JENIFER B. TEIFORD
EDITOR

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PREFACE

The contemporary concept of social perception is considered to be an umbrella term that includes various other traditional and related phenomena such as person perception, impression and attitude formation, social cognition, attribution, stereotypes, prejudice, social categorization, and social comparison and implicit personality theories. This new book presents research on issues related to social perspectives and behavioral responses which follow. These include child perceptions, social class issues, perceived attractiveness theories, occupational prestige and related communication factors.

Chapter 1 – Social functioning requires the ability to identify the emotional state of our congeners. It implies facial expression analysis, which allows decoding emotional state, a crucial aspect of our social adaptation to our daily life. Misunderstanding other people feelings can conduct to inappropriate behaviors, which might be bizarre, or even delirious.

The study of facial emotion recognition is of particular importance in schizophrenia. An impairment of social functioning and bizarre behaviors are central characteristics of patients with schizophrenia. Many authors have suggested that this altered social functioning is associated with a reduced ability to identify emotional state from face. Bleuler already underlined troubles in facial emotions processing in the first description of schizophrenia. A deficit in facial emotion recognition has been reported in numerous studies The authors of reviews have frequently underlined the difficulties to perform clear-cut conclusions. Schizophrenia is indeed a complex disease, characterised not only by a great heterogeneity in symptoms, but also by a great heterogeneity of cognitive impairments.

Chapter 2 – This article discusses a range of statements and questions extracted from previous researches related to the relationship between family factors and delinquent behavior in adolescent.

Six expectations related to certain family factors' asserted impact on the process towards delinquent participation are formulated and designed for testing. Parental attachment and knowledge about the adolescent's whereabouts, peers and activities are seen as basic family qualities. Peer-selection and peer socializing are regarded to be a central links between the family area and delinquent acts. The explanation power in theoretical approaches is discussed.

The study is based on survey data from Bergen, the second largest town in Norway. Data were collected in spring 2002. Questionnaires were sent to 930 adolescents from selected schools, aged 15-16 year – in their last term in secondary school (Spring).

Six hundred and fifty nine pupils fulfilled the questionnaire (71 %). Family structure, parental attachment qualities, parental knowledge, peer-selection, adoption of deviant norms

(morality), and delinquent acts/behavior constituted the main themes and variable constructions.

Differences between traditional families (two parents) and alternative arrangements (one natural parent or neither of them) were found for financial situation at home, attachment qualities, psychological adjustment, parental knowledge, peer-selection, adoption of deviant norms and delinquent behavior. Family structure explained a unique part of the variance in delinquent behavior even after controlling for all other variables of relevance. Parental attachment qualities strongly predicted parental knowledge, but high level of the adolescent's feeling of being controlled, increased the probability of low level of parental knowledge. Family structure, attachment and knowledge predicted direct and indirect the adolescent's peer-selection that in turn was strongly related to delinquent behavior.

Chapter 3 - During the past few years, a number of integrated models have tried to explain the association between deficits in (neuro) cognitive domains and functional outcome (social and community functioning) in schizophrenia. Social cognition and therefore also social perception are considered to be possible mediating factors between neurocognition and functional outcome. Consequently, the direct intervention to reduce social perception deficits might be successful to improve neurocognitive and social functioning within integrated treatment of schizophrenia. One of the first comprehensive group therapy programs targeting deficits in all described functional areas is the Integrated Psychological Therapy (IPT). IPT consists of five subprograms: the first subprogram focuses directly on neurocognition, the second one addresses social perception, and the last three subprograms target social competence and problem solving.

The aim of this meta-analytic study was to examine a) the effectiveness of broad-based integrated group therapy in all of its specific intervention topics, b) the possible additional effects of social perception therapy combined with neurocognitive remediation, and c) whether improved social perception is associated with improvements in neurocognitive and social functioning. For this purpose 23 independent IPT studies including neurocognition and social perception subprograms of IPT were selected and quantitatively reviewed.

Each of the neurocognition and social perception subprograms of IPT show significant improvements in the specific intervention areas after treatment compared to baseline. But the most salient results indicate favorable effects in social perception and neurocognition when both subprograms are combined. Institutional conditions do not influence these effects. Nevertheless, both treatment conditions obtain superior effects compared to control groups. Moreover, improvements in social perception during group therapy are significantly associated with improvements in neurocognitive and social functioning.

In summary, this study corroborates the evidence of successful treatment of social perception in schizophrenia patients. The results indicate that improved social perception contributes independent variance to treatment effects in functional outcome. Consequently, and in accordance with integrated and consensus oriented models, cognitive therapy of schizophrenia patients should especially consider social perception and other social cognitive areas to optimize neurocognitive rehabilitation. Against this background the group is just carring out an international multi-center study on the new therapy approach called Integrated Neuocognitive Therapy (INT). This newly developed approach is based on psychological interventions addressed to neurocognitive and social cognitive domains, which were recently defined by the NIMH initiative for Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS), and on IPT technology.

Chapter 4 - The main focus of the present contribution is on the way in which children perceive and understand social situations and on how this perception can be the basis of children social behavior. Therefore, a deep comprehension of social perception could be extremely useful to uncover also consequent behavior and to cope with undesired actions.

Social information processing (SIP) theory (Crick & Dodge, 1994; Dodge, 1986) seems particularly helpful for this purpose. It is supposed to take place in six steps, in a circular formula. According to this approach, children code social cues, give them meaning through interpretation of others' intents and causal attributions, clarify their goals, search for possible responses and choose one of them. Finally, they enact the behavior chosen, and the cycle starts again.

Processing the whole SIP cycle in a skillful way leads to social competence, whereas biased processing may lead to aggression and social deviance. This contribution is aimed at giving a particular attention to the way in which different behaviors may have origins in social perception. In particular, the authors considered how aggressive children and children involved in bullying perceive social situations and respond to them.

Following elaborations enhanced the SIP model by considering also the role of emotion (Lemerise & Arsenio, 2000) and morality (Arsenio & Lemerise, 2004). Consequently, all the steps in the process are affected by emotions and moral judgments, which, together with social cognition, influence behavior.

Finally, after explaining how children perceive social situation and intentions, the authors focus on how they perceive their peers. Actually, it seems that particular characteristics of others elicit specific responses and therefore contribute to shape social behavior.

Chapter 5 - This chapter includes studies that examine various aspects of social perception and communication in a special population, children with specific language impairment (SLI). The data obtained from this population help us to study the dynamic nature of and the interrelationships within social cognition and communication. Based on observations, interviews, and experiments with children with SLI, their peers, parents, and teachers, the authors offer a new theoretical hypothesis of social cognition. The "serial circuit" hypothesis proposed in the present chapter helps us to interpret the relationship between a wide range of social-cognitive functions, such as social perception and self-esteem. According to this hypothesis, the various factors of social cognition and communication function similarly to a serial electric circuit with many light bulbs. Light is sparkled by these bulbs only if the circuit is complete. If you unscrew any of the bulbs, the system shuts down. Typically, the different functions of social cognition and communication are intertwined in a manner that results in a complete system. The findings in children with SLI help us to better understand these relationships by showing us the consequences of any dysfunction within the system. This chapter includes data on self-perception, the perception of others –parents and teachers-, mimicry, consistencies in behavior, executive functions –attention switching, emotion control, inhibition, perspective taking-, and social-pragmatic problem solving in children with SLI. Beyond the theoretical merit of the present findings, the data have relevant clinical implications for professionals working with populations that show difficulties in social interaction.

Chapter 6 - In a previous attempt to measure school-based social capital for adolescents, the Hospitality Scale was developed and found to be negatively associated with behaviors (substance use and firearm ownership) that are considered to be related to social isolation and violent behavior. The current chapter relates the Hospitality Scale to broader notions of social

support and social experience in order to isolate the distinct contribution of Hospitality as a form of social capital; it further examines Hospitality as a school-level construct for middle schools and high schools. The findings presented suggest that Hospitality is an independent construct, associated with social support and social experience to a limited degree at both the student level and the school level, though in somewhat different ways for students and schools. The authors conclude by considering further analytic paths to associate both student-level perceptions of Hospitality and school-level Hospitality scores to student risk behavior.

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Chapter 1

FACIAL EMOTION RECOGNITION IN SCHIZOPHRENIA

Jean-Yves Baudouin and Nicolas Franck
Institut des Sciences Cognitives,
Lyons, France

INTRODUCTION

Social functioning requires the ability to identify the emotional state of our congeners. It implies facial expression analysis, which allows decoding emotional state, a crucial aspect of our social adaptation to our daily life. Misunderstanding other people feelings can conduct to inappropriate behaviors, which might be bizarre, or even delirious.

The study of facial emotion recognition is of particular importance in schizophrenia. An impairment of social functioning and bizarre behaviors are central characteristics of patients with schizophrenia. Many authors have suggested that this altered social functioning is associated with a reduced ability to identify emotional state from face (e.g., Feinberg, Rifkin, Schaffer, & Walker, 1986; Walker, McGuire, & Bettes, 1984). Bleuler (1911) already underlined troubles in facial emotions processing in his first description of schizophrenia. A deficit in facial emotion recognition has been reported in numerous studies (for reviews, see Edwards, Jackson, & Pattison, 2002; Mandal, Pankey, & Prasad, 1998; Morrison, Bellack, & Mueser, 1988). The authors of reviews have frequently underlined the difficulties to perform clear-cut conclusions. Schizophrenia is indeed a complex disease, characterised not only by a great heterogeneity in symptoms, but also by a great heterogeneity of cognitive impairments.

In what follows, we draw a general schema of facial emotion deficit in schizophrenia, based to current scientific advances.

FACIAL EMOTION RECOGNITION DEFICIT IN SCHIZOPHRENIA: A TRAIT MARKER

Some authors have suggested that a deficit in facial emotion recognition is a marker of schizophrenia. This suggestion has many implications. First, the deficit should be indicative of schizophrenia. In other words, it is not sufficient to show that patients with schizophrenia have a deficit; they also should have a stronger deficit than other psychiatric patients. Second, to be diagnostically useful the deficit has to be present at any phase of the disease, ideally before the first episode, even if its intensity varies. Third, we have to be sure that the deficit should not be associated with a particular subtype of schizophrenia or some particular symptoms.

Deficit in Facial Emotion Recognition, Schizophrenia and Others

Numerous studies have shown that the deficit in facial emotion recognition is more severe in schizophrenia than in other psychiatric troubles, in particular in depression (Archer, Hay, & Young, 1992; Cutting, 1981; Feinberg et al., 1986; Gaebel & Wölwer, 1992; Gessler, Cutting, Frith, & Weinman, 1989; Weniger, Lange, Ruther, & Irle, 2004), affective disorders (Walker et al., 1984), anxious disorders (Mandal & Rai, 1987) and in bipolar disorders (Addington & Addington, 1998). The lower performances of patients with schizophrenia do not mean that they are strictly unable to recognize facial emotions. According to works realized in this field of research, difference in accuracy between schizophrenic patients and controls was on average around 10%, ranging from 5% to 25%. In most studies, they responded above chance level. Consequently, the deficit is not an inability but an alteration. This point might be important. A patient totally unable to decode emotional state of congeners from their facial expression, as it may occur after some brain damages, would have behaved without this mechanism and developed alternative strategies. The existence of residual abilities in schizophrenia places patients in a quite different situation. They are able to « process » the emotional inputs, and even sometimes to process them in an accurate way. The viability of this mechanism is altered and it is more frequent for patients with schizophrenia than for healthy subjects that the perceived emotions do not correspond to the emotions expressed by congeners. Finally if a patient with schizophrenia is confident in his/her actual perception, his/her response has a great probability to be inappropriate.

The difference in means conceals another phenomenon. The variation around these means is often stronger for schizophrenic patients than controls. This signifies that schizophrenic patients are not a homogeneous population. Besides, it is not rare to observe in a group of schizophrenics some patients performing tasks on facial emotions as well as controls, or even better than controls in average. The comprehension of the causes of this variability is a important challenge in the studies on schizophrenia, and consideration of the different subtypes and symptoms of schizophrenia will probably help to solve this discrepancy.

Facial Emotion Recognition Deficit and the Different Kinds of Schizophrenia

We have underlined that to be a marker of the disease the deficit in emotion recognition has to be present at any phase and for any subtype of schizophrenia. We also underlined that previous studies frequently reported a high variability within their schizophrenic groups. It so appears important to ensure that this variability does not result from the fact that the deficit is restricted to some schizophrenic patients according to the phase of the illness, their subtype, dominant symptoms, duration of illness, medication, and so forth.

About the phase of the illness, Gessler et al. (1989) observed that acute schizophrenics had significantly worse results than remitted schizophrenics, controls, and depressed patients during an emotion recognition task. In this study, remitted schizophrenics performed worse than controls. In a more recent study by Penn et al. (2000), schizophrenic patients admitted in an acute care unit exhibited worse emotion recognition performance that schizophrenic patients in an extended care unit. Nevertheless, differences between the two groups were reduced when controlling for active symptoms. In the same way, studies that tested the same group of patients at different phase of their disease reported that schizophrenic patients remained impaired in emotion recognition whatever the phase. For example, Gaebel and Wölwer (1992) studied a group of acute patients within three days after their admissions, and four weeks later. They reported that even if their performances in emotion recognition were better after four weeks, they remained impaired in comparison to controls and depressives. In a similar study by Streit, Wölwer, and Gaebel (1997), no improvement was observed after four weeks, with a deficit at any phases. Addington and Addington (1998) have also reported no improvement by testing patients twelve weeks after their admissions. Since Edwards et al. (2001) observed an emotion recognition deficit in first-episode schizophrenic patients, this deficit can be considered as being present at any phase of schizophrenia. Some authors have thus suggested that the deficit in facial emotion recognition is a *trait marker* of schizophrenia, even if the severity of the deficit may evolve during the illness, being more prominent during acute phases (e.g., Penn et al., 1997).

Many other factors were described as having few or no impact on the deficit. Notably, medication does not allow improving emotion recognition abilities (e.g., Gaebel & Wölwer, 1992; Lewis & Garver, 1995; Loughland, Williams, & Gordon, 2002; Streit et al., 1997). For example, Lewis and Garver (1995) did not observe better performances 15 days after the treatment started. Schneider et al. (1995) reported no difference between patients on or off neuroleptics, nor did they find correlations with dose of neuroleptics. Elsewhere, early signs of schizophrenia do not seem to influence the severity of the deficit (Walker, Marwit, & Emory, 1980). In the way of a relative stability of the deficit, many studies reported no effect of hospitalisation numbers or duration, or chronicity of schizophrenia (e.g., Addington & Addington, 1998; Salem, Kring, & Kerr, 1996). These observations strengthen the hypothesis that facial emotion recognition deficit is a trait marker of schizophrenia.

The high variability in schizophrenic patients' performances is hardly explained by the factors we described above. Another factor received increasing interest last years; many authors suggested that the size of the deficit might depend on the dominant symptoms. It was notably frequently reported a covariation between the severity of negative symptoms and the facial emotion recognition deficit (e.g., Addington & Addington, 1998; Baudouin, Martin, Tiberghien, Verlut, & Franck, 2002; Gaebel & Wölwer, 1992; Leitman et al., 2005; Mandal et al., 1999; Martin, Baudouin, Tiberghien & Franck, 2005; see also Schneider et al., 1995).

Some authors also suggested a link with positive symptoms (e.g., Addington & Addington, 1998; Leitman et al., 2005; Silver, Shlomo, Turner, & Gur, 2002). The deficit could even be particularly associated with some subscales for the evaluation of negative or positive symptoms. For example, Gaebel and Wölwer (1992) reported a correlation between the deficit in emotional processing and the score at item alogy, Schneider et al. (1995) with bizarre behaviour, Kohler et al. (2000) with alogy, hallucinations and thought disorders, and Shaw et al. (1999) with affective flattening. Nevertheless, the results are not sufficiently coherent at this time, and it remains actually difficult to draw a systematic schema of the relationships between facial emotion recognition deficits and symptoms. Further investigations would clarify the situation.

THE DEFICIT IS NOT RESTRICTED TO FACIAL EMOTION RECOGNITION

Patients with schizophrenia have a deficit in many tasks involving emotional materials. We will focus on some aspects.

Affective flattening was reported as soon as the first descriptions of schizophrenia. Bleuler (1911) himself proposed that the emotional deterioration and the absence or reduction of facial expressiveness was a fundamental symptom of schizophrenia. The dimension *Flat affect* is the first dimension of the Scale for the Assessment of Negative Symptoms (SANS, Andreasen, 1982). Current classification norms consider that flat affect is one of the main negative symptoms in schizophrenia (American Psychological Association, 1994). Experimental investigations widely confirm that schizophrenic patients have a reduced expression. For example, Gaebel and Wölwer (1992) recorded patients during an interview that took place within the three days following admission. The interview focused on present or past good and bad experiences to elicit positive and negative emotions. The patients were also asked to imitate a facial emotion that was displayed on a photograph, or to simulate it according to its label. Independent raters reported a reduced facial activity in patients with schizophrenia by comparison to a control group of healthy participants. The patients also showed less often a correct imitation or simulation by comparison to controls. The deficit remained stable after four weeks, when patients were partly remitted. Thus, schizophrenic patients are characterised by a stable reduction of involuntary facial activity and a disturbed voluntary facial activity. More recently, Tremeau et al. (2005) also reported disturbed expression, but similar for patients with schizophrenia and patients with depression (see also Gaebel & Wölwer, 2004).

The reduced expression is not restricted to face in schizophrenia. Shaw et al. (1999) studied affect expression by using both facial and vocal markers of flat affect. Schizophrenics completed a 20-minutes interview in which they were told to describe happy, sad and neutral experiences. They observed that affective flattening was associated with inflections' and pauses' durations during the interview. In other words, the more patients showed flat affect, the less their speech was fluent and expressive.

Some studies have also suggested that schizophrenic patients also have a deficit in experimenting emotions. For example, Schneider et al. (1995) used a mood induction task where patients were shown happy or sad facial expressions. They were told to look at a face

and to use it to help them to feel happy or sad, by imaging what would make the person on the picture happy or sad, or to think to a personal event that evokes this feeling. The authors recorded self-rating of happiness and sadness. Mood induction was reduced in schizophrenic patients, especially for happiness. However, other studies also reported equal or higher emotional experience in schizophrenia by comparison to controls (e.g., Aghevli, Blanchard, & Horan, 2003; Berenbaum, & Oltmanns, 1992; Kring, Kerr, Smith, & Neale, 1993; Kring & Neale, 1996). Aghevli et al. (2003) for example used a role play test that allows assessing participants' ability to solve interpersonal problems through conversation. Subjective rating of emotion following the completion of this task indicated that schizophrenics reported equals level of emotional experience than controls. Nevertheless, they were less expressive. Aghevli et al. (2003) concluded to an expression/experience disjunction in schizophrenia. Then schizophrenic patients do not only have difficulties in decoding the emotional states of others, but that they also have disturbances in communicating their own emotional states to others.

Schizophrenic patients also have disturbances in emotion recognition via affective prosody (for a review, see Edwards et al., 2002). Some studies have reported a deficit in decoding emotional information during recognition of emotion in speech, notably for chronic patients (e.g., Haskins, Shutty, & Kellogg, 1995; Hooker & Park, 2002; Kerr & Neale, 1993; Leentjens, Wielaert, van Harskamp, & Wilmink, 1998; Whittaker, Connell, & Deakin, 1994), but also in first-episode schizophrenia (Edwards et al., 2001). Kerr et al. (1993), for example, designed a test battery to measure emotion perception. Two tests – identification and discrimination tests - investigated vocal emotion perception. Speakers read neutral sentences (e.g., "The boy went to the store") with emotional intonations corresponding to basic emotions. In the voice emotion identification task, participants had to tell which emotion simulated the speaker. In the voice emotion discrimination task participants listened for two sentences and had to say whether the emotion was the same in each sentence or not. Kerr et al. (1993) reported that schizophrenic patients performed worse than normals at the two tasks. This observation was replicated later with the same test (Leitman et al., 2005). Kerr et al. (1993) also showed that the deficit in vocal emotion recognition in schizophrenia was highly correlated to the deficit in facial emotion recognition. This last observation was also replicated in more recent studies (e.g., Shaw et al., 1999), and in first-episode schizophrenia (Edwards et al., 1991).

The deficit in emotion recognition is thus central in schizophrenia and is more severe than in other psychiatric diseases. It is important to note that it is not specific to the processing of facial information but that it relates to all the ways of communication of emotional states. The schizophrenic patients cannot make up for their deficit in facial emotion recognition by using other sources of information, as the voice. The deficit is also accompanied by difficulties in communicating their own emotional state. In this context, it is not surprising that these patients present dysfunctions in the social interactions more marked than for other psychiatric diseases. Some localized brain lesions can involve a deterioration of the recognition of the facial emotion, going until a total disablement, but they leave often intact the capacity to recognize the emotional state by the voice or the ability of communicating its own emotions. Not only the schizophrenic patients do not manage to correctly interpret the emotional state of others from their face, but also they cannot do it by other modalities. Moreover, the others do not correctly interpret emotional state of patients suffering from schizophrenia, and probably adopt inappropriate behaviours. All these

elements make a favorable ground for the emergence or the reinforcement of bizarre behaviors and delusional ideas.

TENTATIVE EXPLANATIONS OF THE DEFICIT

The cause of facial emotion recognition deficit in schizophrenia gave raise to many explanations. Some authors explained the deficit by referring it to a deficit in a general cognitive ability, like for example attention. Some others focused more on the alteration of a specific domain, like a face-specific system, or configural information processing. We will present some of these hypotheses.

The Hypothesis of a Generalised Deficit for Facial Information Processing

A debate was open in the literature to know whether the deficit in facial information processing is specific to facial emotion or whether it extends to all facial information, including identity, gender, and so forth. The first dominant position was in favour of a specific deficit for facial emotion (Borod et al., 1993; Bryson, Bell, & Lysaker, 1997; Cutting, 1981; Heimberg, Gur, Erwin, Shtasel, & Gur, 1992; Mandal & Rai, 1987; Mandal et al., 1998; Walker et al., 1984). Cutting (1981), for example, did not observe any deficit in age processing in a group of acute schizophrenic patients when compared with depressive patients. On the contrary, schizophrenic patients were less accurate in an emotion discrimination task. Walker et al. (1984) reported that chronic schizophrenic patients had scores at the Benton test (a test that evaluates perceptual face abilities) that did not differ from controls. In the study by Borod et al. (1993), the deficit in emotion recognition was always significant when scores at the Benton test was used as a co-variable in statistical analyses, what allowed the authors to conclude that the deficit for facial emotion does not result from a general deficit in face processing abilities.

However, some studies reported data that work in the way of a generalized deficit, i.e. a deficit extending from emotion to face recognition, familiarity, or age (e.g., Addington & Addington, 1998; Archer et al., 1992; Feinberg et al., 1986; Gessler et al., 1989; Kohler et al., 2000; Novic, Luchins, & Perline, 1984; Salem et al., 1996). Notably, Novic et al. (1984), contrary to Borod et al. (1993), did not report any difference between schizophrenic patients and controls when the score at the Benton test was entered as a co-variable into the analyses. By using a similar procedure than Heimberg et al. (1992), Kohler et al. (2000) reported a similar deficit for emotion and age. Nevertheless, these authors have suggested than the deficit for emotion was associated with symptoms, contrarily to the deficit for age. The study by Kerr and Neale (1993) was also in favour of a generalized deficit. They reported, for a group of chronic untreated schizophrenic patients, strong correlations between the scores at the Benton test and several tasks assessing facial emotion processing (from .58 to .70). Later, this observation was replicated with treated patients (Mueser et al., 1996; Salem et al., 1996). In the same way, Addington and Addington (1998) reported correlations between many tasks involving emotional and non emotional face processing.

One may be tempted to conclude that the deficit is not restricted to emotional facial information, but extend to any task involving face processing. Nevertheless, as Gaebel and Wölwer (1992) have suggested, an exacerbation of the deficit for facial emotion (but not other kinds of facial information) during particular phases of schizophrenia – notably the acute phase – cannot be excluded. Penn et al. (2000), by using the same tasks that Kerr and Neale (1993) observed a generalised deficit for remitted patients, but a stronger deficit for emotion for acute patients. Two other studies reported diverging results whereas they used the same tasks. Heimberg et al. (1992) reported a selective deficit, Schneider et al. (1995) a generalized deficit. The first authors studied acute schizophrenic patients, the second ones studied remitted patients.

The main conclusion is that schizophrenic patients are impaired in processing facial information whatever the task, either emotional or not. Thus, the impairment is generalized, at least in remitted phases. Nevertheless, an acute episode may exacerbate their deficit for facial emotion more than for the other kinds of facial information. Through time, schizophrenic patients would remain impaired for all kinds of facial information, but especially for emotional ones.

The Hypothesis of a General Cognitive Decline

Several studies tested whether the deficit in facial emotion recognition can be accounted for by a more general cognitive decline (Bryson et al., 1997; Kee, Kern, & Green, 1998; Kohler et al., 2000; Sachs, Steger-Wuchse, Kryspin-Exner, Gur, & Katschnig, 2004; Schneider et al., 1995). For example, Schneider et al. (1995) used a neuropsychological battery that assess intellectual, attention-vigilance, abstraction-flexibility, memory-learning, language, spatial organisation, and sensory-motor functions. They observed a correlation between facial emotion recognition ability and abstraction-flexibility, memory-learning, language, spatial organisation. Kohler et al. (2000) reported significant correlations with abstraction-flexibility, attention, verbal and non-verbal memory and language; Sach et al. (2004) with abstraction-flexibility, verbal and non-verbal learning and language. Nevertheless, by using a similar procedure, Bryson et al. (1997) concluded that general cognitive abilities have only few influences on performance in facial emotion tasks. They also observed correlations, but they were weak (from .30 to .40, a range that corresponds to most the correlations reported in other studies). Mainly, the performances to these tests only allowed explaining 34% of the variance during emotion recognition tests.

Kee et al. (1998) made a similar observation as that of Bryson et al. (1997), reporting weak or no correlations between facial emotion recognition tasks and some tests of general cognitive abilities. Nevertheless, they have also reported an exception: they observed strong correlations (from .65 to .70) between emotion recognition tasks and a test designed to evaluate the ability to find one of two target letters (e.g., “T” or “F”) among a panel of 3 to 12 letters. Some other authors used the same task as a test of attention abilities (e.g., Addington & Addington, 1998). Thus, among the various cognitive abilities that were tested, one may be a better candidate to explain the deficit in facial emotion recognition in schizophrenia: attention.

We will develop wider the hypothesis of an attention deficit in the next section. Before that, in order to conclude about the hypothesis of a general cognitive decline, studies that

have been described indicated that this decline (with the possible exception of attention) might only explain the deficit for facial emotion partially, or in a weak extend.

The Hypothesis of an Attention Impairment

A single face allows extracting many kinds of information on the person; the emotional state, but also identity, gender, ethnicity, age, and so forth. To be accurate for each of these kinds of information, we have to be able to process each of them independently from the other (e.g., we have to be able to recognize an emotional expression on every face, whatever its familiarity, gender, ethnic origin, and age). Many studies actually suggest that this ability is not automatic, some interferences being possible (e.g., Baudouin, Gilibert, Sansone, & Tiberghien, 2000; Baudouin, Sansone, & Tiberghien, 2000, 2002; Ganel & Goshen-Gottstein, 2002, 2004; Goshen-Gottstein & Ganel, 2000; Rossion, 2002; Schweinberger, Burton, & Kelly, 1999; Schweinberger & Soukup, 1998). Since one of the characteristic features of schizophrenia is an alteration of attention ability, one may suggest that the deficit in face processing, and more particularly in facial emotion recognition, results from the fact that schizophrenic patients have difficulties to selectively process each kind of facial information, being disturbed by the variability of others.

This suggestion was made, among others, by Addington and Addington (1998). They used different tasks to test for attention. One task was similar to the one used by Bryson et al. (1997), participants having to find out one of two target letters in a panel of three to twelve distracting letters. In the second task, participants had to press a key each time a predesigned number appears in a sequence of numbers presented one at the time. Addington and Addington (1998) reported correlations between performance to these two tasks and emotion recognition abilities in schizophrenia (from .48 to .65). These same correlations were not significant or lower in controls and patients with bipolar disorders. Overall, studies that tested for a general cognitive decline often reported similar correlation when they tested for attention with similar tasks. We have already described the study by Kee et al. (1998) who reported correlations from .65 and .70. Kohler et al. (2000) also reported strong correlation (.60) between deficit in facial emotion recognition and a battery that tested attention-vigilance abilities (see also Combs & Gouvier, 2004). A deficit in attention abilities thus appeared closely linked to the difficulties schizophrenic patients have in facial emotion recognition.

We developed two experiments to test for the effect of attention manipulation on the ability to processing facial information in schizophrenia (Baudouin et al., 2002; Martin et al., 2005). In the first one, Baudouin et al. (2002) used the Garner paradigm; participants were required to perform two classification tasks according either to identity or emotion respectively. Two distinct identities (person A or person B) and emotions (fear or anger) were used. Participants were told to press a key for one person/emotion and another key for the other, as fast as possible. When the classification task was on one dimension, the other dimension was manipulated in three different ways. In one session, the other dimension was correlated (e.g., person A was always fearful and person B was always angry). Thus, the second dimension can help to respond to the first one. In another session, the other dimension was constant (e.g., person A and B were angry when the classification task was on identity, or person A was fearful and angry when the classification was on emotion). In this condition, no interference from the second dimension was expected for. Finally, in the third session, the

other dimension was orthogonal, i.e. both persons expressed both emotions. In this condition, participants had to recognize the persons whatever their expressions, and the emotions whatever the person who expressed it. In healthy subjects, an interference of identity in emotion classification was reported, with no interference of emotion in identity classification (Schweinberger et al., 1999; Schweinberger & Soukup, 1998). In schizophrenia, Baudouin et al. (2002) reported a similar observation: in this expemriments schizophrenic patients required longer time than controls to classify emotions when the identities were varied (orthogonal condition). Moreover, this interference was correlated with negative symptoms: the higher negative symptoms, the stronger the interference of identity in emotion classification. This observation was replicated in a second study by Martin et al. (2005), who also reported an interference of emotion in identity processing. The participants were presented with two faces displayed one after the other. The two faces came from the same person or not, and expressed the same emotion or not. With the same material, participants were required to perform two tasks in two different sessions. The instruction was the only difference between both tasks. In one task, participants had to tell whether the person was the same, in the other one they had to tell whether the emotion was the same. Martin et al. (2005) showed that schizophrenic patients performed worse than controls for both kinds of facial information. Mainly, their deficit was even more important when the other dimension was changed. More particularly, they performed at chance level when they had to match one emotion expressed by two distinct persons, and they had great difficulties in recognizing a person through two distinct emotional expressions (for a similar report, see Bediou et al., 2005). This deficit was correlated with negative symptoms of the SANS (Andreasen, 1982), more particularly with the subscale *attention*.

Attention certainly plays a critical role in the deficit for facial emotion recognition in schizophrenia. As Frith et al. (1983) already suggested, is appears that schizophrenic patients have difficulties to pay attention to the relevant dimension of face to extract facial information.

The Hypothesis of an Abnormal Visual Scanning of Face

The fact that patients with schizophrenia do not pay attention to relevant facial information can have consequences on the way they explore faces. The visual scanning of face follows a regular pathway in healthy: they focus on main features, making shift between the different facial components (e.g., eyes, nose and mouth, Walker-Smith, Gale, & Findlay, 1977). Since the early 90's, some studies have shown that schizophrenic patients exhibit an atypical visual scanning, distinct from this of healthy controls or other psychiatric patients (e.g., Abel, Levin, & Holzman, 1992; Lipton, Levy, Holzman, & Levin, 1983; Radant & Hommer, 1992). The observation gave rise to an increasing interest during the last decade (e.g., Gordon et al., 1992; Loughland et al., 2002; Loughland, Williams, & Harris, 2004; Phillips & David, 1997, 1998; Streit et al., 1997; Williams et al., 1999). The main conclusion is that schizophrenia is characterised by a restricted visual scanning of face. For example, Gordon et al. (1992) recorded eye movements during the exploration of a neutral face. They reported shorter fixations on features (eyes, nose and mouth) by comparison to controls. Streit et al. (1997) observed shorter saccades between fixations, and longer fixations. Phillips and David (1998) observed that schizophrenic patients made fewer and longer fixations.

Moreover, these fixations were less frequently on features. The restricted scanpath was sometimes linked with lower performances (e.g., Loughland et al., 2002; Williams et al., 1999), but not systematically.

Some authors have suggested that the restricted scanpath in schizophrenia is specific to face processing. Notably, Manor et al. (1999) recorded a restricted scanpath for a neutral face, but not for the Rey figure. Williams et al. (1999) did not observe any difference in the visual exploration of schizophrenic patients and controls when faces were degraded, whereas schizophrenic patients exhibited a restricted scanpath for nondegraded faces. Nevertheless, we have to underline that some studies recorded an abnormal exploration in schizophrenia for non-facial stimuli, like Rorschach inkblots (Minassian, Granholm, Verney, & Perry, 2005).

Thus, the deficit in facial emotion recognition tasks, and for any tasks involving face, can be explained by the fact that schizophrenic patients did not pay attention to relevant facial characteristics. This impairment may be associated to an abnormal visual exploration of facial attributes. Notably, schizophrenic patients pay less attention to facial features. Nevertheless, this last particularity is not the only one that distinguishes schizophrenic patients from healthy subjects. Schizophrenia is also characterised by shorter saccades and longer fixations. Thus, the dynamic of the exploration is also altered. Lougland et al. (2002) addressed the possibility that the deficit might reflect failure to integrate salient features, probably due to deficient local processing of relevant information and a dysfunction in the networks that synchronize local and global processing of face stimuli. According to this account, the abnormal visual scanpath of schizophrenics reflects over reliance on sequential visual search strategies, perhaps to compensate for an earlier problem in the configural processing of faces (e.g. relational or gestalt processing). Configural processing has been shown to be crucial for healthy participants to acquire facial expertise (for a review, see Maurer, Le Grand, & Mondloch, 2002) and facial expression recognition (Calder, Young, Keane, & Dean, 2000). In that way, Schwartz, Rosse, Johri, and Deutsch (1999) reported that control participants made more saccades of less than 50 ms to upright than to upside-down faces, and assumed that the processing of configural information was disturbed for upside-down faces. Schizophrenic patients did not differ across face orientations. Therefore a specific disturbance in access to facial configural information could account for the differences between the visual scanpath of schizophrenics and that of healthy or psychiatric patient controls. The restricted visual scanpath reported for both emotion processing and face recognition may reflect a tendency to pay more attention to some components of the face and less attention to information on configuration (Lougland et al., 2002).

The Hypothesis of a Deficit in Configural Processing of Face

It is possible that the schizophrenic patients recognize badly the emotion because of an inappropriate analysis of the characteristics of the face. In this frame, the scientific literature abounds in studies demonstrating the importance of configural information in face processing. A face, constituted by feature, can be perceived through the physical characteristics of these features, but also their relational aspects. It is a face only if the features have a certain arrangement: eyes above the nose, itself being above the mouth. If these relations, called first-order relations, are stable from a face to the other ones, the distance between the features, called second-order relations, is variable. They can so be useful for face processing. It even

appeared that this type of information is fundamental during the recognition of the face, certain authors considering that it is the base of our expertise (e.g., Diamond & Carey, 1986; Maurer et al., 2002). The weight of configural information was also demonstrated in the processing of the other kinds of facial information as for example the gender (Baudouin & Humphreys, 2006) and facial emotion (Calder & Jansen, 2005; Calder et al., 2000). Configural information was also distinguished according to two types: second-order relational information and holistic information (Calder & Jansen, 2005; Maurer et al., 2002). The first ones imply the fine perception of the distances between the features (for example, more or less close eyes). The holistic information refers to the perception of the face as a whole, a gestalt. According to some authors who proposed this distinction, the origin of our expertise for face would be our important capacity to process the second-order relational information.

At this time, only a few studies directly tested the hypothesis of a deficit in configural processing in schizophrenia. The results were divergent. Schwartz et al. (2002) reported several results that indicate that schizophrenic patients process configural information. They observed an effect of inversion for faces which tends to be stronger than that observed for houses. Such an observation is usual in healthy participants, and it indicates the configural processing of face (e.g., Yin, 1969). They also reported an interference of the counterpart when the schizophrenics have to pay attention to half of the face. Again, such a result is indicative of configural processing of facial information in healthy (Young, Hellawell, & Hay, 1987; see also Tanaka & Farah, 1993). In another study, Chambon, Baudouin and Franck (2006) also reported an inversion effect during a facial emotion recognition task. The inversion effect was as strong for schizophrenic patients as for controls. Together, these observations are in favour of a preserved ability to process configural facial information in schizophrenia. In that way, Schwartz et al. (2002) concluded that the deficit reported in schizophrenia can not be accounted for by an impaired configural processing of face.

Nevertheless, Chambon et al. (2006) also observed some particularities in schizophrenia that did not fit with the conclusion to a preserved configural processing. Notably, whereas controls shift their decision bias when emotion where displayed upside-down, schizophrenic patients did not; they adopted a similar pattern of decision bias for upright and upside-down faces. Furthermore, this pattern was similar to the pattern controls adopted for upside-down faces, i.e., when the processing of configural information was disturbed. More importantly, the size of the inversion effect depended on the severity of negative symptoms. The patients with severe negative symptoms did not exhibit any inversion effect. Chambon et al. (2006) have suggested that the main explanation to these observations is that schizophrenic patients do in fact process configural information, but in an incorrect way. It has been reported that some prosopagnosic patients (patients who are unable to recognize a person from their face) process configural information but incorrectly (e.g., De Gelder & Rouw, 2000). In this case, the problem does not result from the absence of configural processing but from the fact that the configural information extracted is of poor quality. In schizophrenia, an abnormal pattern of exploration of faces has been reported (e.g., Streit et al., 1997; Williams et al., 1999), as well as a composite effect (Schwartz et al., 2002). Thus, schizophrenic patients would extract configural information, and this information automatically interferes with the processing of local part of the face. But the extracted configural information will be of low quality in schizophrenia, due to an inappropriate exploration of faces.

Another explanation emerges from the consideration of the different kinds of configural information, notably in the distinction between second-order relations and holistic

information. The paradigms used by Schwartz et al. (2002) and Chambon et al. (2006) may have been more sensitive to holistic information than to second-order relation (see Maurer et al., 2002). Maybe the abnormal visual scanning of face impairs the processing of the last kind of configural information, holistic information being extracted rapidly and automatically without any need of facial exploration. We tested this hypothesis in a study where second-order relations were directly manipulated (Baudouin, Vernet, & Franck, unpublished data). Participants were presented with two similar side-by-side faces. The only possible difference between the two faces was the distance between eyes, some faces having close eyes, some other having apart eyes, with different intensities. Thus, the two side-by-side faces differed only on the basis of a second-order relation. The purpose of the study was to compute the minimal distance participants were able to discriminate. The results showed that schizophrenic patients needed a distance that was two times more important than controls.

This last study allows us to conclude that schizophrenic patients are impaired in the configural processing of faces, more particularly for one type of configural information: second-order relations. The well-described abnormal visual scanning reported when schizophrenic patients explore faces appears to have incidence on the information these patients extract from face. Notably, as suggested by Loughland et al. (2002), schizophrenic patients exhibit a breakdown in the neurocognitive strategies that underline the processing of face. More precisely, the way they explore faces does not allow them to process second-order relations in an efficient way. Many aspects of their pattern of visual scanning can explain this deficiency. The fact that they do not focus on features may disrupt the processing of distance between them. Another aspect of their particular visual scanning is their tendency to do shorter saccades together with fewer and longer fixations. This can traduce an analytic strategy consisting in the extensive exploration of local aspects of face. Such a strategy would be used to the detriment of the processing of the relational properties between local aspects of faces, this processing involving saccades from one feature to another. The persistence of a composite effect in schizophrenia (Schwartz et al., 2002) may reflect the fact that holistic information does not need the active exploration of the face. We are able to encode and recognize a face or facial emotion despite very short presentation, preventing any saccade (e.g., Baudouin et al., 2000a, 2000b, 2002). We are also able to recognize a face through very low spatial frequencies, when its local and fine properties can not be extracted, but the broad location of features can be perceived (e.g., Bachmann, 1991; Harmon, 1973; Sergent, 1986). One may thus suggest that broad holistic information of face is extracted automatically through the global processing of low spatial properties of faces, without involving the exploration of the face. Then, local and relational properties will be extracted in a finer manner by an active exploration of facial characteristics, with different neurocognitive strategies allowing the extraction of both kinds of facial properties. Local properties are processed by focusing on facial parts, relational properties are extract thank to passing from feature to feature. The deficit of schizophrenic patients appears to result from impairment in the implementation of strategies for relational properties.

NEURONAL SUBSTRATE OF FACE AND AFACIAL EMOTION RECOGNITION AND ITS ALTERATION IN SCHIZOPHRENIA

Neural Bases of Face and Facial Emotion Recognition

Many cerebral regions are implied in the processing of facial information. Haxby, Hoffman, and Gobbini (2000) proposed a model that detailed some of these regions. In their model, a core system allows the perceptual analysis of face. This core system starts by performing an elementary analysis of facial features the in inferior occipital gyri. After this first step, two pathways process the different characteristics of face. One pathway, in the superior temporal sulcus, is involved in the processing of changeable aspects. The decoding of these aspects is crucial during direction of gaze processing, facial emotion recognition, or lip reading. The second pathway, in the lateral fusiform gyrus, processes invariant aspects of face, such aspect allowing recognising the person. After this core system, distinct systems process the different facial information, using as inputs the information that is relevant for them. For example, the anterior temporal cortex is involved in identification, and is based on inputs from the lateral fusiform gyrus, i.e. invariant facial aspects. Facial emotion recognition is processed by the amygdala, the insula, and the limbic system. Their relevant inputs are changeable aspects extracted by the superior temporal sulcus. More recent review described other regions for facial emotion processing, like the ventral striatum, various regions of the cingulate gyrus and of the prefrontal cortex (see Phillips, Drevets, Rauch, & Lane, 2003a).

Until recently, it was widely believed that the different regions are modular and independent (e.g., Bruce & Young, 1986). Nevertheless, many recent studies suggested that the independence of these regions is not so clear-cut, some interactions being possible (see Calder & Young, 2005; Tiberghien, Baudouin, Guillaume, & Montoute, 2003). For example, Dolan et al. (1996) showed that regions implicated in the processing of faces (e.g., the right fusiform gyrus) are more activated during the processing of an emotional face than during the processing of a non-emotional face. Morris et al. (1998) presented neutral to fearful faces during a gender categorisation task. They reported that the level of activity in the amygdala allows predicting neural activity in extrastriate cortex (see also Sergent, Ohta, MacDonald, & Zuck, 1994). Another example comes from the study by Young et al. (1996) who tested a woman with a partial bilateral amygdalotomy. She was impaired in quite any tasks involving facial emotion, with no problem in most tasks involving identity. There was one exception for identity tasks; she had problems when simultaneously presented images showed the same face with two different expressions. Thus, her deficit for facial emotion leaded her to mistake differences in expression for a difference in identity. Considered together, these data show that the different regions that process face interact.

Neural Substrate of Face Processing in Schizophrenia

Even if cerebral functioning during face processing remains largely unknown, it has been clearly shown that a face will activate many regions that will work in interaction. We will focus on three regions: the limbic system (more particularly, the amygdala), the temporal cortex and the (pre)frontal cortex. The limbic system is involved in facial emotion processing,

the second in face recognition, the third in task monitoring and attention. It was already shown that these regions work in interaction during the processing of facial information (e.g., Rajah, McIntosh, & Grady, 1999). Abnormalities were also reported for some of these regions in schizophrenia.

The amygdala is probably the cerebral structure that was most frequently associated with the deficit in facial emotion recognition in schizophrenia (for reviews, see Phillips, Drevets, Rauch, & Lane, 2003b; Van Rijn, Aleman, Swaab, & Kahn, 2005). Schizophrenic patients had smaller amygdala/hippocampal complex volumes (e.g., Breier et al., 1992; Gur et al., 2000). A reduction of amygdala was also reported in high-risk persons (for a review, see Van Rijn et al., 2005). Furthermore, the activity of the amygdala is lower in schizophrenic patients when presented with emotional material, including faces (e.g., Gur et al., 2002; Hempel et al., 2003; Schneider et al., 1998). Hempel et al. (2003), for example, found a decreased activation of the amygdala-hippocampal complex during a facial emotion recognition task. The conclusion to these observations was that the deficit of facial emotion recognition in schizophrenia results from the alteration of amygdala/limbic system functioning.

Schizophrenia is not associated with a totally dysfunctional amygdala. Schizophrenic patients present a reduction of the overall volume, what can allow a residual functioning of this region. In other words, a schizophrenic patient is not a patient "without" the amygdala system, but with a system that is reduced and, probably, that do not work efficiently.

A complementary hypothesis could be a deficit in inhibition. The decreasing of the activity caused by the effect of a repeated presentation of stimuli is a fundamental characteristic of cerebral plasticity. For example, the activity of many medial temporal regions decreases when emotional stimuli are displayed (Breiter et al., 1996; Fischer et al., 2003; Phillips et al., 2001; Wright et al., 2001). Some authors suggested the deficit in schizophrenia results from an abnormal modulation of activity in some cerebral regions, including limbic circuits or temporal and hippocampal regions (e.g., Freedman et al., 1996; Frith, 1979; Holt et al., 2005). The amygdala is certainly implied in the deficit reported in schizophrenia. Nevertheless, the abnormal modulation described by some authors (e.g., Holt et al., 2005) may indicate that some other regions are also involved; if some regions modulate temporal, amygdala and limbic activations, they do not perform their usual function in schizophrenia.

As a candidate for cerebral structures that modulate limbic or temporal activity, the frontal lobe is often considered for playing a role of modulator and it is connected with several regions of the temporal lobe, of which the amygdala. Grossberg (2000) postulated moreover that the dysfunctions of the amygdala result in a dysfunction of other brain regions of which the prefrontal cerebral cortex. This dysfunction would be explained by a decrease of the projections between both regions; animal models show that an early damaged of the amygdala in rats provokes a limitation of the innervations of the prefrontal cerebral cortex in the adulthood (e.g., Bouwmeester, Wolterink, & Van Ree, 2002). Abnormalities of the functioning of the frontal lobe, and more particularly the prefrontal cortex were also frequently underlined in schizophrenia (e.g., Buchsbaum, 1990; Schröder and al., 1994). As for the amygdala, a decrease of the volume of frontal regions was evoked (e.g., Farrow and al., 2005) and, even if this decrease remains to establish because of contradictory observations, the activity of the frontal cerebral cortex is lower for schizophrenic patients compared with controls (for a review, see Mitchell, Elliott, & Woodruf, 2001). Furthermore, involment of the frontal cerebral cortex in processing facial information were reported (e.g.,

Allison, Puce, Spencer, & McCarthy, 1999; Guillaume & Tiberghien, 2001; Marinkovic & al., 2000). A weak activity of frontal regions during emotion processing was also already reported in schizophrenia (Gur et al., 2002). This decrease, far from being specific to face or to emotion, concerns a wide range of tasks. It is generally associated to a deficit of executive functions such as rules management, reasoning, and selective attention.

Beyond a simple dysfunction of some limbic or frontal regions, the deficit of facial emotion recognition in schizophrenia can also be explained by abnormalities in the communications between the frontal regions and the limbic system or the other temporal regions. Fronto-temporal abnormalities were already used to explain several deficits in schizophrenia (for a review, see Mitchell and al., 2001). The role of these interactions in healthy subjects having also been hypothesised during face processing (Rajah et al., 1999), their dysfunction could explain the deficit in facial emotion recognition in schizophrenia. Such a hypothesis was already proposed by William et al. (2004) and must be tested further.

CONCLUSION

One of the main points highlighted by this review is that schizophrenia is characterized by a severe deficit in the recognition of the emotional state of peers. This deficit is obvious when the feelings are communicated by means of the facial expression, but also by means of other modalities. This observation echoed on the social functioning of the individuals suffering from this disease and in particular on the deficit in the communication of their own emotional state. The consequences of this deficit are particularly dramatic since deficit is usually stable trough time; it is present from beginning of the disease, some data suggesting that it is also present, with a lesser intensity, in persons having a strong risk of developing schizophrenia. The release and the installation of the disease are related with an aggravation of this deficit but not with its apparition. The deficit is also probably exacerbated during some phases. Antipsychotic medications allow only a very moderate improvement of this impairment. More generally, antipsychotics detemerine generally a benefit in social functioning of patients with schizophrenia.

The reason of the deficit is probably multiple. Several functions were questioned. It could involve a deficit of general cognitive functions, more particularly attention and abstraction abilities. Impairment at the level of visual exploration was also reported. It could finally result from a deficit of particular mechanisms involved during the processing of facial information. More particularly, it seems that the extraction of configural information, mainly second-order relations, is altered in schizophrenia. Finally, the deficit could result from the combination of these alterations that, in a sort of chain reaction, would disrupt the recognition of facial emotion. The deficit of attention capacities, more particularly the capacity to pay attention specifically on a piece of information independently of the others, has as consequence that patients did not sufficiently elaborate the processing of facial information. This impairment is accompanied by an abnormal visual scanning of the face, resulting in an impaired processing of second-order relations.

About the neural basis of the deficit, many regions were involved, and probably each of them plays a significant role in the deficit. Among these regions, the abnormal functioning of limbic system, more particularly of the amygdala, and of frontal or prefrontal regions explains

part of the deficit in facial emotion recognition. Nevertheless, the explanation may be based not only on the alteration of these regions, but also on the impaired connectivity between them.

Thus, despite an abundant literature on schizophrenia, many questions remain open and many hypotheses have to be tested furthermore. The understanding of schizophrenia, the comprehension of the cause of their deficit in facial emotion recognition and of the link between this deficit and the deficit in social function will certainly give raise to many other hypothesis, studies and explanations. Nevertheless, the scientific work could be facilitated by considering some aspects of patients with schizophrenia; the high heterogeneity of this population, notably in the expression of symptoms, and the high interactivity of brain regions sustaining face and emotion processing

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Chapter 2

THE IMPACT OF FAMILY FACTORS ON PEER-SELECTION AND DELINQUENT ACTIVITY. AN ATTEMPT TO ROUTE THE PATH FROM FAMILY MATTERS TO DELINQUENCY AMONG ADOLESCENTS IN A SCANDINAVIAN SAMPLE

Folkvard Nævdal*
Bergen College, Faculty of Education,
Postboks 7030, Bergen, Norway

ABSTRACT

The article discusses a range of statements and questions extracted from previous researches related to the relationship between family factors and delinquent behavior in adolescent.

Six expectations related to certain family factors' asserted impact on the process towards delinquent participation are formulated and designed for testing. Parental attachment and knowledge about the adolescent's whereabouts, peers and activities are seen as basic family qualities. Peer-selection and peer socializing are regarded to be a central links between the family area and delinquent acts. The explanation power in theoretical approaches is discussed.

The study is based on survey data from Bergen, the second largest town in Norway. Data were collected in spring 2002. Questionnaires were sent to 930 adolescents from selected schools, aged 15-16 year – in their last term in secondary school (Spring).

Six hundred and fifty nine pupils fulfilled the questionnaire (71 %). Family structure, parental attachment qualities, parental knowledge, peer-selection, adoption of deviant

* Corresponding author: Folkvard Nævdal, Bergen College (HiB), Faculty of Education, Postboks 7030, N-5020 Bergen, E-mail: fne@hib.no

norms (morality), and delinquent acts/ behavior constituted the main themes and variable constructions.

Differences between traditional families (two parents) and alternative arrangements (one natural parent or neither of them) were found for financial situation at home, attachment qualities, psychological adjustment, parental knowledge, peer-selection, adoption of deviant norms and delinquent behavior. Family structure explained a unique part of the variance in delinquent behavior even after controlling for all other variables of relevance. Parental attachment qualities strongly predicted parental knowledge, but high level of the adolescent's feeling of being controlled, increased the probability of low level of parental knowledge. Family structure, attachment and knowledge predicted direct and indirect the adolescent's peer-selection that in turn was strongly related to delinquent behavior.

INTRODUCTION

It is widely believed that children who are raised by both their biological parents are less likely to become involved in delinquency than children raised in alternative family arrangements.

Although there is a general consensus that non-traditional family structures are at risk, the causal mechanism in this frequently found relationship between family structure and adolescent delinquency is not generally clear (Kierkus & Baer, 2002). Two partly overlapping theoretical concepts are frequently employed to explain this connection: social control theory (Sampson & Laub, 1994) and strain theory (Agnew, 1999). Social control theory stresses the disorganization of a system like the family, and focuses on the parent's reduced ability to sustain contact with their children's activities outside the home, and to maintain and develop a positive parent child-attachment. Positive emotional bonds or parent-child attachment are important preconditions if the parent is to effectively maintain social control in terms of having the parents psychologically present which will restrain a child from engaging in delinquent act. The role of parents' involvement or attachment in this process has lately been reformulated by posing involvement as a social setting variable and a differential factor (Sampson & Laub, 1994; Agnew, 1999; Wong, 2005). Wong's reformulation (Wong, 2005) of Hirshi (1969) may be generalized to also contributes to an explanation of the link between peer affiliation and delinquency additionally to social learning theory (Bandura, 1973) where aggressive and delinquent behavior in certain peer groups may give status rewards and reinforcements, but why children from intact families should prefer delinquent peers is still to questioned. Persson, Stattin and Kerr (2004) suggested that conflicts and stress at home may make the child aggressive and more likely to be rejected by ordinary peers (Laird & al, 2005).

Strain theory is not limited solely to social control and control efficacy, but includes the psychological reactions and adjustments to the strain itself. Agnew (1999) maintains that it is strain related to material resources and emotional distress that lies at the root of the problem.

Some recent studies carried out in Sweden (Hansagi, Brandt and Andreasson, 2000; Weitoft, Hjern, Haglund & Rosén, 2003), Finland (Mäkikyrö, Sauvola, & Moring, 1998; Sauvola, Räsänen, Joukamaa, Jokelainen, Järvelin & Isohanni, 2001), and Norway (Breidablikk & Meland, 1999; Naevdal & Thuen, 2004) indicate rather large differences in health and well-being between children and adolescents living with one of their parent as

compared to living with both parents, questioning the moderating effects of the economical support and social services available in these countries. These finding may indicate that the strain goes beyond the question of parenting efficacy. In current study the psychological well-being therefore will be brought into the analysis model. Cherlin & al (1991) claimed, based on longitudinal studies that family difficulties before the separation or divorce explained in large measure the apparent effect of parental break-up on children, but long termed effects of non-intact family on well-being of the affected children remains to be documented (Amato & Keith, 1991)

Studies of the relationship between family structure and delinquency have not been consistently and clearly defined with respect to their theoretical foundations. Researchers in this field have generally been eclectic and empirical in their approaches, combining several perspectives. Typical Blau & Blau (1982) stated that family disruption is a major source of strain, as well as low social control (p.124)

Gringlas & Weinraub (1995) claimed that the observed differences between children living with one parent and those living with two could be explained by the lack of resources in one-parent families. This includes both economical and social deprivation, since those who have to manage alone often experience both reduced access to support and opportunity for involvement (DeMaris & Geofferey, 1992; McLanahan & Sandefur, 1994). Yet another contributing factor is raised by Patterson (1988), who maintains that distressed mothers are more likely to use coercive discipline and thereby contribute to the development of antisocial behavior in their children.

Some researchers have suggested that the parental attachment component of social control theory can explain why children from non-traditionally families are more likely to commit delinquent acts than those from intact families (Sampson & Laub, 1994; Adlaf & Ivis, 1997). When testing this hypothesis Kierkus & Baer (2002) found that the relationship between family structure and delinquent behavior was not statistically significant when the findings were controlled for parental attachment. In contrast, a longitudinal study by Chen & Kaplan, 1997) revealed that the direct effect of family structure on deviance remained significant, even after the significant mediating processes during adolescence were taken into account.

Moreover, the findings related to adolescents differ according to whether the mother or the father has custody. Buchanan e& al. (1996) found that the attachment factor was stronger if the custody parent was the mother rather than the father. Similarly, Naevdal and Thuen, (2004) found differences in several features between mother-headed and father-headed families; in the latter, the children seemed to be at risk of developing a range of problems, including drug usage, school failure, conflicts at school and delinquent behavior. The authors suggested that these differences can be explained in terms of the family history and the separation process, which granted the fathers custody of the child in spite of the fact that this is a society where maternal custody is the standard. Unfortunately, parental attachment was not included in this analysis.

Another focus of research has been the gender of the child. Some studies have concluded that family disruption may have a greater impact on girls than on boys (Steinberg, 1987; Anderson, Holms and Ostresh, 1999; Dunn et al. 1998; Bachman and Peralta, 2002);

Other studies have come to the opposite conclusion (Needle, Su & Doherty, 1990). In addition, studies have been made of the significance of the similarity in sex between the child and the custody parent (Sandtrock & Warshak, 1979), and gender differences in the

experience of and the response to family strain (Hay, 2003); empirical evidence generally supports the conclusion that there are few difference between children in the custody of their mother or father, whether they are boys or girls (Buchanan, Maccoby & Dornbusch, 1996; Downey, 1994; Downey et al, 1998).

Another variable that has been studied is the role of step-parents both as positive and negative factors in relation to the development of delinquency during adolescence. A wide range of differences between families has been found regarding the impact of a step-parent. These differences have been related to the family history, economy, networks and so on (Dunn et al. 1998). It cannot be taken for granted that an adolescent will accept the step-parent's tracking and care as legitimate (Fine, Coleman and Ganong, 1998). Families that include a biological father and a stepmother appear to be particularly deficient in this respect (White, Brinkerhoff and Boot, 1985). A step-parent's presence will not be included in the current study as part of the family structure.

Parents are expected to know their children's whereabouts, activities and playmates. As children grow older, they begin to spend more time outside of direct adult supervision or monitoring. According to Dishion and McMahon (1998), parental monitoring is conceptualized as "... a set of correlated parenting behaviors involving attention to and tracking of the child's whereabouts, activities and adaptations" (p.61). A correlation has been found between lower levels of monitoring and knowledge, on the one hand, and involvement in range of antisocial and delinquent behaviors, on the other (Cerkovich & Giordano, 1987; Fletcher, Darling and Steinberg, 1995; Dishion and McMahon, 1998; Mounts, 2002).

The definition of the monitoring concept employed above does not make any distinction between functional and dysfunctional monitoring, but both cross-sectional and longitudinal studies conclude that poorly monitored adolescents tend to be antisocial, delinquent, or criminal (see Crouter, McDermid, McHale & Perry-Jenkins, 1990; Winetraub & Gold, 1991; Sampson & Laub, 1994).

Evidence also suggests that poorly monitored youths have deviant friends (Dishion, Capaldi, Spracklen & Li , 1995), and that they may become delinquent because of this peer affiliation (Fridrich & Flannery, 1995). The link between involvement with deviant peers in adolescent, on the one hand, and delinquency, drug use and a range of other problematic behaviors, on the other, is well documented (Snyder, Dishion & Patterson, 1986; Vitaro, Brendgen & Trembly, 2000; Laird, Pettit, Dodge & Bates, 2005). This link can be explained by social learning theory where imitation, values and reinforcement are well known cues. But this friendship and the group members' behavior may also be individual and cultural approached like Fleisher (2000) described the processes. Persson, Kerr & Stattin (2004) looked at the development of deviant behavior as a consequence of peer socializing and adoption of the peer- group's values and norms.

Amato (1993) argued that parental divorce brings about a decrease in quality and quantity of contact with non-custodial parents, and the custodial parents are also greatly constrained as most of them have to work to support their families. Thus, they are at a more disadvantaged position in monitoring their children and providing restrictions on their association with deviant friends.

The purpose of parental monitoring is to obtain knowledge. This knowledge can be acquired by cross-examining and demanding information from the children, by actively tracking them or by simply becoming involved in the children's interests and well-being, and thereby establishing a parent-child relationship based on honesty and disclosure. Kerr and

Stattin (2000) claimed that parents' efforts to control and monitor their child were related to good adjustment only after the child's feeling of being controlled was partially laid to rest. Active control and surveillance efforts, in isolation, were found to be risk predictors if the child experienced them as a sign of distrust and lack of confidence, particularly when followed up by coercive actions by parents. Wright and Cullen (2001) are more nuanced in their conclusions when they claim that control and support are closely intertwined.

The association between monitoring, knowledge and delinquent behavior seems to be quite complicated and interactive (Crouter, MacDermid, McHale & Jenkins, 1990; Kandel & Wu, 1995; Aseltine, 1995; Barber, 1996; Jang & Smith, 1997; Stattin & Kerr, 2001). Dishion and McMahon 1998) postulated that adolescents' antisocial behavior reduces the quality of the parent-child relationship, thereby reducing the quality of monitoring, that in turn reduces the knowledge. This process will result in a gradually decrease in parental influence, and increase the risk of delinquent involvement. Monitoring is most often measured in terms of the parents' knowledge about the child's whereabouts and friends (Wintraub & Gold, 1991, p.272). This knowledge, therefore, may be considered the finale outcome of any effort exerted in order to obtain it. Stattin & Kerr (2000) maintained strongly that the way parents gain their information is not a matter of no concern; they found that higher levels of child disclosure corresponded to lower levels of norm breaking, independent of parental solicitation and control (p.1078).

Difficulties within the parent-child relationship and children's enclosure may be an important mechanism linking antisocial behavior to parents' knowledge, and thereby to lower levels of information provision on the part of the children regarding their whereabouts and activities (Sampson & Laub, 1994; Kerns, Aspelmeier, Gentzler & Grabill, 2001). According to Stattin and Kerr (2000), lack of voluntarily provision of information cannot be replaced successfully by active tracking and control if the goal is to reduce norm breaking and delinquency.

In addition, the adolescent's own belief in the legitimacy of parental control or the parent's right to knowledge about their private affairs must be taken into account (Smetana & Daddis, 2002). Adolescents' belief in the legitimacy of parental control has been found to decrease in the course of adolescence, suggesting that these beliefs may reflect the adolescents' growing need for autonomy (Smetana & Asquith, 1994; Fuligni, 1998). Weaker beliefs were found to be related to increases in monitoring knowledge over time. (Laird, Petitt, Dodge & Bates, 2003).

If the adolescent is involved in delinquent activities, his or her resistance to parental monitoring will probably increase, and the parents' access to information, and therefore knowledge, will be impeded (Dishion & McMahon 1998). To justify the denial of access, the youngster could claim his right to privacy and construct a latent conflict that would be activated whenever the parents' make an inquiry or express their worry (Stoolmiller, 1994).

Although the delinquent act may reduce parental knowledge, Laird & al.(2003) suggested that the knowledge comes first and is strongly linked to the time parent and child spend together. Thus, parental monitoring and knowledge are not constants depending solely on family structure, parenting style or parents' behavior. The quality of the interaction is more fluid, adapting to changes in the adolescent associates with growing up; to changes in the situation in the family, such as stress and strain, structure, resources, events and conflicts; and to changes in outside influences, such as school and deviant friends. Nevertheless, children and adolescents should not be viewed mainly as passive victims of circumstances (control and

strain), but also as active and initiating participants in relationships within a range of ecological fields including home, school and peer forums. In addition, they must also be viewed in relation to the macro society norms, as expressed in personal opinions and sub-cultural discourses. Finally, account must also be taken of genuine individual factors such as genetic and intellectual characteristics and mental disorders that may result in an early onset of deviant behavior (Moffitt and Caspi, 2001; see also review, Hill, 2002)

The purposes of current study is to detect whether this and other statements in this actual issue are supported in a society (Norway) where single parenting is becoming normal and the economical support and social services are available in a great extent. Further the intention is to explore the relationships between family structure, attachment and parental knowledge as these appear to be related to each other and to delinquent behavior. Parental knowledge is supposed to be the best predictor to peer-selection and adolescent delinquency, and these relations will therefore be examined to look for the peer-selection's role and influence in the process towards delinquent acting. The new variable entered originally in this study is an assessment of deviant socializing (Naevdal, 2005). The measure was constructed to detect acceptation and idealizing of gang behavior in groups of adolescents.

The data set on which the current study is based does not allow an full analysis of all these multi-level interactive processes, but may support, identify and modify some of the divergences in risk and resistance factors in relation to the traditional two-parent families versus alternative arrangements and the mediating factors within and outside the core family.

The theoretical assumption is that conflicts, negative or loose bonds and low attachment between child and parent may set in motion the child's drift towards alternative relationships ; for example, connections with other adults, a single peer, or a peer group, or a romantic interest. This process should not be considered simply as a consequence of reduced control, but equally as a search for an alternative, accessible relationship of belonging. Thus, identity processes and strategies may be relevant for our understanding of the process (Breakwell, 1986). In the above mentioned longitudinal study by Chen & Kaplan (1997), four dimensions, in addition to delinquent behavior, were identified as being affected by family disruption: 1) parent-child relationship, 2) subjective distress, 3) association with deviant friends, and 4) commitment to conventional values. The variable categories in current study are intended to reflect these dimensions.

The hypothesis in the following study is that the variables of non-traditional family arrangement and parent-child attachment mainly predict an affiliation with deviant peers; and that delinquent behavior is much a result of peer affiliation (pressure and reinforcement), and the deviant norms, attitudes and behavior associated with peer socializing. The model below (figure 1) illustrates the hypothetical path from family structure (1) to delinquent behavior. The direct effect of family structure (1) is expected to be weakened as other factors are introduced into the model - including the relationship between parent and child (2) and the child's adjustment to the strain (3). These, in turn, influence the drift towards deviant peers (5) and delinquency and delinquency is mainly mediated by the level of peer deviance and norm adoption.

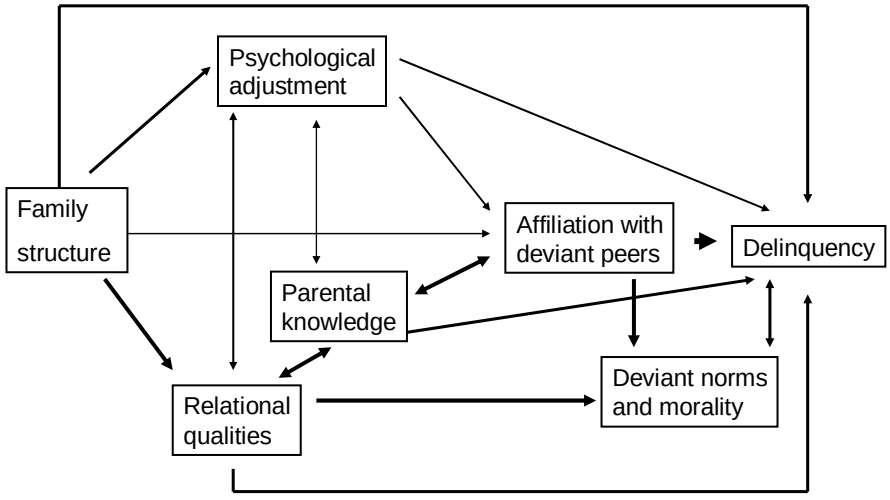


Figure 1. Model of expected paths between central dimensions that may influence on the Process towards adolescent delinquency.

Membership in a deviant group may encourage adolescents to change their values, or to accept or even idealize deviant behavior and norms (morality). One of the questions then becomes whether family structure contributes directly to delinquency at a significant level when the data is controlled for the deviant group membership and the socialization into deviant attitudes and behavior.

As a conclusion on preceding research reviewing and theoretical speculations, six expectations can be extracted. These expectations will in the analysis be tested as H^0-statements. To construct a path analysis according the theoretical model (fig.1) the numbers of variables are reduced to the essentials by stepwise regression (fig 2).

1) There are massive empirical indications of statistical differences between traditional families and alternative arrangements regarding delinquent behavior, i)Financial situation at home, ii)Parent-child attachment, iii)Psychological adjustment, iv)Parental knowledge, v)peer selection, Adoption of deviant norms (socializing) and delinquent acts among adolescents. (see 1- H^0)
2) The relation between family structure and parental knowledge are mediated by the parental attachment variables. By controlling for the attachment the correlations between structure and knowledge are expected to be reduced or eliminated. (see 2- H^0)
3) Parental knowledge is found to be the best predictor to adolescent peer-selection and delinquency. Parental knowledge predicts peer-selection and delinquency at different levels among girls and boys (Jakobson & Crockett, 2000; Laird & al, 2003) (see 3- H^0)
4) According to Agnew (1999) the psychological strain related to family disruption (conflicts between parents and uncertainty over time) will cause reduced well-being or psychological symptoms as much as the economical hardship and reduced

attachment (Barber & Eccles, 1992; Amato & al., 1995; Cherlin & al.1991) A unique part of the variance of psychological symptoms is therefore expected be explained by family structure after having controlled for all the variance explained by the attachment variables. (see 4- H^0)

5) Family structure is expected to contribute uniquely to the drift towards deviant peers even after gender, financial situation, attachment variables and parental knowledge are being controlled for by hierarchical regression- and change analysis. (see 5- H^0)
6) Some empirical findings indicate that there persist a unique and direct relation between family structure and delinquent acts even after the potential impact from gender, the economical situation, psychological symptoms, attachment, peer selection and deviant attitudes are controlled for by hierarchical regression and change analysis. (see 6- H^0)

The main perspective in this study is that family structures and relational qualities primarily contribute to the drifting towards deviant peers that in turn provides the child's opportunity to be socialized into deviant norms or the peer group's morality. The adolescent's behavior should be influenced by peer's pressure and norms in a changing identity process.

The study will be modeled as a path analysis using hierarchical regression models to detect the family structure's direct and indirect prediction towards delinquency when all relevant relationships are tested.

METHOD

The present study is designed as a survey and is part of a more comprehensive study that measures a wide variety of issues related to adolescents' life situation in Bergen, the second largest city in Norway. Ideally, the sample should represent all youth in the 10^{th} class (15-16 years old) in the city of Bergen. The sample was drawn from inner city as well as suburban and rural schools within the county boundary (10 schools). Data collection took place in the spring of 2002 (April), when the students were starting their last semester in upper-secondary school. Parental permission was required and standardized procedures were developed to ensure anonymity.

Data collection was administrated by the county education office in Bergen. None of the selected schools refused to participate. Questionnaires were sent to 930 pupils in the selected schools. The students were given two hours to fill in the anonymous questionnaire which contained general questions related to personal characteristics, family life, school, and leisure time.

Of the sample of 930 pupils, 659 participated in the study. The Norwegian Data Inspectorate demands positive (opt in) permission from the parents, which was not obtained for 152 students, who were therefore excluded from participation. In addition, some classes were lost due to difficulties with organization on the day of data collection (excursions, etc.) and some students were randomly absent. Seventy one percent of the sample participated; 329 girls and 327 boys completed the questionnaires in full.

Relevant variables for the actual research questions were constructed as follows:

Family structure is here constructed as four dichotomies named as was established on the basis of 4 dichotomies i) two-parent families, ii) mother headed, iii) father headed and iv) neither of the natural parents. In addition, the step-parent situation was defined as living with one natural parent and one stepparent, either a stepmother or a stepfather. The students were asked if they were living with both their natural parents, and if not, with which, mother or father. They were also asked if they were living with a "step". The two-parent family is identical to the intact natural family and was dummy-coded as 1= intact (two natural parents) and 0= one natural parent or neither. Mother headed is coded the same way (1= natural mother) and father headed is coded 1= natural father. In addition, the stepparent situation is coded 1= step mother or step father reported. As was anticipated for a Norwegian sample, paternal custodies were rather seldom (n=41), as was the number living with neither of their natural parents (n=19). These groups were rather small and since the aim of this study stressed the differences between traditional and not-traditional family structures, the main analysis included only two structural characteristics: 1) Two-parent (n=459) or not (n=200). When family structure is constructed as separate dichotomies, it is possible to use regression analysis models.

Socio-economic position was measured rather simply by asking the participants to rate their family's economic situation on the scale of: (i)Very bad, (ii) not good, (iii) average, (iv) better than most others, (v) very good.

Parental knowledge was established with reference to four statements rated as (i) Strongly agree, (ii) Partly agree, (iii) Don't quite agree and (iv) Strongly disagree. The statements concerned parental knowledge about participants' week-end activities, friends and whereabouts on weekdays. For example: "The adults at home usually know what I am doing at the week-end;" "The adults at home know most of my friends;" "The adults at home know the people I usually hang out with;" and "The adults know the ones I usually visit very well." The internal reliability of the four items was tested (Chronbach's Alpha = .82). Factor analysis indicated that one factor explained 65 % of the items' variance. This factor serves as the variable "Parental knowledge" and, in accordance with Stattin and Kerr (2000), is not regarded as an indicator of monitoring.

Parental attachment included the factors of thrust and authority, disclosures by the child and his/her feeling of being controlled or supervised. These qualities were assessed in twelve attachment items and ranked in the same way as parental knowledge. For example: "I thrust in my parents and know they will support me if necessary;" "They are interest in me and my opinions;" "I often lie to them about where I have been and what I have been doing;" "They are easily taken in;" "They want to supervise me all the time;" "They let me make my own choices;" etc. The internal reliability of the twelve items was tested (Chronbach's Alpha = .82). Factor analysis (Principal components, "oblimin" rotated) resulted in three components (Eigenvalue >1) that fully matched the theoretical structure, and that together these explained 61 % of the total variance. Trust and authority, (Fac. I) explained 41% of the variance. The feeling of being controlled or supervised (Fac. II) explained 11% of the variance, and children's disclosures (Fac. III) explained 9 %. The factor scores serve as variable values in the analysis.

Of the sixteen items related to the youngsters' relationship with their friends and groups of friends, two items indicate norm conflicts between the youths and society other groups, and were formulated as follows when talking about groups of friends: " The police are sometime after us" and "We are in conflict with other youths". These two items are strongly correlated

(r = .72) and both are ranked (1-4) as (i) Strongly agree, (ii) Partly agree, (iii) Don't quite agree and (iv) Strongly disagree. Two more questions were included. One of these dealt with sexuality; How common is sexual intercourse among your friends? Scaled as i) not at all, ii) for some of them, iii) for most of them, iv) quite common. The last item focused drug usage in the actual peer group (Does some of your friends use some kind of drugs like… (examples written), and the item was scaled; i)never, ii)seldom, iii)some times, iv)often. The scaling of all four items was transformed into z-scores. The variable's value is the mean sum of these four items. Internal consistency was Alpha= .84

Another important attribute measured was the internalization or level of acceptance of the deviant group's morality and norms. This is indicated by the APV-score (Naevdal, 2005). This assessment measures the youngster's acceptation and idealization of violence and gang behavior and includes defense, revenge, honor codex, affiliation and acceptance of extreme violence. This can be regarded as the core of gang morality. This assessment is briefly described based on a sample of Norwegian 15-16-year-olds (N=1728). Violence acceptance was originally constructed for screening of attitudes towards the use of violent strategies, and is analysed fully in a separate paper (Nævdal 2002). The scale consists of 11 items and ranges from 25 - 100 scale points, and measures the level of activity regarding defence, revenge and extreme methods (weapon use). For example: "You can beat up people who're asking for it". "You do not kick people that are lying on the ground, even if you think they deserve it". "It's okay to use a weapon when fighting". Factor analysis (Principle Component, "varimax" rotated), indicated that two factors explain 53,6 % of the variance. The first factor is related to defence and revenge and the second to the method dimension. Internal reliability was Alpha = 85.6.

The depression symptom scale included 20 selected items based on Hopkins' Checklist (Derogates & al. 1974). Five of the items deal with psychosomatic issues, the rest with anxiety and with a depressive outlook regarding oneself, the world and the future (affective). Internal reliability was Alpha = .88. Factor analysis resulted in four factors (Eigenvalue >1) in accordance with the theoretical dimensions: i) General emotional, ii) anxiety, iii) physical resistance/ general pains and iv) tension / muscular pain). For this study the total scale score (25 - 100 score points) will be transformed into the standard score format (z-score).

Delinquent behavior is modeled as the main dependent variable, and is constructed as simultaneity regarding various delinquent acts. Respondents were asked to indicate how often they had committed any of these acts during the current school term. Fifteen acts were listed and rated as (i) never, (ii) once, (iii) occasionally (iv) many times. The acts are listed below:

1) Taken things worth more than (equivalent 150 $);
2) Vandalized (buses, cars, buildings, kiosks etc.);
3) Taken a car or a motorbike for a ride without the owner's permission;
4) Been involved in a break-in or a robbery;
5) Taken part in a gang fight;
6) Used weapons in a fight (knifes, striking weapons, guns);
7) Started a fight with youths of another colour than their own;
8) Threatened someone with violence;
9) Stayed away from home more than 24 hours while the adults at home did not know where they were;
10) Purposely set fire to something (house, forest, cars etc);

11) Forced someone to act against their will;
12) Slipped into a cinema to watch a film they were not old enough to view;
13) Taken valuable things from one of their class mates;
14) Stolen from stores/ shops;
15) Witnessed serious violence outside their home.

The variable score value was constructed by adding up the number of items that the respondent had rated category three (sometimes) or more. For example, a score of three or more on five acts, gives a simultaneity of delinquent acts = 5. To avoid strong effects from single outliers, the upper limit is set at six. Thus, the simultaneity of delinquent acts will range from zero to six. This construction is indicating the act is not a randomly happening, but a behavior pattern. The more repeated acts involved the more consistent is the delinquency.

The statistics program used for the analysis was SPSS (Statistical Package of Social Science) George & Mallery, 2001. T-tests and hierarchical regression are used to test the hypothesis.

RESULTS

1. H^0: The first hypothesis stats that there are no differences between traditional and non-traditional families regarding i) financial situation at home, ii)parent-child attachment, iii)psychological adjustment, iv)parental knowledge, v)peer selection, vi) adoption of deviant norms (socializing) and delinquent behavior among adolescents. The results of these tests are tabled below.

Table 1. Summary of t-tests of differences between traditional families and alternative arrangements with regard to financial situation, attachment qualities, parental knowledge, psychological adjustment, peer selection, adoption of deviant norms (morality) and delinquent behavior.

	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference
Financial situation at home	-5.49	614	.000	-.455	.082
Attachment: Trust/authority	-3,67	631	.000	-.313	.085
Attachment: Disclosure	-2.23	631	.026	-.191	.086
Psychological symptoms	3.48	619	.001	.302	.087
Parental knowledge	-2.12	640	.034	-.181	.085
Peer selection	4.87	657	.000	.406	.083
Adoption of deviant norms	3.35	636	.001	.284	.084
Delinquent behavior (Range 0-6)	4.08	657	.000	.564	.116

As a result of the analysis, H^0 was rejected for all tested differences, and the expectations based on findings of earlier studies on this topic were supported. The standard deviations in the alternative family category were all higher than for the traditional group on all items.

Thus, the mean (M) was a better predictor of the actual outcomes in the traditional category than in the alternative category where the observations were more scattered.

2. H^0: The second 0-hypothesis assumes that parental attachment will not inflate on a the bivariate correlation between family structure and parental knowledge. The test results presented in table 1 demonstrated a significant difference in knowledge between the two family categories. (t= -2.12, p<.34). The bivariate correlation between family structure and parental knowledge was found to be r= -.083 (p< .034). To test H^0, a multiple regression equation was performed. The attachment variables together with family structure entered simultaneously the equation with parental knowledge as dependent. The analysis is presented in table 2.

Table 2. Multiple regression of the effect of family structure and the attachment variables on parental knowledge.

	Unstandardized Coefficients		**Standardized Coefficients**
	B	**Std. Error B**	**β**
Family structure (trad./alt.)	-.03	.07	-.01(ns)
Trust/authority	.43	.03	.44**
Feeling of being controlled	-.15	.03	-.15**
Disclosure	.30	.03	.30**

*< .05.**p<.01. R^2 = .42

H^0 had to be rejected because the direct impact from family structure was reduced to non-significance when parent-child attachment variables were positioned in the equation. The result supported the expectation claimed that the relation between family structure and parental knowledge was mediated by parental attachment because it was the attachment that was impacted by the structure that in turn explained parental knowledge. The alternative family will according to this theory obtain as much parental knowledge as the traditional families if the attachment is constant.

The youngster's feeling of being controlled appeared to be negative related to parental knowledge. (β= -.15, p<.001) as Kerr & Stattin (2000) asserted. At the first impression this finding might support the statement that not all tracking and surveillance seem to increase parental knowledge.

(3. H^0): Parental knowledge has often been found to be the best predictor to adolescents' peer-selection and delinquency. Parental knowledge is also claimed to predict peer-selection and delinquency at different levels for girls and boys (Jakobson & Crockett, 2000; Laird & al, 2003). These expectations are to be tested.

H^0 states that there are no statistical significant differences between boys and girls regarding the prediction strength of parental knowledge on adolescents' delinquent behavior.

The result is presented in the following table.

Table 3. Correlation between knowledge and the two outcome variables: peer selection and delinquent behavior. Separate analysis for boys and girls.

		Peer-selection	Delinquency	
Parental knowledge		**r**	**r**	**n**
In	Total sample	-.44**	-.44**	659
In	Boy sample	-.40**	-.50**	329
In	Girl sample	-.45**	-.26**	330
Significance of differences (r) between boys and girls		Z(α)= .69 (ns)	Z(α)= 3.63 p <.01	

Correlations: *< .05.**p<.01.

The correlations between parental knowledge and the two outcome variables "peer selection" and "delinquent acts" were much alike in the total sample (r= -.44). Immediately the result demonstrated differences between gender homogeneous samples. Parental knowledge predicted delinquent behavior significant better in the boy sample (r= -.50) than in the girl sample (r= -26), and the H^0 had to be rejected. The similar findings done by Jakobson & Crockett (2000) were supported. With regard to the correlation between parental knowledge and peer-selection no gender differences were found.

At the first glance it ought to be far more profitable for parents to obtain knowledge about boys' whereabouts and activities than about girls' when the intention is to reduce delinquency among adolescents. This result could be interpreted in several ways. May be girls are not likely to act delinquent even if their parents have low level of knowledge about their whereabouts, or they act delinquent in spite of their parents' knowledge. Both explanations would weaken the correlation. Probably the first interpretation should be suggested. Girls' peer-deviance was predicted by parental knowledge at the same level as for boys (r=.44).

4. H^0: According the strain theory and findings of earlier studies, family disruption may course psychological strain ("depth") and contribute to negative psychological adjustment (Agnew, 2004) where emotions like anger and disappointment may affect the behavior as much as control related variables.

Formulated for testing as H^0, the fourth hypothesis asserts that family structure does not contribute statistical significant to psychological adjustment (psychological symptoms) when controlled for gender and financial situation, attachment qualities and parental knowledge. Hierarchical regression was performed where family structure entered the model at the last step, and change statistics were executed.

Family structure demonstrated a small unique contribution to psychological adjustment at a significant level ($\Delta R^2 = .009$ for step 2, $p < .01$). Total variance explained by all the independents included in the modelled was $R^2 = .13$. Of the independents included, the best predictors of psychological adjustment (psychological symptoms) were gender (β= .28), trust/ authority (β= -.10), and parental knowledge (β= -.12). Thus, girls reported higher level of depressive symptoms than boys. In addition higher level of both parental trust and reported knowledge predicted a lower level of psychological symptoms. The unique variance contributed by family structure might support the asserting that there is "something" in the none-traditional family's situation that can not be described in social control terms, but this contribution need to be further explored.

5. H^0: The main model of this study is grounded on an expectation of that the critical link between family structure and delinquent behavior is the affiliation with deviant peers and the following socializing process into the peers' norms and values (Persson, Kerr et. Stattin, 2004). Thus, family structure was expected to contribute uniquely to the drifting towards deviant peers even after controlling for gender, financial situation, attachment variables and parental knowledge.

H^0 maintained that family structure would not make any unique contribution to the selection of peers. Hierarchical multiple regression procedure was used and change statistic executed. The result is presented in table 4.

Table 4. Summary of hierarchical regression analysis for variables predicting peer selection in two steps.

		Unstandardized Coefficients		Standardized Coefficients
Steps	**Variables**	**B**	**Std. error B**	**β**
Step 1	Gender	-.28	.07	-.15**
	Financial situation at home	-.01	.04	-.03
	Disclosure	-.24	.04	-.24**
	Trust/authority	.04	.04	.03*
	Feeling of being controlled	.04	.04	.04
	Parental knowledge	-.29	.05	-.28**
	Psychological symptoms	.14	.04	.15**
Step 2	Gender	-.28	.07	-.15*
	Financial situation at home	.01	.04	-.03
	Disclosure	-.24	.04	-24
	Trust/authority	.04	.04	.03
	Feeling of being controlled	.04	.04	.04
	Parental knowledge	-.29	.05	-.28*
	Depressive symptoms	.14	.04	.15
	Family structure (traditional/alternative)	-.27	.08	-.13**

*< .05.**p<.01. R^2 = .27 for step 1; Δ R^2 = .015 for step 2 (p< .000)

The analysis led to rejection of H^0. The direct contribution made by family structure was 1,5 % (Δ R^2 = .015 for step 2, p< .000), For families containing one or none-natural parent it was possible to predict a higher level of deviance among the adolescent's friends. Moreover, in the current model gender was a marked contributor (β= -.15). Boys were more likely to report a higher level of deviance among friends than girls. Two other variables seemed to be important, namely disclosure (β= -.24), parental knowledge (β= -.28). Low level of disclosure and knowledge tended to increase the probability of a high level of peer deviance. In addition, psychological adjustment was significant in predicting peer deviance (β=.15). In total the explained variance in peer selection was 27 %.

6. H^0: The sixth and last hypothesis (H^0) stated that family structure would not make a unique contribution to delinquent behavior. The analyse-results are presented in following table (table 5). The analysis was modelled as hierarchical multiple regression where family

structure was entered at the last step. The model ensured that the variance added by entering family structure was uniquely explained by family structure.

Table 5. Summary of hierarchical regression analysis for variables predicting delinquent behavior.

		Unstandardized Coefficients		Standardized Coefficients
Steps	**Variables**	**B**	**Std.error B**	**β**
Step 1	Gender	-.18	.09	-.06*
	Financial situation at home	.04	.04	.03
	Disclosure	-.02	.05	-.01
	Trust/authority	-.10	.05	-.07*
	Feeling of being controlled	.11	.04	.08**
	Parental knowledge	-.11	.05	-.08**
	Psychological symptoms	.07	.04	.05*
	Peer selection	.58	.05	.41**
	Adoption of deviant norms	.36	.05	.25**
Step 2	Gender	-.17	.09	-.06*
	Financial situation at home	.06	.04	.04
	Disclosure	-.02	.05	-.01
	Trust/authority	-.09	.05	-.06
	Feeling of being controlled	.11	.04	.08**
	Parental knowledge	-.12	.05	-.08*
	Psychological symptoms	.06	.04	.04
	Peer selection	.56	.05	.40**
	Adoption of deviant norms	.36	.05	.25**
	Familystructure(traditional/alternative)	-.19	.09	-.06*

*< .05.**p<.01. R^2 = .50 for step 1; Δ R^2 = .003 for step 2 (p< .035)

The change in variance from the first step to the second was statistical significant (Δ R^2 = .003 for step 2, p< .000). Thus, H^0 was rejected. Peer selection and adoption of deviant norms predicted strongly delinquent behavior. In addition the adolescent's feeling of being controlled by the adults at home and parental knowledge remained at a significant level.

Family structure was found to demonstrate a remarkable resistance against being inflated by the other variables.

To systematically detect how the relation between delinquent behavior and different variables were inflated by other variables as they enter the equation in succession a hierarchical regression model was designed. By letting all independent variables or variable categories enter the model at separate hierarchical steps, it should be possible to observe how a variable/ set of variables changed their effects on delinquent behavior at each step compared to the preceding ones, and how much variance each variable/ set of variables accounted for in addition to the previous. The result is presented in table 6.

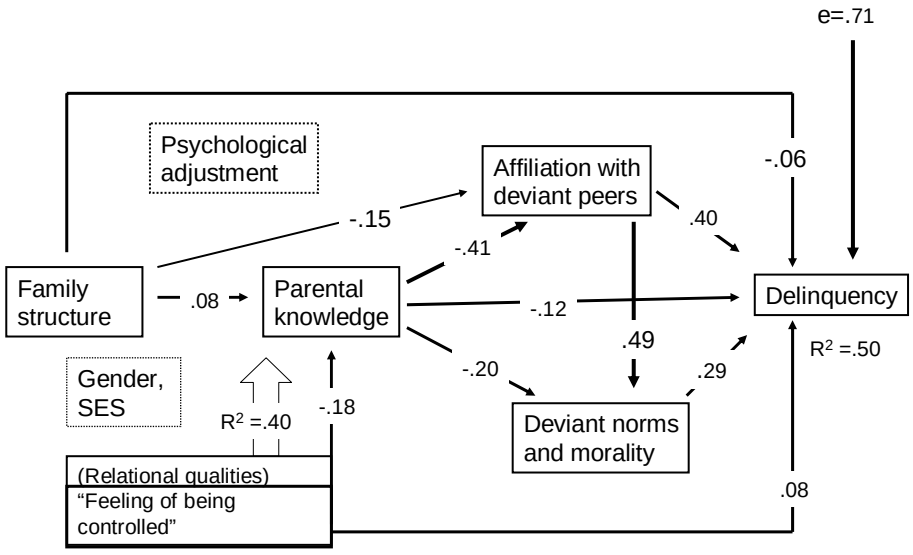
Table 6. Hierarchical regression analysis of all independents on delinquent behavior conducted in six steps according theoretical succession. Additives at the actual steps were: Step 1: Gender, financial situation and family structure, Step 2: Parent- child relationship, Step 3: Parental knowledge, Step 4: Psychological symptoms, Step 5: Peer- selection, and Step 6: Adoption of deviant norms.

	Variables	**Step 1**	**Step 2**	**Step 3**	**Step 4**	**Step 5**	**Step 6**	**Δ R^2**
Step 1	Gender	-.23**	-.20**	-.18**	-.21**	-.14**	-.06*	
	Economy	.01	.02	.03	.03	.04	.04	
	Two-parent	-.18**	-.14**	-.14**	-.13**	-.07*	-.06*	.09**
Step 2	Trust		-.19**	-.08	-.07	-.09*	-.06	
	Disclosure		-.24**	-.17**	-.16**	-.04	-.01	
	Being controlled		.22**	.09*	.09**	.07	.08	.15**
Step 3	Par. knowledge			-.26**	-.24**	-.10	-.08*	.04**
Step 4	Psych.symptms				.11**	.05	.04	.01**
Step 5	Peer-selection					.51	.40**	.19**
Step 6	Acc.dev.norms						.25**	.03**

*< .05. **p<.01. R^2 = .51, Regression coefficients are tabled in standardized coefficients (β)

The prediction strength of gender on delinquent behavior was significant and stable almost at the same level until peer selection and adoption of deviant norms entered the equation at step five. Most of the effect of gender on delinquent behavior was obviously mediated by the friendship variables. Financial situation at home showed stable none-significant link to delinquent behavior unaffected by any of other the other variables. Family structure displayed a gradual reducing of the coefficient through out the succession. Most marked changes occurred when the attachment variables entered the model at step two and when the friendship variables entered at step five and six. Parental knowledge changed the direct strength between attachment and delinquent behavior (Step 3). The relatively strong and direct impact from parental knowledge (β= -.26, was drastically transformed to be indirect when the friendship variables entered at step five. The friendship variables also affected some of the direct prediction of the psychological symptoms. The analysis above demonstrated that the effects from several variables were influenced by a few essential variables; parental knowledge and the friendships variables.

In order to reduce the number of variables and to make the presentation clear a stepwise regression analysis was run. This procedure reduced the independent list to five essential variables that best predicted delinquency; i)peer's deviance (β= .26), ii)adoption of deviant norms (β= .30), iii)parental knowledge (β= -.15), iv)the feeling of being controlled (β= -.08) and at last family structure (β= -.08). Together these five variables accounted for the same variance as the full model (R^2 = .50). These five variables constituted the path analysis below (fig. 2)



Notes: Only significant coefficients are tabled. Gender, financial situation at home and psychological symptoms were completely mediated by other variables, and so were trust and disclosure (Relational qualities 1 and 2). Only the third quality "the feeling of being controlled" contributed directly to delinquent behaviour. Forty percent of parental knowledge's was explained by relational qualities (symbolized by broad arrow)

Figure 2. Paths between variables that contributed directly to delinquency.

It is evident that parental knowledge is mainly a mediating variable for parental attachment. The feeling of being controlled remained significant in the stepwise procedure and related negatively to parental knowledge, but positively and directly to delinquent behavior. The two internal family variables, family structure (β= -.15) and the knowledge (β= -.41), were marked contributors to peer selection. Two-parent families, low feeling of being controlled and high level of parental knowledge decreased the probability of low level of peer deviance. The internal family variables (family structure, feeling of being controlled and parental knowledge) mainly predicted the friendship variables (affiliation and socializing). Peer selection and norm-adoption are prominent predictors to delinquent behavior, respectively (β= .40 and .29). Higher levels of peer deviance and adopting of deviant norms were predictors for higher levels of delinquency. As this analysis was modelled, much of the impact of peer deviance on delinquency seemed to be mediated by norm adoption (β=.49).

In total the model explained 50 % of the variance in delinquency and demonstrated high explanation power within this issue.

An ad hoc analysis was performed to scan how other family arrangements inflated on delinquency. Besides the main dichotomy, traditional– versus alternative families, other family structural dichotomies were available in the data, such as step-parents, mother or father custody and living with non-of the natural parents. These alternatives are of cause only present in the "alternative families" category. Thus, the two-parent families will be excluded from the ad hoc analysis that was modelled as an ANCOVA where also gender entered as one of the factors to look for interactions. These family structural components were not included in the main analysis partly because of small groups, but mainly because of the research question and the mathematical trouble this would have caused as distinct groups limited to

one value (0) of the main family structure component when multiple regression was used. The analysis demonstrated that none of the sub groups within the alternative family arrangement variants predicted delinquency when all the other variables from the main analysis were positioned as covariates. The impact of family structure seemed mainly to be explained by the some advantages in the presence of two natural parents or disadvantages in the absence of one or both.

DISCUSSION

The analysis confirmed earlier claims regarding differences in delinquent behavior between adolescents living in traditional families and in alternative family arrangements (Chen & Kaplan, 1997; Kierkus & Baer, 2002, Kierkus & Baer, 2003). Thus, the current study has contributed to the consensus about this issue in relation to a Scandinavian sample. The impact of family structure on delinquent behavior remained significant, providing a unique predictor of delinquent behavior even after being controlled for all the other variables in the model (tab.5). Neither parental attachment nor the friendship variables fully eliminated a direct correlation between family structure and delinquent behavior, as some researchers have suggested (Sampson and Laub, 1994; Adlaf and Ivis, 1997) and Sokol-Katz & al.1997). In fact, the findings supported the claims of Chen & Kaplan (1997), who found a direct relationship between family structure and a range of risk behaviors. Although the relation between family structure and delinquent behavior was relatively persistent throughout the analysis, two variable categories that seemed to inflate at any extent, were the attachment variables and the friendship variables (tab.6). These observations suggest two traditional intervention methods: i) improving the relational qualities at home, and ii) increasing the supervision of peer-selection.

The findings might support the suggestion that some of the impact of family structure on deviance and delinquent behavior is related to the strains and conflicts before, during and after the parental break-up (Barber & Eccles, 1992; Amato & al., 1995). In a series of longitudinal studies Cherlin & al. (1991) demonstrated that children were observed to engage in deviant behavior before the parental break-up actually occurred. This may serve to decrease the attachment and the parental access to control (Dishion et. McMahon, 1998). Ongoing conflicts at home may disturb children's emotional stability, finding expression in aggression and delinquent behavior. There is also a possibility that the child's behavior may contribute to such conflicts and family disruption (Flewelling et Bauman, 1990). Some children start their antisocial behavior in early childhood (Moffitt et. Caspi, 2001) and their behavior may be a heavy burden to their parents. Thus, it may prove unproductive to focus on the parents' controlling ability in isolation.

Differences between traditional and non-traditional families were also found regarding three other essential variables: psychological symptoms, peer selection and adoption of deviant norms. The differences revealed in psychological symptoms were similar to those found in earlier studies in Scandinavian (Hansagi, Brandt and Andreasson, 2000; Weitoft, Hjern, Haglund & Rosén, 2003), Finland (Mäkikyrö, Sauvola, & Moring, 1998; Sauvola, Räsänen, Joukamaa, Jokelainen, Järvelin & Isohanni, 2001), and Norway (Breidablikk & Meland, 1999; Naevdal & Thuen, 2004).

Family structure was uniquely related to psychological symptoms ($\Delta R^2 = .011$), even after being controlled for gender, financial situation, attachment qualities and parental knowledge. A range of conditions - for example, conflicts, grief, insecurity, attachment qualities - might inflate psychological adjustment. Psychological adjustments such as aggression and depression may result in school failure and rejection by usual peers (Laird, Pettit, Dodge & Bates, 2005), which may in turn lead to affiliation with deviant peers. (Persson, Kerr & Stattin, 2004)

Family structure demonstrated the expected differences in peer selection (Dishion, Capaldi, Spracklen & Li , 1995), and in the adoption of deviant peer's norms. So far, therefore, the study confirmed a long tradition on this issue; family structure was weakly related to the parent-child relationship and parent's knowledge about the adolescent's friends and activities (Dishion, Capaldi, Spracklen & Li , 1995). The structure's direct impact on parental knowledge disappeared, when controlled for attachment qualities. Knowledge was clearly explained by the three attachment qualities: disclosure and trust/authority (Sampson & Laub, 1994; Adlaf & Ivis, 1997; Kierkus & Baer, 2002); and the feeling of being controlled, was negatively related to knowledge, in accordance with Sattin and Kerr's (2000) study, in which children's unsolicited disclosure and parents' direct attempts at soliciting information were independently correlated with amount of parental knowledge. The effect of family structure on knowledge was strongly mediated by the parent-child relationship, and these findings seemed to support the control theory's hypothesis regarding the attachment's role in parental efficacy; knowledge appeared to be an important defence against destructive friendships and delinquency. Waizenhofer & Buchanan (2004) concluded that "…*knowledge itself, and - maternal knowledge at that - was the only predictor of adolescent deviance*." (p. 357). They also found that the method of obtaining knowledge alone could not predict adolescent adjustment.

The assertion that a lower level of monitoring (i.e. knowledge) increased the risk of affiliation with deviant friends (Dishion, Capaldi, Spracklen & Li , 1995) was verified in the current study. Family structure was directly related to peer-selection, even after controlling for basic variables (gender and financial situation at home), attachment, knowledge and psychological symptoms; a portion of unique variance still remained ($\Delta R^2 = .015$) that was larger than the effect of family structure on delinquency ($\Delta R^2 = .003$). Thus, family structure explained peer-selection better than it explained delinquency.

The correlation between gender and delinquent behavior was relatively strong and did not weaken before the friendship variables entered the equation. Finance, family structure, parental attachment, parental knowledge and psychological symptoms did not affect the relationship between gender and delinquent behavior very much. Gender's impact on delinquency was therefore judged to be strongly influenced by peer-selection and the adoption of deviant norms (tab. 6). The analysis also indicated that boys selected deviant friends and adopted deviant norms more frequently than girls. (Crick & Grotpeter, 1995). Nevertheless, friendship variables mediated gender's impact on delinquency and demonstrated gender's indirect impact on delinquency. These findings might also indicate that girls and boys' deviant friendships differ in kind, and that the fellowship and norms shared by these groups of boys may explain the gender differences in prevalence of delinquency (Maccoby & Jacklin, 1980; Nævdal, 2005). The correlation between parental knowledge and delinquent behavior was stronger in this group than in the girls' group (Jakobson & Crockett, 2000; Laird & al, 2003). The parental knowledge was a better predictor for boys' behavior.

Perhaps most girls do not join in delinquent activities, even though their parents' have little knowledge of their whereabouts and friends. Girls' delinquent bheavior is probably not well measured by the actual assessment. Girls' traditional deviance may be more related to sex and drugs that to break ins and car stealing, but gender traditions are rapidly changing.

As expected, girls reported a higher level of psychological symptoms (internalizing) and they were more likely to inform their parents, which confirms Waizenhofer & Buchanan's findings (2004) when they investigated parental methods used in obtaining knowledge. They also found that Boys tended to report a slightly better family financial situation at home than girls. A higher level of financial security was predictive of a lower level of psychological symptoms and a higher level of attachment and parental knowledge. In isolation these relationships supported the suggestions that economical hardship produces strain and reduces the quality of relations within the family (DeMaris & Geofferey, 1992; McLanahan & Sandefur, 1994). However, there was no significant correlation between financial situation at home and external variables like friendship or delinquency. Gender differences in evaluating the family's financial situation may be partially explained by variations in the potential consumption patterns of boys and girls. A preliminary analysis of current data resulted in no interaction between gender and experienced financial situation at home on delinquency (Cooksone, 1999).

The final overview presented in figure 2 includes a set of variables that proved significance in predicting delinquency after a stepwise exclusion of the others.

The variance in delinquent behavior explained by this optimal set of variables was as great as that explained by the full model. Family structure had both a direct and an indirect effect on delinquency, with both parental knowledge and peer-selection mediating the effect of family structure on delinquent behavior. In traditional families, parents were more likely to obtain knowledge from their child and less likely to have a teenager that was involved with deviant peers. The attachment qualities were excluded during the stepwise analysis because these were fully mediated by parental knowledge. The feeling of being controlled appeared to be directly related to delinquent behavior and predicted knowledge at a significant level, but in negative direction compared to the other relational qualities (trust and disclosure), which is in accordance with Kerr & Stattin's (2000) findings. This observation is perhaps linked to the adolescent's attempts to hide information, to the worry this causes the parents and to the fact that the latter's attempts to obtain information are experienced as surveillance and control (Dishion et. McMahon, 1998).

Knowledge was strongly related to both peer-selection and adoption of deviant norms. Furthermore, knowledge appears to have a direct affect on delinquent behavior (β= -.12). A lower level of knowledge served to predict a higher level of delinquent activity. Internal family variables (structural and relational) had moderate direct effects on delinquent behavior. Most of these variables were mediated by parental knowledge; such knowledge is not simply a matter of "knowing the facts", but might rather be seen as a key indicator of functional parenting since it appeared to a substituting indicator of the parent-child relational qualities.

The friendship variables were clearly explained by internal family variables, and delinquent behavior seemed to be closely linked to friendship. Thus, the main hypothesis was supported by the findings: it seems possible to trace the adolescent's career as delinquents from family structure and parenting qualities, through deviant friendship and peer socializing, into delinquent activities.

Current study has several important limitations. Firstly it was small sample and not nation representative. Secondly, interesting data were missing, to example; i) time since family disruption, siblings and order among siblings, full SES-indicator, parents' education and so on. Results from cross sectional studies will always be hard to interpret, but as a comparative study the questions were answered, although limited.

In spite of design and data limitations and differences between cultures and society structures, the observations in world wide studies related to this issue were remarkable similar.

From actual clinical situations I have never or seldom seen a child or an adolescent that have been unaffected by their parents' separation. Although they happened to overcome as the time was passing, the event appeared to be a "big bang" in their life. Their developing stability was disturbed, and constituted a critical phase that made interacting with important others difficult, not only the parents, but also teachers and ordinary peers were often complaining. This critical phase should be further investigated by longitudinal and statistical methods to search for factors that gravitate back to - or ideally keep the child on the constructive developing line. Deviant peers did obviously not.

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Chapter 3

EMPIRICAL EVIDENCE OF GROUP THERAPY ADDRESSING SOCIAL PERCEPTION IN SCHIZOPHRENIA

Daniel R. Mueller [*] ***and Volker Roder***
University of Psychiatric Services, University of Psychiatry
Bern, Switzerland

ABSTRACT

During the past few years, a number of integrated models have tried to explain the association between deficits in (neuro) cognitive domains and functional outcome (social and community functioning) in schizophrenia. Social cognition and therefore also social perception are considered to be possible mediating factors between neurocognition and functional outcome. Consequently, the direct intervention to reduce social perception deficits might be successful to improve neurocognitive and social functioning within integrated treatment of schizophrenia. One of the first comprehensive group therapy programs targeting deficits in all described functional areas is the Integrated Psychological Therapy (IPT). IPT consists of five subprograms: the first subprogram focuses directly on neurocognition, the second one addresses social perception, and the last three subprograms target social competence and problem solving.

The aim of this meta-analytic study was to examine a) the effectiveness of broad-based integrated group therapy in all of its specific intervention topics, b) the possible additional effects of social perception therapy combined with neurocognitive remediation, and c) whether improved social perception is associated with improvements in neurocognitive and social functioning. For this purpose 23 independent IPT studies including neurocognition and social perception subprograms of IPT were selected and quantitatively reviewed.

[*] University Psychiatric Services, University Hospital of Psychiatry Bern, Bolligenstrasse 111, 3000 Bern 60, Switzerland, Fax: ++41-31-930-99-88, E-mail: daniel.mueller@spk.unibe.ch

Each of the neurocognition and social perception subprograms of IPT show significant improvements in the specific intervention areas after treatment compared to baseline. But the most salient results indicate favorable effects in social perception and neurocognition when both subprograms are combined. Institutional conditions do not influence these effects. Nevertheless, both treatment conditions obtain superior effects compared to control groups. Moreover, improvements in social perception during group therapy are significantly associated with improvements in neurocognitive and social functioning.

In summary, this study corroborates the evidence of successful treatment of social perception in schizophrenia patients. The results indicate that improved social perception contributes independent variance to treatment effects in functional outcome. Consequently, and in accordance with integrated and consensus oriented models, cognitive therapy of schizophrenia patients should especially consider social perception and other social cognitive areas to optimize neurocognitive rehabilitation. Against this background our group is just carring out an international multi-center study on the new therapy approach called Integrated Neuocognitive Therapy (INT). This newly developed approach is based on psychological interventions addressed to neurocognitive and social cognitive domains, which were recently defined by the NIMH initiative for Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS), and on IPT technology.

Keywords: Schizophrenia, social perception, cognitive behavior therapy, group therapy, neurocognition, meta-analysis

INTRODUCTION

The treatment of schizophrenia patients in psychiatric care underwent some important advances during the past three decades. On the background of 1) a paradigm shift in the locus of treatment from the hospital to the community (Becker et al., 2002; Becker & Vasquez-Barquero, 2001), including the development of the Assertive Community Treatment model for ensuring continuity of care for severely ill and difficult to engage patients (Marshall & Lockwood, 1998), 2) the focus on work as a rehabilitation goal (Lehman & Steinwachs, 2003), and 3) the development of atypical neuroleptics with a more benign side effect profile (Davis et al., 2003; Hori et al., 2006), which was recently discussed as controversial (Lieberman et al., 2005), there is an improved understanding of the role of neurocognitive deficits as mediators of functional and community outcomes. Originally, on the basis of diathesis-stress models (Nuechterlein & Dawson, 1984; Zubin & Spring, 1977) the research on neurocognition was concentrated on the interaction of basic information processing deficits with stressful life events and lower vulnerability in schizophrenia. From a rehabilitative point of view, the impairments in social functioning were stated to be among the hallmarks of schizophrenia (DSM-IV, American Psychiatric Association, 1994) and accordingly, social and community integration to be one of the main objectives in schizophrenia rehabilitation (Mueller & Roder, 2005, 2007; Roder et al. 2001, 2002b, 2006c). But there was found only modest empirical evidence of the direct association of basic

neurocognitive domains with social functioning: in several studies, neurocognition contributed less than 25% to the variance of social functioning (Corrigan & Toomey, 1995; Ihnen et al., 1998; Mueser et al., 1996; summary in: Penn et al., 1996;). One possible explanation of these findings could be that most neurocognitve processes represent fairly molecular stages of information processing (e.g. visual feature detection, attention, span of apprehension) and it is not obvious how such deficits could produce the more molar expressions of schizophrenia (problem solving, judgement and social behavior impairments) (Penn et al., 1996). Consequently, a better understanding of the relationships and processes between neurocognitive deficits, symptomatology and functional outcome in schizophrenia was necessary.

Integrated models were constructed to describe the relationship of neurocognitive and social cognitive domains with positive and negative symptoms as well as with functional outcome (Brenner et al., 1992; Green & Nuechterlein, 1999). Accordingly, a growing body of empirical studies examined these assumptions (cf. Liddle, 2000; McGurk & Mueser, 2004, Milev et al., 2005; Prouteau et al., 2005; Revheim & Medalia, 2004; Revheim et al., 2006; Semkovska et al., 2004; Velligan et al., 2000; Ventura et al., 2004). Finally, a consensus-oriented initiative for the Measurement and Treatment Research to Improve Cognition in Schizophrenia (NIMH MATRICS, Green & Nuechterlein, 2004; Green et al., 2004; Gold et al., 2004; Kern et al., 2004; Marder & Fenton, 2004; Nuechterlein et al., 2004) was established to identify and define relevant separable neurocognitive domains such as attention, speed of processing, working memory, verbal learning, visual learning and memory (Nuechterlein et al., 2004).

Additionally, the paradigm of social cognition led to the hypothesis that social cognition contributes to variance beyond neurocognition to social functioning in schizophrenia. Because of the paucity of empirically based knowledge, nowadays a growing interest is addressed to social cognition (Corrigan & Penn, 2002; Green et al., 2004; Penn et al., 1997; Pinkham et al., 2003). Different definitions of social cognition are quoted in the literature: social cognition processes are how we draw inferences about other people's beliefs and intentions and how we weigh social situational factors in making these inferences, or in other words, social cognition is people's thinking about people (Green et al., 2005). More pronounced differentiation from "nonsocial" basic neurocognitions is given by the definition of social cognition as the cognitive processes involving how people's thinking about themselves, other people, social situations, and interactions (Penn et al., 1997). In general, social cognitions are separated from neurocognitions in describing them as "hot" cognitions that are influenced by affect and arousal embedded in a social context whereas neurocognitions are thought to be "cold" cognitions independent of affect and arousal (Penn et al., 1996). Several subcategories of social cognition are defined in recent schizophrenia research (Corrigan & Penn, 2002; Green et al., 2005; Pinkham et al., 2003): a) social perception (the ability to judge social rules, roles and context), b) Theory of Mind (the ability to represent the mental state of others and to make inference about their intentions), c) emotional processing (perceiving and using emotions), d) social schema (awareness of roles, rules and goals characterizing social situations and guiding social interactions), and finally, e) attributional style (how patients explain causes of their positive and negative symptoms). First studies have demonstrated that social cognition might be a mediating factor between neurocognitions and functional or vocational outcome (cf. Addington et al., 2006; Brekke et al., 2005; Bruene, 2005; Nelson et al., 2007; Pinkham & Penn, 2006; Sergi et al., 2006, 2007;

Vauth et al., 2004). Other studies support the evidence of a relationship between social cognition and psychopathological categories (Nelson et al., 2007; Peer et al., 2004; Shean et al., 2005; Subotnik et al., 2006).

The number of journal articles published during the past 20 years can best describe the increased research interest in social cognition. For that purpose an electronic search in MEDLINE from 1986 to May 2006 was undertaken; key words were “schizophrenia” and “social cognition” or “social perception” or “Theory of Mind” or “emotional processing” or “social schema” or “attribution”. Additionally, a second search was performed using only the keywords “schizophrenia” and “social perception”. Only journal articles were selected and are presented in Figure 1.

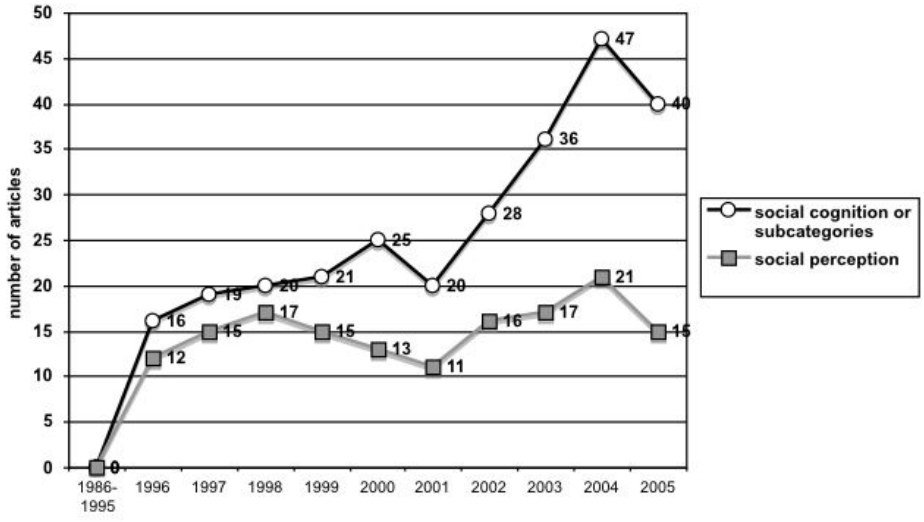

Figure 1. Number of articles addressing social cognition published in the past 20 years.

The search showed 293 articles. 157 of the articles (53.6%) concerned social perception. No articles about social cognition or its subcategories were published between 1986 and 1995. After the first theoretical integrated models included social cognition as possible functional area in the explanation of schizophrenia, research interest on focusing social cognitive aspects immediately increased in 1996. Of course, the history of social cognitive constructs could be dated much earlier using other terms. But it seems to be questionable whether the work on size estimation tasks, perception of stressful pictures, social concepts and reasoning tasks of the 50th to the 80th of the last century represent true tests of the role of social cognition (Penn et al., 1996). At least the implementation of the concepts and terms of social cognition, as it was described above, started in 1996. Up to 1999 research in social cognition was predominately done on social perception. With the change of the century, a growing research activity on other subcategories of social cognition was leading to an improved number of publications with its peak in 2004. During the first four months of 2006, 23 articles on social cognition, including 7 articles on social perception, have already been

published. Consequently, the strong research interest in social cognition in general as well as in social perception in particular, is still going on.

Social Perception in Schizophrenia

Research on social perception in schizophrenia can be summarized into investigations on deficits in social cue perception and in affect recognition (Pinkham et al., 2003). Thereby, social perception is separated from emotion perception: in contrast to emotion perception that defines the qualities of facial expression inferring someone's mood, social perception addresses social and interpersonal cues inferring situational events (Green et al., 2005). Several studies referring to molecular (focusing on components of social stimuli) and molar information processing models (focusing on scripts and schemas that define social situations) helped to identify deficits in social cue perception of people with schizophrenia (Leonhard & Corrigan, 2001): Schizophrenia patients have greater difficulties in perceiving socially relevant stimuli and in utilizing contextual information during information processing (e.g., Mandal et al., 1998; Mueser et al., 1997; Penn et al., 2002). These difficulties are even more pronounced when patients are presented with abstract stimuli compared to concrete ones (Corrigan & Nelson, 1998). Furthermore, social perception of these situational stimuli is influenced by its emotional arousal. Better social perception was observed in situations that were more emotionally charged as long as situational arousing did not overwhelm the person. In accordance with the deficits in perceiving abstract stimuli, persons with schizophrenia are less able to recognize abstract interpersonal and situational features that describe the situation such as goals, roles, rules and actions (Leonhard & Corrigan, 2001). The recognition of these features increases if peoples' own experience is familiar with the characteristics of the situation (Corrigan et al., 1996). Furthermore, social perception deficits are associated with positive symptoms (Nelson et al., 2007).

Studies concerning facial affect perception have demonstrated general deficits of people with schizophrenia compared with non-clinical controls as well as with other psychiatric disorders such as depression. But these results are inconsistent when schizophrenia is compared to other disorders with psychotic features, such as bipolar disorders (Penn et al., 2000; 2001; Pinkham et al., 2003). Deficits of people with schizophrenia in facial-affect perception tend to be higher for negative compared to positive or neutral facial displays, with the strongest impairments for the perception of fear (Edwards et al., 2002b). The deficits seem to be stable in longitudinal designs (Addington et al., 1998) although older studies give some evidence that schizophrenia patients in remission have less deficits in facial-affect perception than patients in an acute phase of the disorder (Cutting, 1981; Gessler et al., 1989). Controversial results of studies exist to a possible advantage of patients with paranoid schizophrenia compared with other subtypes (Lewis & Carver, 1995; Mandal & Rai, 1987; Nelson et al., 2007).

During the past 15 years new measurement tasks were developed to involve more realistic stimuli of interpersonal or social situations using more complex pictures, videotapes or audition tapes (e.g., Bell et al., 1997, Bellack et al., 1996). Consequently, social and emotional perception was no longer limited to simple and static facial-affective displays and it was possible to assess general social perception using complex and/or dynamic stimuli. These tasks have a better ecological validity because they give a better approximation of the

nature of affect expressed in real life situations and interactions (Penn et al., 2001). Few studies including these tasks to assess general social perception lead to similar results as was described above: people with schizophrenia have deficits in the perception of complex or dynamic social stimuli. These deficits are more pronounced when people with schizophrenia have to identify abstract cues such as the goal of a situation (Corrigan, 1997) or the meaning underlying a situation (DeBonis et al., 1997) compared with concrete cues such as what someone is wearing.

Therapy Approaches Addressing Social Perception in Schizophrenia

A further advance in psychiatric care during the past decades was the development of cognitive behavioral therapy approaches (CBT) that meet exactly the specific needs of schizophrenia patients (Mueller & Roder, 2005, 2007; Roder et al., 2001, 2002b, 2006b,c). A growing body of evidence could demonstrate the efficacy of specifically targeted, standardized, cognitive-behavioral interventions (Gould et al., 2001; Krabbendam & Aleman, 2003a; Kurtz et al., 2001; Mojtabai et al., 1998; Mueller et al., 2007; Pfammatter et al., 2007; Pilling et al., 2002a,b; Pitschel-Walz et al., 2001; Rector & Beck, 2001; Roder et al., 2006a; Zimmermann et al., 2005). Additionally, first studies have proved that CBT tends to be cost-effective (e.g., Andrews et al., 2003; Vos et al., 2005). CBT approaches can be divided into four main groups based on their respective objectives (Pilling et al., 2002a,b; Roder et al., 2001, 2002a,b): 1) family therapy, 2) social skills and problem-solving therapy, 3) neurocognitive remediation, and 4) CBT to reduce persistent positive symptoms. These four CBT treatment approaches share some limitations: a) the preponderance of research on specifically targeted interventions focusing on a single treatment approach, and b) only indirect interventions on social cognitive functioning.

Unfortunately, not all schizophrenia patients benefit from CBT as well as from other therapies. Meta-analyses including CBT studies by calculating effect sizes (ES) obtain mainly medium effects. Medium effect sizes (ES=0.5) are defined as an improvement of half a standard deviation of the included population (Cohen, 1988). The transformation of ES=0.5 into a Binomial Effect Size Display (BESD), as suggested by Rosenthal (1994), leads to the correlation coefficient of r=0.24, that means that an average of 62% of CBT patients benefited from their treatment and 38% did not.

Against this background the question arises how social cognitive functioning could still be improved under aspects of differential indication. Up to now few approaches that include specifically targeted interventions to improve directly social cognition and social perception in particular have been developed. Most of them put the focus on emotion perception, whereby the primary therapy goal is to improve emotion perception and management that support patients' coping with maladaptive and negative emotional experience in daily life situations (Emotional Management Therapy [EMT] by Hodel et al., 2004; Training of Emotional Intelligence [TEI] by Vauth et al., 2001; computerized Emotion Training program by Silver et al., 2004; Training of Affect Recognition [TAR] by Frommann et al., 2003; Woelwer et al., 2005; Training of social and emotion Perception by van der Gaag et al., 2002). Two further developments of broad focus social cognition therapy are the Social Cognition and Interaction Training (SCIT by Penn et al., 2005,2007; Combs et al., 2007) and the Metacognitive Skill Training (MCT by Moritz et al., 2007), which both include besides

emotion perception other key domains in social cognition. But up to now, MCT is not evaluated and the SCIT evaluation study is not finished yet (Penn et al., 2005; Combs et al., 2007).

In contrast to the more specifically targeted interventions, two broad-based comprehensive and systematic approaches have been developed and successfully evaluated. The Cognitive Enhancement Therapy for schizophrenia (CET, Hogarty et al., 2004) is a multidimensional approach that integrates individual computer-assigned training in neurocognition with social cognitive group exercises used commonly in social skills trainings. Although CET includes exercises with a broad scope in social cognition, there are no interventions exclusively addressed to social perception. The primary focus of CET is on neurocognitive and social cognitive processes, where the authors point to a theoretical influence of the Integrated Psychological Therapy program for schizophrenia patients (IPT, Brenner et al., 1994; Mueller et al., 2007; Roder et al., 1988, 2002a, 2006a) on CET. IPT includes explicitly a subprogram on general social perception. This paper explicates the IPT model, and summarizes research conducted on it over the past 26 years especially on social perception therapy.

Integrated Psychological Therapy (IPT)

IPT is a group-based cognitive behavior therapy program for schizophrenia. In contrast to most other cognitive-behavioral therapy approaches IPT combines and integrates neurocognitive and social cognitive remediation with psychosocial rehabilitation. IPT is based on the underlying assumption that basic deficits in neurocognitive functioning have a pervasive effect on higher levels of behavioral organization, including social skills and social and independent functioning (Brenner et al., 1992). Based on this, successful psychosocial rehabilitation requires remediation of both underlying neurocognitive impairments and related social cognitive deficits, as well as building social, self-care, and vocational skills. IPT strives to integrate neurocognitive with psychosocial rehabilitation in a systematic, manualized fashion. IPT is organized into five subprograms (Figure 2). As the later subprograms build on the earlier ones, they are taught sequentially, beginning with neurocognition and social cognition, followed by communication skills, social skills, and finally problem solving skills. The first subprogram primarily targets basic impairments in neurocognition (e.g., attention, verbal memory, cognitive flexibility, concept formation). Remediation of neurocognitive deficits in IPT differs from conventional computer-based training approaches that emphasize repetitive training (rehearsal learning) of so-called "cold" cognitions. Specific interactive exercises are practiced through engaging patients in group exercises, where they learn alternative strategies for achieving individual goals (“strategy learning”, Krabbendam & Aleman, 2003a). The second subprogram addresses deficits in social cognition (e.g., social and emotional perception, emotional expression) within the group context. The fourth and fifth subprograms focus on building patients’ social competence through practice of interpersonal skills (e.g., role-plays) and group-based problem-solving exercises. The third subprogram serves as a bridge between the first two and last two subprograms by focusing on neurocognitive and social cognitive skills that have a direct impact on interpersonal communication, such as verbal fluency, verbal and emotional expression, and executive functioning. The specific targeted goals for each individual subprogram depend on each

patient's deficits and strengths, and the functional outcomes that are the focus of treatment (for details see Brenner et al, 1994; Roder et al., 2002a). Therefore, the schematic sequence as displayed in Figure 2 is not viewed as conclusive. The basic treatment format in all five IPT subprograms is group therapy. Groups usually comprise five to eight participants guided by one well-trained therapist and one co-therapist. Additionally, in vivo exercises and homework assignments as well as individualized sessions by request of patients or therapists are implemented too. Because IPT was one of the first systematic, comprehensive, and manualized treatment approaches for schizophrenia, it has been widely adopted, especially in Europe, but also in North-America and Asia. In the meantime, the German edition of the IPT manual is in its fifth edition available (Roder et al., 2002a) and has been translated into 10 languages.

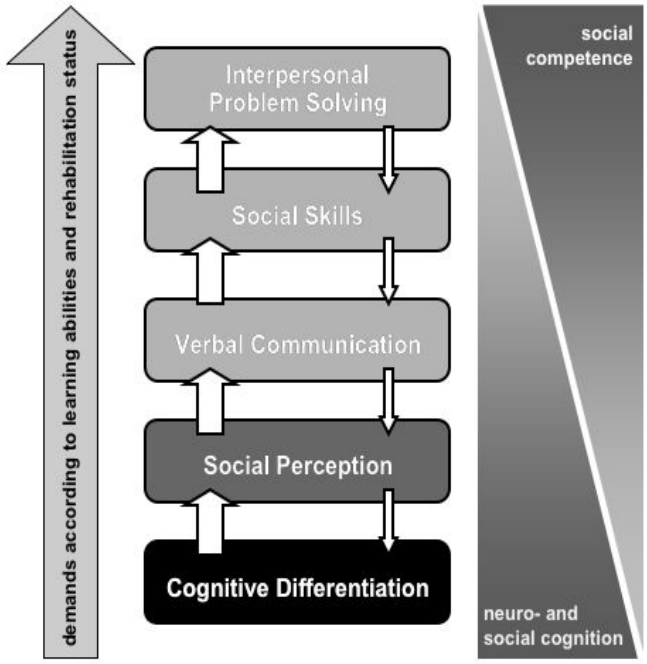

Figure 2. Integrated Psychological Therapy (IPT).

METHODS

Over the past 26 years, research groups in seven countries have conducted 23 studies investigating IPT including at least the neurocognitive subprogram ("Cognitive Differentiation") or the social cognitive subprogram ("Social Perception") or both of them, with a total sample of 1,033 patients with schizophrenia (diagnosed according to ICD or DSM). All study investigators were in contact with the IPT research group in Bern, Switzerland, which supervised some of them during treatment procedure. Sample size, patient characteristics, state of illness, design, setting and site conditions were extracted

independently by both of us each, and differences were resolved by consensus after review. In 19 studies under review, IPT was compared with standard care (pharmacotherapy and social therapy) and/or with a placebo-attention condition (non-specific group activity). In one study, IPT subprograms were compared with each other. Three studies had no control group. These studies are summarized in Table 1.

Table 1. 23 independent IPT studies (N=1033)

	Source	COUNTRY	N	SETTING	CENTER
1)	Brenner et al. 1980, 1987	Germany	43	inpatient	academic
2)	Stramke and Hodel 1983	Switzerland	18	inpatient	academic
3)	Brenner et al. 1987	Germany	18	outpatient	non-academic
4)	Hermanutz and Gestrich 1987	Germany	64	inpatient	non-academic
5)	Kraemer et al. 1987	Germany	30	inpatient	mix
6)	Roder et al. 1987	Switzerland	17	inpatient	non-academic
7)	Funke et al. 1989	Germany	24	inpatient	non-academic
8)	Heim et al. 1989	Germany	65	inpatient	non-academic
9)	Peter et al. 1989, 1992	Germany	83	inpatient	academic
10)	Kraemer et al. 1990	Germany	43	inpatient	academic
11)	Olbrich and Mussgay 1990	Germany	30	inpatient	academic
12)	Roder 1990	Switzerland	18	inpatient	non-academic
13)	Schüttler et al. 1990, Blumenthal et al. 1993	Germany	95	inpatient	non-academic
14)	Van der Gaag 1992	The Netherlands	42	inpatient	non-academic
15)	Theilemann 1993	Germany	45	inpatient	non-academic
16)	Hodel 1994	Switzerland	21	inpatient	academic
17)	Hodel & Brenner 1996	Switzerland	15	inpatient	academic
18)	Spaulding et al. 1999	USA	91	inpatient	academic
19)	Vallina et al. 2001	Spain	35	outpatient	non-academic
20)	Vita et al. 2002	Italy	86	outpatient	non-academic
21)	Penadés et al. 2003	Spain	37	outpatient	academic
22)	García et al. 2003	Spain	23	outpatient	non-academic
23)	Briand et al. 2005, 2006	Canada	90	outpatient	mix

IPT has been provided to patients in a variety of different settings and locations (e.g., inpatient and outpatient settings in academic and non-academic institutions). The characteristics of these studies vary in terms of sample size and design; in 20 studies (87%) a controlled design was used, while in 13 of these studies (65%) patients were randomized to IPT or control conditions. The heterogeneity of the scientific quality of studies on IPT can be attributed to changing therapy settings and designs over the 26-year period during which the research was conducted. For example, earlier studies tended to have smaller sample sizes and provided a higher frequency of therapy sessions in predominantly inpatient settings (Spearman's correlation, one-tailed: $r>.35$, $P<.05$, K-studies$\geq$22).

We conducted a meta-analysis in order to evaluate the effectiveness of IPT when applied under varying clinical conditions. Of special interest are: 1) the global therapy effect (defined as the mean of all assessed outcome variables) during therapy; 2) symptom dimensions and functional impairments, including a) neurocognition (attention, memory, executive functioning), b) social cognition (social perception, emotional processing, social schema), c) exclusively social perception, d) psychopathology (negative and positive symptoms), e)

psychosocial functioning (social and role functioning, self-care, occupational skills), and f) assessment formats; and 3) moderators of treatment response, including patient characteristics (e.g., gender), setting (e.g., inpatient/outpatient), design (e.g., patient allocation to treatment condition), and site conditions (e.g., academic and non-academic sites).

On the background of integrative model assumptions understanding neurocognition not as linear but as systemic wherein information processing is passed in complex reciprocity up, down and across the functional levels of neurocognition, social cognition, motor responding and social behavior (Brenner et al., 1992; Spaulding & Poland, 2001), up to now there is no evidence that combined intervention in neurocognition and social cognition conduct to better outcome in both intervention topics. Consequently, we evaluated in a second step a) if assessments before and after specific therapy offering schizophrenia patients the neurocognitive or social cognitive IPT subprograms obtain improvements in the specific intervention topics, b) if schizophrenia patients receive additional benefits from neurocognitive therapy when combined with social perception treatment in comparison to neurocognitive therapy alone, and c) if improved social perception is associated with improvements in nerocognitive and social functioning.

Data Analysis

To include all studies and to determine the extent of change in patients under IPT as well as under control conditions, effect sizes (ES) within the comparison groups were calculated: $ES=(M_{pre}-M_{post\ or\ follow\text{-}up})/SD_{pre\ of\ pooled\ groups}$ (Smith & Glass, 1977). ES can generally be categorized as small (0.2), medium (0.5), or large (0.8) (Cohen, 1988). The possible influence of unequal sample sizes and standard errors between the studies was statistically controlled by using a fixed effects model in which the ES of each study was weighted by its inverse variance (Shadish & Haddock, 1994). The homogeneity of variance of the ES of the individual studies was tested by calculating Hedges's Q_W (Hedges, 1994). To measure the significance of the weighted ES, the confidence interval and *z*-transformation of the ES were used (Shadish & Haddock, 1994). Differences between groups were evaluated by calculating Hedges's Q_B (Hedges, 1994). Finally, non-parametric Spearman's correlation coefficients were calculated to control the relationship of outcome with possible moderator variables.

RESULTS

The patient characteristics of the entire sample comprising 1,033 adult patients in 23 studies are displayed in Table 2. In general, two thirds of the participants were male, almost 35 years old, and had an average IQ. As a result of the different phases of patients' rehabilitation in each study, the duration of illness and hospitalization is heterogeneous. All studies provided pharmacological treatment for patients. The daily dosage of antipsychotic medication was transformed into chlorpromazine values.

Table 2. Patient characteristics (K=23 studies)

	Mean	95% Confidence Interval
Gender: % male	66.1	59.5<δ<72.7
Age	34.6	32.3<δ<36.9
IQ	93.3	88.6<δ<98.0
Duration of hospitalization (months)	69.3	28.7<δ<109.9
Duration of illness (years)	9.5	7.3<δ<11.7
Daily dose of antipsychotics (chlorpromazine values)	914.9	191.7<δ<1638.1

Therapy Setting and Drop-Out Rate

Variables characterizing the therapy setting are summarized in Table 3. The mean treatment period was 15.8 weeks or 44.5 hours. The mean number of therapy sessions was 46.2 with a mean frequency of 3.4 sessions per week. These parameters were described by a relatively large variance shown by the broad confidence intervals. Accordingly, it has to be mentioned that the therapy setting varies between the studies due to the different rehabilitation status of the included patients and the wide range of the offered IPT subprograms. An additional important factor characterizing the therapy setting were the therapists participating in the studies. In 11 studies (47.8%), the professional qualifications of the therapist were stated. In all of these studies, cognitive-behavioral trained psychologists were primarily involved, and in three studies (27.3%), psychiatrists trained in IPT participated as therapist. 12 studies (52.2%) indicated the drop-out rate from the treatment period. The average drop-out rate was 16.8% (95% CI, 9.2-24.4).

Table 3. Therapy setting (K=23 studies)

	Mean	95% Confidence Interval
Duration of therapy (weeks)	15.8	10.3<δ<21.3
Duration of therapy (hours)	44.5	32.2<δ<56.8
Weekly therapy frequency	3.4	2.9<δ<3.9
Total number of sessions	46.2	34.3<δ<58.1

Effect of IPT on Global Therapy Outcome

From a clinical perspective it is always of interest wether a treatment is effective at all, that means independent of the kind of assessed variables. Therefore, we calculated the global therapy effect that represents a measurement of the extended treatment effect. The global therapy effect was defined as the mean of all assessed outcome variables of the IPT group and the control group in each study. IPT patients obtained significant within group change in the global therapy outcome that reached the level of medium effect sizes (ES). IPT had significantly higher weighted ES compared to control groups for changes from baseline to the post-treatment assessment (Q_B=11.65, *df*=1, *P*<.01, one-tailed) although the control groups showed small changes significantly differed from zero (Table 4). This supports evidence that

standard treatment of schizophrenia patients often including unspecific group activities has some measurable effects. But the IPT effects were far superior to those of control patients, indicating significant additional benefits compared to unspecific group activities. The possible influences of institutional conditions on the effects of IPT were evaluated by categorizing the studies into sub-samples concerning inpatients, outpatients, academic sites or nonacademic sites. IPT obtained medium effects in inpatient settings (K=16; ES=.54; 95% Confidence Interval [CI], .39-.69; Z=7.00; Q_w=7.36) and outpatient settings (K=6; ES=.49; 95% CI, .25-.73; Z=3.97; Q_w=1.30) as well as in studies conducted in academic sites (K=9; ES=.57; 95% CI, .36-.77; Z=5.47; Q_w=4.96) and nonacademic sites (K=12; ES=.48; 95% CI, .31-.65; Z=5.60; Q_w=3.05). Furthermore, IPT again showed medium effects in randomly controlled trials (K=13; ES=.55; 95% CI, .38-.72; Z=6.38; Q_w=4.08) as well as in studies not controlling patient allocation to the treatment conditions (K=10; ES=.51; 95% CI, .34-.67; Z=6.06; Q_w=4.48). The differences based on institutional or design conditions were not significant (Q_B <0.38, *df*=1, *NS*). Not all of the included studies assessed follow-up data. This reduction of the number of studies probably decreases the statistical power. Nevertheless, the significant superiority of the IPT group was maintained at a follow-up with an average of 6.8 months after treatment (Q_B=4.91, *df*=1, *P*<.05). This improvement of IPT patients in global therapy outcome from baseline to follow-up assessment was significantly correlated with improvement from baseline to post-therapy (Spearman's correlation, one-tailed: *r*=.94, *P*<.01, K=6). These data confirm that the level of therapy success was already determined at the end of treatment. In accordance with the therapy success, a higher global therapy outcome was also significantly related to a lower drop-out rate (*r*=-.51, *P*<.05, K=12). Furthermore, the global therapy outcome was not significantly influenced by variables of therapy setting (duration of therapy, number of therapy sessions, and therapy frequency in inpatient or outpatient settings: *r*<.23, NS, K>21) within the applied IPT conditions (see Table 3). In summary, these results support evidence of robust general positive change of IPT patients independent of setting, site conditions and study design.

Symptom Dimensions and Functional Impairments

In accordance with the integrative model underlying IPT conception, intervention effects in specific topics of the IPT subprograms representing main functional impairments of schizophrenia patients merited special attention. Also possible vertical generalization effects were of strong interest. Highly significant improvements described through medium to large effect sizes were found for the IPT groups in psychopathology, social behavior, neurocognitive and social cognitive domains, where the domain of social perception was of special interest (Table 4). Again, the control conditions showed small effects in neurocognition, social cognition and psychopathology, which all differ significantly from zero. No significant changes were found for control patients in variables addressed to social functioning. A between group comparison revealed the highest superiority of IPT groups compared to control groups in neurocognition, social cognition and social perception (Q_B >9.96, *df*=1, *P*<.01). The superiority of IPT groups compared to control groups was also evident in symptom reduction and improved social behavior (Q_B >4.23, *df*=1, *P*<.05). Significant effects in neurocognition, social perception and social functioning point to the proximal outcome that is the direct focus of IPT intervention.

Table 4. Weighted effect sizes (ES) within the IPT group and the control group (K=23)

	IPT					Control group				
	K	**N**	**ES (95% CI)**	**Z**	**Q_W**	**K**	**N**	**ES_w (95% CI)**	**Z**	**Q_W**
Global therapy effect										
Treatment phase	23	580	.52 (.40-.64)	8.66**	8.84	18	314	.19 (.04-.35)	2.43*	3.73
Treatment and follow-up phase Follow-up: M=6.8months	6	201	.58 (.38-.78)	5.66**	5.89	3	58	.08 (-.31-.47)	.41	.67
Functional impairments and psychopathology										
Neurocognitive domain	22	559	.53 (.41-.65)	8.71**	4.28	17	299	.16 (.00-.32)	1.96*	0.15
Social cognitive domain	11	230	.72 (.53-.91)	7.45**	28.16	9	172	.23 (.01-.44)	2.07*	1.84
Social perception	10	210	.74 (.54-.94)	7.27**	24.78	8	157	.26 (.03-.48)	2.27*	2.48
Social behavior	15	399	.41 (.27-.55)	5.70**	8.46	10	196	.15 (-.05-.35)	1.51	3.27
Psychopathology	19	507	.51 (.39-.64)	7.98**	12.63	13	257	.29 (.11-.46)	3.21**	4.60
Assessment formats										
Self-ratings	14	167	.55 (.40-.70)	7.29**	9.44	8	135	.24 (.00-.48)	1.95	2.91
Expert ratings	18	440	.48 (.35-.61)	7.00**	12.14	13	231	.23 (.04-.41)	2.42*	6.00
Psychological testing	22	559	.54 (.42-.66)	8.86**	16.52	17	299	.16 (.00-.32)	1.98*	5.00

Abbreviations: K, number of studies; N, number of patients; ES, weighted effect sizes within the group; 95% CI, 95% confidence interval; Z, significance-statistic within the group; Q_w, homogeneity statistics, $\chi 2$,one-tailed, df=K-3; *p<.05; **p<.01.

Correlates of the Outcome on Social Perception

On the background of the high effect sizes of IPT in social perception, the question was raised whether improvements in social perception were related to other domains of functioning. For that purpose, Spearman's correlation (one-tailed) were calculated. The results are presented in Figure 3.

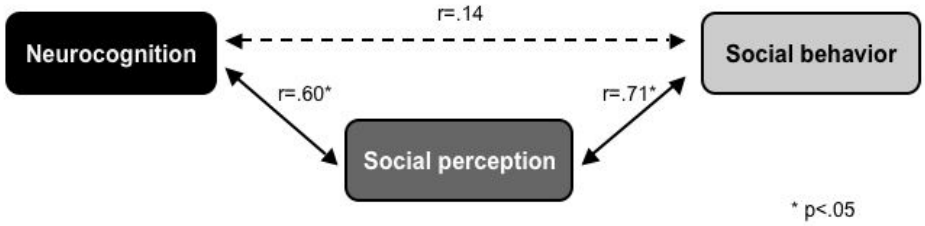

Figure 3. Spearman correlation coefficients of social perception and related functional domains and psychopathology.

Significant correlations of social perception with neurocognition (r=.60, P<.05, K=10). and social behavior (r=.71, P<.05, K=7) were obtained. On the other hand, neurocognitive variables were not related to social behavior (r=.14, NS, K=14). Consequently, these results support evidence that an improvement in social perception might be a mediating factor between improvements in neurocognition and social behavior during psychotherapy process. In the control groups none of these relationships were evident (r<.37, NS, K>7).

Assessment Formats

It is often argued, that assessed changes in psychotherapy evaluation were probably an artifact of the assessment formats of the measurements. Therefore, the effects of IPT groups were proved by the control of the used assessment formats in each study. Highly significant improvements were found favoring IPT for all three assessment formats: self-report (questionnaire), expert rating (interview with patient or related person), and psychological testing (paper-pencil or computer-based tests to assess predominantly neurocognitive and social cognitive performance) (Table 4). Moreover, the IPT effects for these three formats were markedly homogenous (Q_B =0.61, df=2, NS). Although control patients showed significant improvements in expert ratings and psychological tests, a between group analysis led to superior effects of IPT compared to controls in all assessment formats (Q_B >4.63, df=1, P<.05). Thus, a significant superiority of IPT versus the control conditions was not influenced by the assessment format of the measurements.

IPT Subprograms

In each of the studies, a variety of different IPT subprograms were provided. It was the major focus of this analysis whether schizophrenia patients have an additional benefit when participating in neurocognitive remediation combined with social perception therapy compared to neurocognitive remediation alone. For that purpose, IPT studies were selected, which included exclusively the IPT subprogram *Cognitive Differentiation* or a combination of the two subprograms *Cognitive Differentiation* and *Social Perception.* Therefore, a group therapy, which was exclusively addressed to neurocognitive domains (neurocognitive remediation approach) was compared with a group therapy, which focused a combination of neurocognitive AND social cognitive topics (integrated therapy approach). For that purpose 10 studies including 199 schizophrenia patients were selected. Three studies used the neurocognitive IPT subprogram and seven studies combined the neurocognitive and social perception IPT subprograms (Table 5).

Table 5. Weighted effect sizes (ES) within the neurocognition subprogram and combined neurocognition/social perception subprograms of IPT (K=10)

	neurocognition subprogram					combined neurocognition/ social perception subprograms				
	K	**N**	**ES_w (95% CI)**	**Z**	**Q_W**	**K**	**N**	**ES_w (95% CI)**	**Z**	**Q_W**
Global therapy effect										
Treatment phase	3	35	.47 (.00-.95)	1.96*	0.43	7	164	.58 (.36-.80)	5.16**	1.35
Functional impairments and symptom dimensions										
Neurocognitive domain	3	35	.49 (.01-.96)	2.00*	1.38	7	164	.74 (.52-.97)	6.47**	11.57
Social cognitive domain	2	20	.31 (-.31-.93)	0.97	0.57	4	86	.82 (.51-1.14)	5.16**	5.75
Social perception	2	20	.31 (-.31-.93)	0.97	0.57	4	86	.80 (.49-1.11)	5.01**	3.34
Social behavior	3	35	.27 (-.20-.74)	1.14	0.18	4	95	.40 (.11-.69)	2.73**	0.36
Psychopathology	2	20	.71 (.06-1.36)	2.13*	2.40	5	119	.57 (.31-.83)	4.29**	3.00

Abbreviations: K, number of studies; N, number of patients; ES_w, weighted effect sizes within the group; 95% CI, 95% confidence interval; Z, significance-statistic within the group; Q_w, homogeneity statistics, χ2,one-tailed, df=K-3; *p<.05; **p<.01.

Both treatment conditions obtained medium effect sizes in the global therapy effect. The combination of neurocognition and social perception subprograms showed slightly higher effects, which reached a significance level of α<.01, compared to the single neurocognition subprogram (α<.05). The effect sizes of the combined IPT programs reached again the level of high significant effects (α<.01) in all assessed domains of functional impairments and psychopathology. Patients that participated only in the neurocognitive subprogram achieved significant effects in psychopathology and in the specially focused neurocognitive domains, but not in social cognition, social perception and social behavior. The superior effects of the combined IPT subprograms compared to the single subprogram were not affected by variables of patients' characteristics and therapy setting (Mann-Whitney U Test, one-tailed: Z<1.73, NS). But it has to be mentioned, that inferential statistics are clearly underpowered, especially within the sample of three studies addressing the neurocognitive subprogram. A view on patients' characteristics and therapy setting revealed no marked differences between the two treatment conditions with the exception of the duration of therapy. The mean duration of therapy of studies offering only the neurocognition subprogram was 17.5 hours (Standard Deviation [SD] =10.9) and 45.4 hours (SD=32.8) in studies including combined subprograms.

To homogenize the compared treatment conditions we excluded in a third step of analysis all studies with more than 30 hours of therapy. Seven studies including 140 schizophrenia patients fulfilled the selection criteria of less than 30 therapy hours: the same three studies included only the neurocognition subprogram and four studies referred to the two combined IPT subprograms (neurocognition and social perception). The mean duration of therapy in IPT studies addressing combined neurocognition and social perception subprograms was reduced to 19.5 hours by study selection criteria. This quantity of hours was similar to 17.5 therapy hours offered in the studies using only the neurocognition subprogram. The results of the comparison of the two IPT conditions controlled by hours of therapy are presented in Table 6.

Table 6. Weighted effect sizes (ES) within the neurocognition subprogram and combined neurocognition/social perception subprograms of IPT controlled by therapy hours (K=7)

	neurocognition subprogram					**combined neurocognition/social perception subprograms (therapy hours≤30)**				
	K	**N**	**ES_w (95% CI)**	**Z**	**Q_W**	**K**	**N**	**ES_w (95% CI)**	**Z**	**Q_W**
Global therapy effect										
Treatment phase	3	35	.47 (.00-.95)	1.96*	0.43	4	115	.60 (.33-.86)	4.41**	0.79
Functional impairments and symptom dimensions										
Neurocognitive domain	3	35	.49 (.01-.96)	2.00*	1.38	4	115	.76 (.50-1.03)	5.56**	6.86
Social cognitive domain	2	20	.31 (-.31-.93)	0.97	0.57	2	60	.64 (.27-1.00)	3.40**	4.20
Social perception	2	20	.31 (-.31-.93)	0.97	0.57	2	60	.64 (.27-1.00)	3.40**	4.20
Social behavior	3	35	.27 (-.20-.74)	1.14	0.18	2	63	.37 (.02-.73)	2.08*	0.21
Psychopathology	2	20	.71 (.06-1.36)	2.13*	2.40	2	70	.69 (.35-1.04)	3.97**	1.79

Abbreviations: K, number of studies; N, number of patients; ES_w, weighted effect sizes within the group; 95% CI, 95% confidence interval; Z, significance-statistic within the group; Q_w, homogeneity statistics, χ2,one-tailed, df=K-3; *p<.05; **p<.01.

The effects of the neurocognition subprogram are identical with those of the treatment comparison uncontrolled by hours of therapy that were described above (Table 5). The effect sizes of the combined subprograms were not affected by the duration of therapy. All assessed functional domains and psychopathology reached the significance level of α<.01, with the exception of the domain of social behavior wherein smaller but still significant effect sizes (α<.05) could be obtained. Of special interest were the medium to large effect sizes in the areas of neurocognition and social perception of the combined subprograms compared with the small to medium effect sizes in the only neurocognition subprogram condition. These results support evidence that in neurocognitive therapy schizophrenia patients benefit when they are additionally treated in social perception. The benefits could be measured in the therapy specific topics of social perception as well as in the broader domains of social cognition and neurocognition. Additionally, the drop-out rates were influenced by the treatment conditions: only 11.8% of the patients participated in the combined subprograms compared to 22.2% in the the neurocognition subprogram dropped out of treatment.

DISCUSSION

The social perception therapy that is presented in this paper has to be firstly discussed within the broad scope of the integrated cognitive-behavioral group therapy approach of IPT conception. Therefore, the question is whether IPT and its subprograms are effective, and how the effects of IPT have to be appraised in comparison to other, predominantly cognitive-behavioral, therapy approaches for schizophrenia.

The results indicate successful global therapy outcome of IPT compared to control groups. Although clinical studies have shown higher effects for schizophrenia patients in unspecific group activities (placebo-attention conditions) than for patients receiving standard treatment (Spaulding et al., 1999; Wykes et al., 1999), the results demonstrate patients additional benefits of IPT compared to non-specific group therapy and standard care. IPT yielded significantly higher global therapy effects, which were present both following the completion of therapy and were sustained at follow-up. These results provide support for the effectiveness of IPT independent of clinical settings, site conditions and study design.

IPT differs from most other psychosocial treatment approaches for schizophrenia in the integration of cognitive and psychosocial rehabilitation methods, which focus on neurocognition, social perception and social behavior topics. In contrast, family intervention, CBT for (persistent) positive symptoms, social skills training, and neurocognitive rehabilitation programs have primarily been delivered as non-integrated, independent programs. Meta-analyses have generally supported the effectiveness of family intervention and CBT for positive symptoms (Gould et al., 2001; Pilling et al., 2002a; Pitschel-Walz et al., 2001; Rector & Beck, 2001; Zimmermann et al., 2005); the data supporting social skills training and neurocognitive remediation are still weaker (Benton & Schroeder, 1990; Dilk & Bond, 1996; Kurtz et al., 2001; Krabbendam & Aleman, 2003a; Twamley et al., 2003), and are the topic of some controversial debate (Krabbendam & Aleman, 2003b; Mueser & Penn, 2004; Pilling et al., 2002b). But a recently published meta-analysis by Pfammatter and collegues (2006) supports efficacy for all of the four discussed CBT approaches.

In meta-analyses of these non-integrated approaches, assessments are mostly limited to measurements of the specifically targeted intervention topics: for example, the documented success of CBT for positive symptoms is often reduced to symptom reduction, that of neurocognitive remediation to improved neurocognitive functioning, and studies on social skills trainings rarely assess neurocognitive and social cognitive functioning.

On this background, the present findings are of interest considering that the subprograms that comprise IPT focus primarily on neurocognitive remediation, social perception and social skills training. Accordingly, variables representing all these intervention topics as well as psychopathology were assessed. The strong effects of IPT on neurocognitive functioning, social cognition and perception, social behavior and psychopathology reported in the present meta-analysis, in light of the weaker effects of neurocognitive rehabilitation or skills training interventions reported in some other meta-analyses, suggest that the integration of neurocognitive remediation including social cognitive topics and psychosocial skills training may work synergistically to improve both domains more effectively than either intervention alone. This tentative conclusion is in line with a recent study by Hogarty and colleagues (Hogarty et al., 2004). They found that cognitive enhancement therapy (CET), which combines computer-based cognitive training exercises with individual and group work on

social cognition and psychosocial skills development, had a significant impact on neurocognitive and social cognitive functioning and psychosocial adjustment. The results of both IPT and CET evaluation support the recommendation of integrative interventions on different functional domains in schizophrenia patients.

Operationalized Variables and Assessment Formats

All IPT subprograms were found to have superior effects on all assessed outcome domains compared to control conditions. But in line with other meta-analyses, the IPT effects in social functioning (social behavior) tend to be smaller than in neurocognition and in psychopathology (Mojabai et al., 1998; Pilling et al., 2002a,b). Most notably, the measurement of social functioning is problematic and difficult to operationalize (Bustillo et al., 2001; McKibbin et al., 2004; Mueller & Roder, 2007). For example, the assessment of change in everyday social behavior during therapy is a challenging objective in psychosocial research. Social perception deficits were assessed predominantly by commonly used social or emotional picture tasks (cf. Roder et al., 2002a; van der Gaag, 1992) or by exquisite newly developed tests as for example the Social Perception Scale ([SPS] Garcia et al., 2003). No differences were found between expert ratings and self-reports. Most of the ratings used in IPT studies focused on social behavior and psychopathology. Studies of neurocognitive functioning have generally failed to find a strong association between self-ratings and objective performance in different neurocognitive domains Medalia & Lim, 2004; Prouteau et al., 2004). Thus, expert-ratings and self-reports may converge more in some areas of functioning, such as social behavior than others, such as neurocognition. In addition, it has been suggested that neurocognitive impairment may moderate the relationship between self-ratings and objective ratings of functional behavior (Brekke et al., 1993).

Innovations in Social Perception Therapy for Schizophrenia Patients

The presented meta-analysis probably represents the first quantitative review of specifically targeted interventions on social perception in schizophrenia patients. Including the total sample (23 studies) in the analysis, IPT showed clearly favorable effects in all assessed functional domains and psychopathology compared to control groups. But the strongest effects were obvious in social cognition and social perception. On the background of empirical findings referring to impairments in social cognition and especially in social perception of people with schizophrenia (Edwards et al., 2002a,b; Leonhard & Corrigan, 2001; Nelson et al., 2007; Penn & Corrigan, 2001), this result supports the assumption that interventions in social cognition and social perception within IPT procedure could have decisive impact on other treatment modalities of schizophrenia patients.

The comparison of the neurocognitive IPT subprogram with the combined neurocognition and social perception subprograms revealed marked differences between the two treatment conditions in neurocognition, social cognition and social perception outcome. Patients participating in the combined subprograms obtained effect sizes double as high as those receiving only the neurocognition subprogram. The outcome in social perception through this analysis is in line with the general findings in the psychosocial rehabilitation

field that interventions have their greatest effect on the proximal outcomes that are the most immediate focus of intervention (Bustillo et al., 2001; Mueser et al., 1997). This was also evident in several single IPT studies (Funke et al., 1989; Garcia et al., 2003). Furthermore, the improvements of IPT patients in social perception are in accordance with results of the computerized Emotion Training Program by Silver et al. (2004), a multi media program using core facial expressions for individual treatment of emotion recognition.

In our analysis it was some kind of surprising that the combined subprograms showed also marked higher effect sizes in neurocognitive domains compared with the neurocognitive subprogram only. This result is in accordance with the findings by Hodel and Brenner (1994), who evaluated the Emotional Management Therapy (EMT). For the explanation of these results the use of a information processing model could be helpful, which is not a linear but systemic wherein information passes up, down and across the system's organizational levels as it was proposed by Spaulding and Poland (2001). The treatment in neurocognition and social perception both improves patients functioning in the respective domain. Additionally, the improvement in social perception generalizes to neurocognitive fields. It also has to be mentioned that IPT is a group therapy approach, which per se generates "hot" cognitions by using group exercises. Thereby, IPT procedure stimulates a more naturalistic context by including realistic social topics in the presentation of social stimuli within social perception training compared with computer-based individual treatments. This may be one of the reasons why Silver et al. (2004) found no relationship between improvement in emotion recognition and neurocognition.

Furthermore, improvement in social perception was significantly correlated with improvement in neurocognition and social behavior. But no relationship was evident between neurocognition and social behavior. This result seems to stay in line with integrative models (Brenner et al., 1992; Green & Nuechterlein, 1999) and empirical results (Addington et al., 2006; Brekke et al., 2005; Bruene, 2005; Vauth et al., 2004) about schizophrenia. But there is one major difference: in general, the empirical foundation of most integrative models is reduced on the analysis of the cross-sectional measured aspects of schizophrenia disorder. The correlations presented in this paper refer to IPT patients observed change over time. "Change" indicates at least two time measurements to describe longitudinal treatment effects. Therefore, integrative models refer to possible interactions of different functional impairments at baseline within therapy process. Consequently, the improvements in different functional domains during successful broad-based integrative therapy are as pervasive as are functional impairments at baseline. This confirms the therapy conception underlying IPT (Brenner et al., 1992), which was developed more than 25 years ago and has recommended the inclusion of social cognitive therapy topics.

The results of this analysis point to the advantage of additional social perception therapy and support evidence to the assumption that improvements in social perception (social cognition) represent a moderating factor between improvements in neurocognition and social behavior. In accordance with recent studies (cf. Bell et al., 2001; Bellack et al., 2001; Heinssen et al., 2001; Hogarty et al., 2004; Kern et al., 2002; Liddle, 2000; McGurk et al., 2005; Prouteau et al., 2005; Semkovska et al., 2004; Vauth et al., 2004; Velligan et al., 2000; Wykes et al., 2001), these results further support the hypothesized generalization of improved neurocognition, social cognition and social skills to real life social behavior, and suggest that improving the distal outcome of social functioning requires the close integration of social and neurocognitive rehabilitation, such as it is done in IPT. Thereby, the treatment motivation of

the patients may have been worked as an unspecific moderator variable on outcome. This assumption is supported by empirical results from our own research group and from others (Medlia & Richardson, 2005; Roder et al., 2001, 2006c). The combination of neurocognition and social cognition (social perception) therapy may have better met the needs and interests of the patients. Consequently, the treatment motivation of the patients increased. On the background that outcome in psychopathology did not differ between the two IPT variations, the treatment motivation is probably the main factor related with the drop-out rate of schizophrenia patients as it is empirically evident for the therapy of patients with other DSM diagnoses (Bados et al., 2007).

Clinical Implications

During the 1980s, the frequency of IPT therapy varied between two to five sessions a week. In recent years, however, a reduced regime of two weekly IPT sessions has become accepted as standard. The use of a combination of only some IPT subprograms for homogeneously selected patient groups, based on a behavioral and problem analysis (Roder et al., 2002a), would appear reasonable, efficient, and a cost-effective treatment approach. For example, at the University Psychiatric Services Bern, we have successfully implemented the combination of the neurocognition and the social perception subprogram into standard treatment of inpatients and outpatients. In case of more heterogeneous groups of patients with impaired functioning in different areas, the application of the complete IPT would appear to be reasonable. Furthermore, the broad scope of IPT, including neurocognitive, social cognitive, and psychosocial components, renders it suitable for patients in various states of illness and with specific rehabilitation needs within all kinds of psychiatric cares. Therefore, IPT may be useful in closing the gap between selective neurocognitive or psychosocial interventions and non-specific rehabilitation approaches in standard care for schizophrenia patients.

Perspectives For Future Research

This meta-analysis included all IPT studies on social perception independent of the rigor of methodological design. No differences of the IPT effects were found in randomized controlled trials compared to not rigorously controlled patient allocation in other studies. But it can be argued that the inclusion of not randomized controlled studies may limit the evidence of the results. The goal of the analysis was rather to prove effectiveness of IPT and its subprograms than efficacy in randomized controlled trials. That’s why we included studies realized in academic and non-academic sites. However, the effects of IPT tended to be stronger for studies carried out in academic centers than in non-academic ones. This result is in line with other findings (Mojtabai et al., 1998), and points to the need to conduct “effectiveness” research in non-academic sites, which presumably has higher generalizability to routine clinical settings where most patients are treated (Wells et al., 1999). In some analyzed subcategories only few IPT studies could be included such as in the comparison of neurocognition and social perception subprograms. On the background of the limited research in social perception therapy for schizophrenia patients, replication studies could be helpful.

The inferential statistical testing in this study had only modest power. But this methodological problem can be always found in quantitative analyses. Hence, the inferential statistic results are tentative and have to be confirmed in single studies with adequate sample sizes. To date, authoritative statements pertaining to differential treatment indication are lacking. These studies have to take into consideration the individual course of rehabilitation, the impact of therapeutic variables, and relapse prevention.

As a further step our research group is interested whether additional therapy topics addressing social cognition and neurocognition help to optimize treatment effects. On the basis of the different neurocognitive and social cognitive domains defined by the NIMH-MATRICS initiative (Green et al., 2005; Nuechterlein et al., 2004) we developed the Integrated Neurocognitive Therapy (INT [Roder et al., 2006b]) for schizophrenia patients, as further development of IPT (see Figure 4). We included group therapy and individual therapy, which both are partly computer-based. Different neurocognitive functions in daily life (speed of processing, attention and vigilance, working memory, verbal and visual learning and memory, reasoning and problem solving) are integrated with social cognitive functions (emotional processing, social perception, theory of mind, social schema, attribution). In both treatment areas of neurocognition and social cognition, INT interventions are based on activating patients' resources and enhancing intrinsic motivation. INT is actually evaluated in an international multi-center study*.

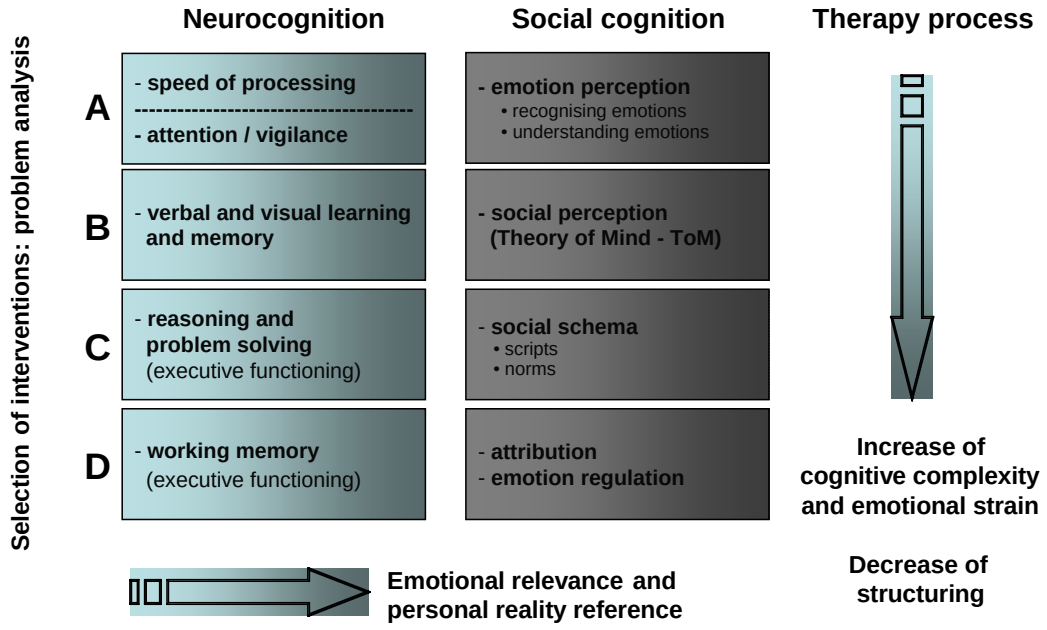

Figure 4. Integrated Neurocognitive Therapy (INT)

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Chapter 4

HOW CHILDREN PERCEIVE OTHERS: A PERSPECTIVE BASED ON SOCIAL INFORMATION PROCESSING

Marina Camodeca[1] and Frits A. Goossens[2]
[1]Department of Biomedical Sciences, University of Chiete, Italy
[2]Department of Special Education, Vrije University, Amsterdam

ABSTRACT

The main focus of the present contribution is on the way in which children perceive and understand social situations and on how this perception can be the basis of children social behavior. Therefore, a deep comprehension of social perception could be extremely useful to uncover also consequent behavior and to cope with undesired actions.

Social information processing (SIP) theory (Crick & Dodge, 1994; Dodge, 1986) seems particularly helpful for this purpose. It is supposed to take place in six steps, in a circular formula. According to this approach, children code social cues, give them meaning through interpretation of others' intents and causal attributions, clarify their goals, search for possible responses and choose one of them. Finally, they enact the behavior chosen, and the cycle starts again.

Processing the whole SIP cycle in a skillful way leads to social competence, whereas biased processing may lead to aggression and social deviance. This contribution is aimed at giving a particular attention to the way in which different behaviors may have origins in social perception. In particular, we considered how aggressive children and children involved in bullying perceive social situations and respond to them.

Following elaborations enhanced the SIP model by considering also the role of emotion (Lemerise & Arsenio, 2000) and morality (Arsenio & Lemerise, 2004). Consequently, all the steps in the process are affected by emotions and moral judgments, which, together with social cognition, influence behavior.

Finally, after explaining how children perceive social situation and intentions, we will focus on how they perceive their peers. Actually, it seems that particular characteristics of others elicit specific responses and therefore contribute to shape social behavior.

INTRODUCTION

In this chapter we will not intend *perception* as a pure sensorial action (i.e. seeing, listening, etc.), but more broadly as "comprehension", "cognition". Through senses people can understand the world: we want to talk about this knowledge.

We can define social perception as the process through which we use available information to form impressions of other people, to assess what they are like. We will not refer to physical characteristics that form impression, but on a broader system of characteristics which belong to the target (i.e. physical aspect), to the perceiver (i.e. personal memories), to the situations (i.e. conflict or friendship), to behavior and interaction features.

We are going to talk about children of 6-10 years old who live in social contexts and need to interact with their peers, most of the time when adults are absent. The interactions with other peers allow children to learn how to behave properly, because groups of peers have norms and rules to conform to. Through different experiences, children develop a particular way to perceive social interaction and to cope with social situations. Sometimes, this modality leads to social competence and well-being, other times it may be a wrong modality which leads to aggression or victimization.

Children perceive others on the basis of their own personal beliefs and knowledge about a particular group, and use these perceptions to interpret social situations and behave consequently (LaFontana & Cillessen, 2002). Social experiences are transformed into cognitive representations of relationships, which guide perception in social and interpersonal contexts. Social perceptions have been considered as an aspect of cognitive representations of relationships (Rudolph, Hammen & Burge, 1995).

We will make use of a socio-cognitive approach, more in particularly of the *social information processing* (SIP) theory. The perspective at the basis is that social perceptions and attributions influence social cognition, and vice versa, and all these, on their side, influence behavior, which, again, affects perception and cognition. The SIP model considers the whole cycle of interpreting and responding to a social interaction, starting from the perceptions of others and others' actions. Furthermore, it appeared to be appropriate for the uncovering of social competence and social maladjustment, in particular aggression.

Actually, the way in which children behave is directly associated to the way in which they perceive social situations. More specifically, children respond to provocations on the basis of their perceptions of the intention of the peer. They will tend to respond with aggression if they consider the peer acting with hostile intent, but they will be more likely to act prosocially or assertively if they perceive the peer acting with a benign intent, or accidentally. As Dodge, Murphy and Buchsbaum (1984, p. 171) claimed "it is a child's perception of a peer's intentions, not the peer's actual intention, that determines that child's behavioral response to a provocation". Or, similarly, it seems that children do not respond aggressively to consequences (e.g. accidents), but to "their perceptions of the actor's intent" (Arsenio & Lemerise, 2001, p. 65)

We will talk about *perceptions* in several domains throughout the text: perceptions of intents, of others' intention, of social cues, of others, of others' characteristics, and so on. There will not be a particular paragraph on *social perception*, just because the work itself is on how behavior is produced as a consequence of perceiving the social world around.

THE SOCIAL INFORMATION PROCESSING THEORY

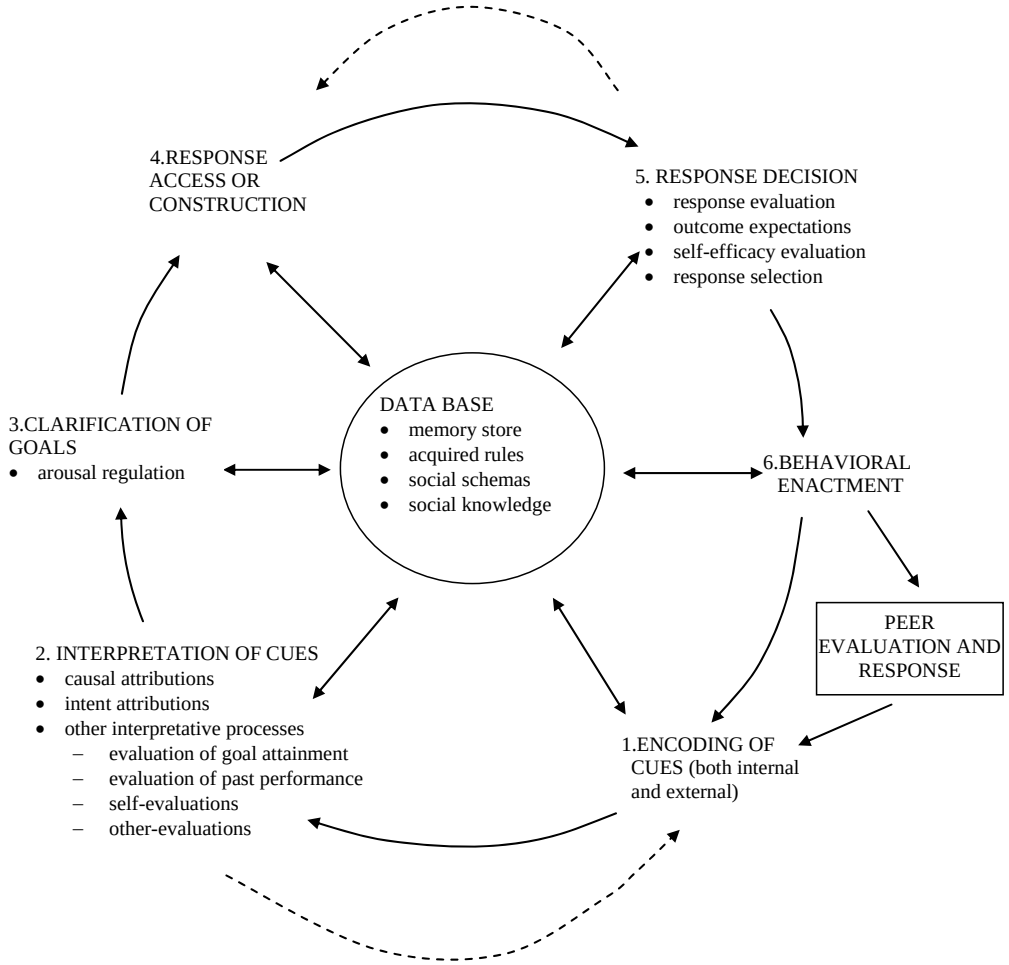
As we have introduced, in social contexts, children interact with adults and peers. Each behavior needs therefore to be interpreted. Children make inferences about others and perceive them in a particular way which depends on previous experiences, individual differences, social environment, personal reference schemas. Finally, children are guided by these interpretations to behave consequently.

The social information processing (SIP) theory seems to be particularly proper to explain how "individual perceive the world around them and process information about it" (Palmer, 2005, p. 357). Many studies that used this framework found out that processing social information in a skillful way is associated to social competence, while biased processing may lead to maladjustment, aggression and social deviance. In this context we can define social competence as "the ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships with significant others" (Rubin, Bream & Rose-Krasnor, 1991, p. 222).

The SIP approach was developed by Dodge (1986) and reformulated by Crick and Dodge (1994). It makes it possible to study different aspects of social processing, explaining, therefore, the pathways leading from, for example, early deficits in perception and interpretation and later performance. The SIP model has been widely applied in several domains to explain the thinking of aggressive children (Crick & Dodge, 1999; Pakaslahti, 2000; Pettit, Polaha & Mize., 2001), rejected children (Crick & Ladd, 1990; 1993), bullies and victims (Camodeca & Goossens, 2005; Camodeca, Goossens, Schuengel & Meerum Terwogt, 2003). Furthermore, it has been enriched with the inclusion of emotion (Lemerise & Arsenio, 2000) and morality (Arsenio & Lemerise, 2004). Taking all of this into account explains why this model reached popularity among developmental researchers who deal with social cognition, emotion and maladjusted behavior.

The SIP model consists of six steps in a circular formula, as seen in Figure 1. Each step influences the following one; where feedback occurs (e.g. between step 2 and step 1, and between step 5 and step 4) the previous step can be revised. The SIP is influenced by past events and social experiences (e.g. attachment patterns, rejection), which are stored in the long-term memory in the form of social knowledge. The sum of all the memories generates the latent mental structures, which constitute a database (made up of schemata, scripts or working models). This, in its turn, guides children's social processing and consequently their social behavior. The representation of the final social behavior is stored in the memory and becomes part of children's social knowledge for future actions.

The way in which children perform each step contributes to the final outcome of the whole process. Thus, biases in processing in any step may result in maladjusted behavior (such as aggression, rejection, bullying), as we will discuss later in this chapter. In the following we will describe in more detail the first five steps of the SIP, which refer to mental processes (the sixth indicates the final behavioral enactment resulting from the whole cycle). We focus not only on the characteristics of each step, but also on the deficits which aggressive or maladjusted children may have in each step.



Note. From "A review and reformulation of social information-processing mechanisms in children's social adjustment", by N. R. Crick and K. A. Dodge, 1994, *Psychological Bulletin, 115,* p. 76. Copyright 1994 by the American Psychological Association. Reprinted with permission.

Figure 1. Crick and Dodge's social information processing model of children's social adjustment.

In *step 1* children focus on particular cues perceived in the social situation (such as provocation by a peer or rough and tumble play), encode them, and select the most relevant ones. They are guided by schemata ("memory structures that organize information in a way that facilitates comprehension", Crick & Dodge, 1994, p. 83) and memory, to which new information is compared. Children also focus their attention on particular cues, and therefore it is possible that a maladjusted child just selects the aversive act, while another child may focus on more cues, such as the context or the intention of the other's act.

In *step 2* children interpret these social cues, i.e. attribute causal reasons to events, attribute intentions to others' acts, and try to understand why a social event occurred (Crick & Dodge, 1994). We think that step 2 is the most relevant in view of the present work on social perception, because the way in which children perceive others is supposed to guide their behavior. Therefore, if a child think that the other person behaved in a nice way toward him/her, it will be more likely that a social competent interaction takes place or a kind

response is given. On the other hand, if a child perceives an ambiguous action towards him/her (e.g. He/she is stripped over by a classmate passing by, but no cues of intentionality are provided) as hostile and carried on purposely, he/she might respond aggressively, or unkindly, or in a way which can hinder the future interaction. Therefore social relations, including social competence, aggression, maladjustment, may develop from benign/hostile attributions of social, ambiguous, cues. For this reasons, it seems extremely important to detect and understand how children perceive others' actions, especially in view of the fact that "hostile attributions of intent are believed to cause aggressive behavior, to instigate more problematic and social interactions, and thereby to limit non-aggressive interactions that could serve to learn prosocial behavior (Orobio de Castro, 2000, p. 24). Children tend to respond not just to the action itself, but to their *perception* of the action (Dodge et al., 1984). Moreover, there is evidence that children differ in their perceptions of social situations and in following interpretations of social events, as will be shown in the following paragraphs.

In *step 3* children select a goal they want to achieve, which can be internal (e.g. feeling happy, avoiding embarrassment), or external (e.g. winning a game, being the first in a line of some children to drink at a water fountain). The goal can be prosocial, antisocial or neutral on the basis of the consequences it produces. Children who are positively socially adjusted usually formulate goals aimed at enhancing the relationship with others (e.g. playing together, cooperating, caring about keeping friendship) while maladjusted or aggressive children are more prone to choose goals that are perceived to reach instrumental aim (e.g. taking back the place in a line if pushed away by someone, even if with the use of strength), or that damage the relationship (e.g. winning over others).

In *step 4* children access responses from their long-term memory or create new responses if the situation is new. Children may differ from each other in the number of responses they can produce, in the response content and in the response order. It seems that prosocial children produce more numerous and more competent responses (friendlier, less aggressive). It has also been found that if children take time to reflect not only they produce more responses, but also they find more prosocial and less aggressive responses (Camodeca et al., 2003).

Once children have produced a fair number of responses, they evaluate them in order to choose the response they think is the best one in that situation (*step 5*). To select a response, children consider:

the value attributed to the content of the response. Children decide to respond in a certain way if they think this is fair or acceptable. Sometimes, they are subjected to the group pressures (e.g. in teasing a peer) and convince themselves that this is the right behavior, because it is legitimized by others. In this way they may avoid guilt feelings. This way of responding is typical of children with low levels of morality, who think aggression is acceptable, evaluate maladaptive behaviors favorably, and avoid in this way feelings of guilt and shame (Di Norcia, 2006). We will come back to this point, talking about moral values.

their own self-efficacy in performing it. In order to succeed in a particular behavior, children have to feel able to perform it, otherwise it will be a failure. Therefore, "feelings of self-efficacy are hypothesized to be one of the criteria that children use to evaluate responses before enactment" (Crick & Dodge, 1994, p. 90). While prosocial, competent children usually feel self-confident in responding assertively, maladjusted children (e.g., bullies and victims, cf. Camodeca & Goossens, 2005) feel more confident in being able to respond aggressively.

the outcome they expect from it. A certain response will be more likely to be produced if it is supposed to lead to the desired outcome. For example, a child may like to respond with aggression to a provocation in order to keep his/her place in a line. However, thinking about it, he/she resolves that aggression may not bring him/her the desired outcome; on the contrary, it may exacerbate the relationship with the other child. It seems that aggressive children, in comparison to their peers, tend to expect more favorable results from behaving aggressively and less positive outcomes from behaving prosocially.

Once the response is evaluated and definitely chosen, children will perform it in *step 6*. This last step of the SIP model is therefore not a mental one as the previous steps, because the behavioral enactment takes place. This final behavior produces effects and feedbacks, which, in turn, give way to new cues to be encoded, interpreted and for which a new response is necessary. According to Crick and Dodge (1994), individuals are constantly involved in social information processing activities, which appear to have both parallel and cyclical structures.

The whole process takes place in an automated way and children do not think constantly and consciously about each step before acting. In the model, each step leads to the next one and is linked to the previous one. Thus, for instance, if a child attributes a hostile intention to a peer, he/she is likely to retaliate and will choose an antisocial goal. Consequently, he/she will create an aggressive response, will probably feel self-confident in using aggression and will evaluate the aggressive response as the most proper. As a consequence, he/she will indeed behave aggressively.

Usually, to measure the steps of SIP, researchers use stories involving at least two peers, in the form of provocative scenarios (in which the children are the victim of an act that was deliberately directed against them) and ambiguous scenarios (in which the intention of the child responsible for the negative action is not clear). Table 1 shows examples of provocative and ambiguous behavior (Camodeca & Goossens, 2005; Camodeca et al., 2003; Orobio de Castro, 2000).

Table 1. Examples of scenarios and following questions to ask children

Type of scenarios	Example of scenario	Possible questions to ask children
PROVOCATIVE	"You are talking with a friend when another classmate walks past and starts calling you names. He/she has recently started doing this"	1) What would you do? 2) What else could you do? 3) What do you think is the best thing to do? (Prompted response selection)
AMBIGUOUS	"You are on your way to school when you see that your shoe laces are untied. You leave your bag on the ground while you tie them. Your favorite book falls out of the bag. At that moment another child passes by and steps on your book. Now there are footmarks on it. You look up and see this child looking at your book and then at you"	1) Why did that child do that? 2) Do you think the other child is mean? 3) Do you think that he/she did it on purpose? 4) What would you do now? 5) How important is it for you to forget as soon possible/ to retaliate for what he/she did? 6) Is it easy for you to behave this way? 7) Do you think this behavior is successful to reach your aim?

Note. Questions are interchangeable between the two types of scenarios, but 1), 2) and 3) in ambiguous scenarios are specifically supposed to test attribution of intent, which should be clear in provocative stories.

INDIVIDUAL DIFFERENCES

The way in which children perceive other persons and the interactions with them and, consequently, process social information is subject to deep differences among individuals, which are associated to different final behaviors. We have explained the six steps of the SIP as they occur in a normative process, but the SIP model, as already underlined, is particularly indicated for uncovering cognitive (but also emotional and moral, as we will see) biases in maladjusted children.

In all the steps, children interpret situations according to the focus of their attention, to their temperament, to past events, to memories, to personal explanations they give to the situations, to generalized experiences (*scripts*) which help in understanding the actual experience and to represent reality. Differences in these processes of perception, understanding, attributions, are the basis for individual differences in social competence and in aggression. "Perceptions of provocations are known to vary according to individual difference variables of the perceiver and the actor" (Dodge et al., 1984, p.164). As it has been demonstrated, although it is normal that children differ from each other in perceiving peers and in responding accordingly, there are children who systematically present biases in the process. We are therefore interested in uncovering these differences in particular children considered at risk of maladjustment. We are going to describe now how processing each step may be biased in aggressive and rejected children. Later on, we will focus on particular types of aggressive children: reactively and proactively aggressive children, and children involved in bullying.

Maladjusted Children: Aggression and Rejection

In this paragraph we take as example aggressive and rejected children. We decided to combine aggressive and rejected children, meaning with "rejected", especially "aggressive rejected" children, who are not liked also because of their disruptive and antisocial behavior. It seems that their SIP pattern is similar for aggressive and rejected children, who both seem to show biases in processing social information. In all the steps of the SIP, aggressive and (aggressive) rejected children seem more oriented to aggression and low competence in comparison to their prosocial or well adjusted classmates (Di Norcia, 2006).

Deficits in processing information and aggressive behaviors mutually influence each other: aggressive and rejected children perceive, interpret and choose responses in a way that increases their likelihood of engaging in aggressive acts (Crick & Dodge, 1994; Crick et al., 1999). Many studies investigated the way in which children process social information and eventually whether biases at different stages may lead to (or be the cause of) aggression, or general maladjustment (Crick & Ladd, 1990; Dodge & Crick, 1990; Orobio de Castro, Veerman, Koops, Bosch, Monshouwer, 2002; Perry, Perry & Rasmussen, 1986; Pettit et al., 2001; Salzer Burks, Laird, Dodge, Pettit & Bates, 1999; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999). In the following we will describe the deficits which aggressive or maladjusted children may have in each step.

In *step 1*, maladjusted children focus only on aggressive cues and search for fewer social cues than well adjusted children. Furthermore, often, rejected aggressive children

overestimate their behavioral competence, showing not only a bias in perceiving others, but also in perceiving themselves. A study about perceptions of aggression (Lochman, 1987) found out that aggressive boys have perceptual and attributional biases of their own and of their peers' levels of aggression. They would perceive lower levels of their own aggression and higher levels of peers' aggression, as compared to non-aggressive boys, who, on the other hand, tend to attribute to themselves higher levels or responsibility. This different perception may motivate non-aggressive children to avoid hostility, but may lead aggressive children to feel hostility and to respond with aggression. Therefore, maladjusted children interpret social cues as hostile (*step 2*), attribute hostile intentions to the perpetrator and blame him/her in ambiguous situations: the peer is perceived as a threat. The reason why rejected children present biases in attribution of others' intents may lie in the fact that the stability of the social status condition make these children used to be harassed and to view peers as the cause of their difficulties and maladjustment. Therefore, they may anticipate an action towards them as hostile, even if this was not originally meant by their peers (Crick & Ladd, 1993).

This attributional bias influences the following step. Children who perceive hostile intents even when these are not meant and the cue is ambiguous, are more likely to choose an antisocial goal (*step 3*) and to display externalizing problems (Salzer Burks et al., 1999). Therefore, while children who are socially adjusted usually formulate goals aimed at enhancing the relationship with others (e.g. playing together, cooperating), maladjusted or aggressive children are more prone to choose goals that damage the relationship (e.g. retaliation, fighting). In *step 4*, when children think about the possible responses, aggressive children access a smaller number of responses than non-aggressive peers and these responses are usually unfriendly and aggressive. When children need to choose the best response (*step 5*), aggressive children evaluate aggressive responses more favorably than other children, feel more self-confident in acting out aggressive responses and expect more positive outcomes from them. The final behavior in *step 6*, as a result of all the preceding steps, is likely to be an aggressive or hostile act, which, in its turn, contributes to give way a new, maladjusted, cycle.

Reactively and Proactively Aggressive Children

Talking about aggression, it is useful to distinguish about reasons, outcomes and ways in which this aggression is enacted. One of the most common distinctions is the one between *reactive* and *proactive* aggression, proposed by Dodge and Coie (1987) and used by Dodge and his colleagues later on, as well as by other researchers (Brendgen, Vitaro, Tremblay & Lavoie, 2001; Brown, Atkins, Osborne & Milnamow, 1996; Camodeca, Goossens, Meerum Terwogt & Schuengel, 2002; Dodge, Lochman, Harnish, Bates & Pettit, 1997; Little, Jones, Henrich & Hawley, 2003; Price & Dodge, 1989; Pulkkinen, 1996; Salmivalli & Nieminen, 2002).

Reactive aggression is a "hot-headed" type of aggression, defensive, retaliatory, characterized by outbursts of anger and not effective in stopping the provocation, while proactive aggression is a "cold-blooded" type of aggression, goal-oriented and usually effective to reach aims. Proactive aggression may be subdivided into instrumental aggression (aimed at obtaining an object or privilege) and bullying (person-directed, with the aim of intimidating or dominating) (Brown et al., 1996; Price & Dodge, 1989). Although it might seem that the constructs of bullying and proactive aggression overlap, in fact proactive

aggression refers to behavior enacted at a particular moment, whereas being a bully is a social role, which stretches out over time. Nevertheless, proactive aggression as a characteristic of a child does include frequently engaging in bullying.

Further differences in aggression have also been found in studies on social cognition which compared social information processing by reactively and proactively aggressive children (Crick & Dodge, 1996; Dodge & Coie, 1987; Dodge et al., 1997). Reactively aggressive children seem to present deficits in the first steps of SIP: they encoded social situations in a less accurate way (*step 1*) and, overall, they attributed more hostile intents to their peers in ambiguous situations (*step 2*), compared to non-aggressive children and to proactively aggressive children. These inaccurate interpretations make the child over-react with anger and counter-aggression, which seem inappropriate to others (Dodge & Coie, 1987).

On the other hand, proactively aggressive children were more prone to choose antisocial goals to harass others (*step 3*), to construct aggressive and antisocial responses (*step 4*), to evaluate outcomes of aggressive behaviors positively and aggression itself as a valid mean to reach goals, and to feel self-confident in behaving aggressively (*step 5*). These biased patterns in the final steps of the SIP indicate that proactively aggressive children view aggression as an effective and easy way to achieve their aims

Children Involved in Bullying

The phenomenon of bullying is present in all age groups and in many different situations. It is characterized by aggressive behavior towards those who are considered weaker and who are unable to respond. According to Olweus' definition "a person is being bullied or victimized when he or she is exposed, repeatedly and over time, to negative action on the part of one or more persons" (1991, p. 413). Considering the amount of research on bullying in the last decades (Farrington, 1993; Smith et al., 1999; Olweus, 1993; Wolke, Woods, Bloomfield & Karstadt, 2000), we can say that bullying is a particular form of aggression, aiming at harming, unjustified, intentional and unprovoked, frequent and repeated over time, in which the victims are oppressed by force or threats, are perceived to be weaker or less powerful than the bullies and are unable to defend themselves. Bullying can take the forms of physical, verbal and relational harassment.

Although the first studies on bullying had focused on the characteristics of the bully and the victims, more recent research claims that the entire group is involved and everyone plays a role, either in reinforcing the bully or in helping the victim, or simply in acting as the "necessary public" (Craig & Pepler, 1995; Menesini & Gini, 2000; Salmivalli, Lagerspetz, Björkqvist, Österman & Kaukiainen, 1996; Sutton & Smith, 1999). Therefore, besides the bully and the victim, we find the follower of the bully (who laughs, incites or keeps the victim still), the defender of the victim (who consoles, shows his/her friendship and empathy, talks to the bully or gets angry with him/her), and the outsider (who pretends not to be involved or goes away when a quarrel starts). Even those children who pretend not to be involved are actually part of the scenario in which bullying takes place, through not taking sides.

Our latest research focused on the way in which these children involved in bullying perceive social situations and respond to them, using the social information processing framework (Camodeca & Goossens, 2005; Camodeca et al., 2003). Although Crick and

Dodge (1999) suggested that the SIP model could be useful to study bullying, our work was the first to provide a direct empirical support for the link between bullying and SIP.

We found that bullies and victims were more similar than it is usually thought, at least for what concerns their perception of social situations and the consequent aims and responses they produce (Camodeca & Goossens, 2005). Nevertheless, it is likely that their final behavior is different, because they have a different reputation, different values and different self-confidence.

However, it is interesting that bullies and victims interpret ambiguous situations as hostile, failing in the *second step* of social information processing. The long history of harassment to which victims are exposed may be the cause why they do not tend to perceive harm as benign or ambiguous, but their first thought is that someone wants to hurt them. As for bullies, they act in a social network which is often aggressive and deviant; therefore they may think that behaving aggressively is the norm and everyone does it on purpose. As a consequence of attribution of hostile intents, both bullies and victims turn out to select antisocial goals, such as retaliation (*step 3* of SIP). However, while bullies may find it easy to use aggressive goals to obtain an object or to achieve higher status in the peer group (Sutton, Smith & Swettenham, 1999), victims may resolve to select goals which destroy the relationship either as a result of frustration, or because they are convinced that this is indeed a successful way of defending themselves.

When children were asked about possible responses to give, to test the *fourth step* of SIP (Camodeca et al., 2003), again they seemed to be similar in choosing assertive responses less often than children not involved in bullying. We think, however, that step 4 would need further investigation. We tested the *fifth step* of SIP through two questionnaires assessing children self-confidence in behaving aggressively and assertively, and expected outcomes after acting an aggressive or prosocial behavior (Camodeca & Goossens, 2005; Perry et al., 1986). Bullies and victims seemed self-confident about behaving aggressively, maybe as a consequence of the previous SIP step: if one selects antisocial goals, it is likely that he/she feels confident of achieving them. Feeling able to use aggression is in line with the role of bullies (Perry et al., 1986), but it is unlikely that victims are really able to defend themselves from attacks in an effective way (Egan & Perry, 1998; Salmivalli, Karhunen & Lagerspetz, 1996).

EMOTION AND MORALITY IN SOCIAL INFORMATION PROCESSING

Emotion

Although Crick and Dodge (1994) recognized a role to emotions in their social information processing model, they did not take them into account. Actually, children perceive others and others' actions on the basis of others' and their own moods, and are guided by their inner states to process social information. Children's social competence is influenced by emotions (Graham & Hoehn, 1995; Loeber & Coie, 2001; Weiner, 1995), in particular by the intensity with which children express and experience emotions and by the capacity of regulating them (Lemerise & Arsenio, 2000). It has been found that high intensity and low regulation of emotions are predictive of problem behaviors and social maladjustment

(Eisenberg & Fabes, 1992; Loeber & Coie, 2001; Murphy & Eisenberg, 1997; Pakaslahti, 2000; Pettit et al., 2001).

Moods and emotions cannot be considered separately from behaviors and cognitions, because the formers influence the latter and vice versa. Therefore, there are reasons to think that emotions also influence the way in which children process social information.

For these reasons it seems important to consider emotions in each step of social information processing and Lemerise and Arsenio (2000) integrated them in the SIP model, so that a new model with both emotion and cognition was developed, as presented in Figure 2.

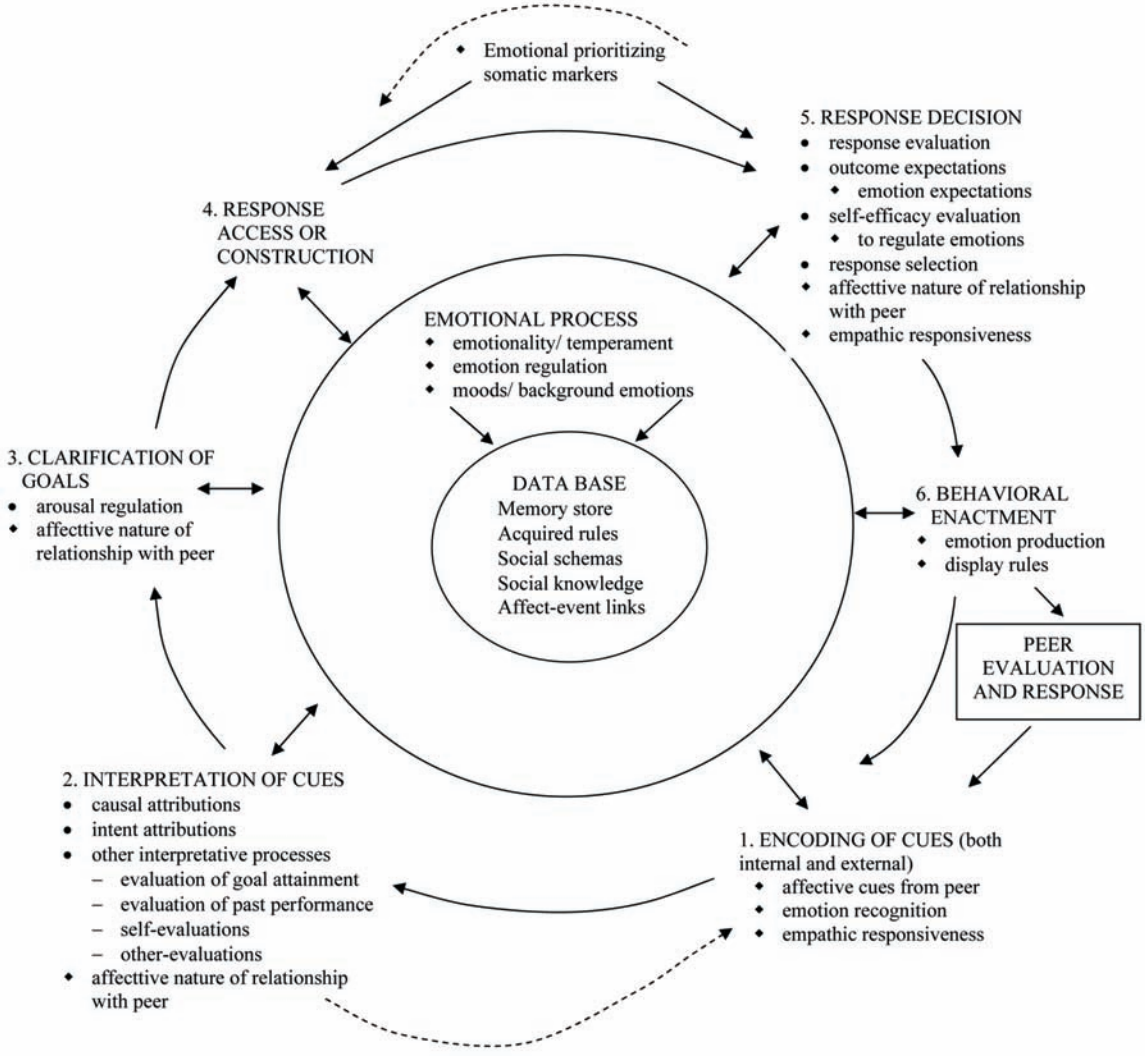


Figure 2. Arsenio and Lemerise's integrated model of emotion processes and cognition in social information processing. Items marked with filled circles or dashes are from Crick and Dodge's model; those marked with filled diamonds represent emotion processes added to the model. *Note.* From "An integrated model of emotion processes and cognition in social information processing", by E. A. Lemerise and W. F. Arsenio, 2000, *Child Development, 71*, p. 113. Copyright 2000 by the Society for Research in Child Development, Blackwell Publishing. Reprinted with permission.

The emotions expressed by other peers may influence the encoding and interpretation of social cues (*step 1 and 2* of SIP). The ability of recognizing emotions while encoding social cues is a determinant of the good processing of social information. Besides, children need to interpret peers' and their own emotional states, as they do with behaviors and external cues. Mood and the capacity of regulating emotions also influences the meaning children give to the situations and, therefore, the following steps. An unfriendly peer may elicit negative emotions, which are likely to produce wrong (hostile) attribution of intention. Similarly, an emotion such as anger may lead the angry child to view an accidental harm as perpetrated on purpose, or, vice versa, a hostile attribution of intent is likely to lead to anger (Crick & Dodge, 1994; Graham, Hudley & Williams, 1992; Hubbard et al., 2002). Bullies and victims have been found to respond with higher anger than their classmates to perceived provocation (Camodeca & Goossens, 2005), while antisocial boys seem to present biases in attributing emotions to peer provocateur, i.e., they thought more often than comparison boys that the provocateur was happy and that felt no guilt or shame in doing harm (Orobio de Castro, 2000).

High intensity of emotions and difficulty in regulating them may lead a child to choose goals (*step 3*) which are avoidant or aggressive in order to reduce the emotion arousal. Constructing, selecting and enacting a response (*steps 4, 5 and 6*) may be influenced again by intensity of emotions and control over them, and by the capacity to read and express emotions. Too strong emotions and the incapacity to cope with them may lead children to be too involved in the situation till the point to be unable in generating competent responses and to respond without thinking at possible alternatives (Di Norcia, 2006). Furthermore, as underlined by Lemerise and Arsenio (2000), the affective relationship with the involved peer is a strong determinant of goals and responses. Actually, children may be motivated by good social ties, such as friendship, to respond benevolently, because they want to avoid the negative emotional consequences derived from hurting a friend; they are interested in maintaining a good relationship.

An important emotion, which is supposed to influence almost each step of the SIP is (the lack of) empathy, as often underlined by Lemerise and Arsenio (2000). Empathy comes from the ability to perceive others' feelings and to react emotionally. Therefore, it is not enough to be able to understand a social situation, but it is also necessary to feel how the other feels, to be able to perceive the consequences that an act can have for the victim and to avoid causing harm.

It seems that a lack of empathy is a characteristic of bullies (Arsenio & Lemerise, 2001; Kaukiainen et al., 1999; Sutton et al., 1999), who inflict pain probably because they do not feel what the victim can experience. Probably as a consequence of this, bullies fail in feeling guilty for their acts, and often experience pride in front of their admiring peers (Menesini et al., 2003). Empathy is a sociomoral emotion and is supposed to be involved in the development of morality.

Morality

Recently, moral emotions have been integrated in social information processing, on the basis of the fact that when children perceive others, they not only use their cognition (original

SIP) and emotional cues (SIP as integrated by Lemerise & Arsenio, 2000), but also moral judgment (Arsenio & Lemerise, 2004).

Children perceive situations in which harm is provoked as morally connoted and express guilt if they are supposed to be the provocateurs. Guilt is usually accompanied by shame, which is a painful feeling, arising from failure or incompetence, which, together with guilt, prevent people to cause a moral harm to someone else. It has been found that bullies report to feel less guilty and less ashamed than their classmates, showing a moral disengagement in social relationships, low empathy and deficits in understanding moral values, which are usually considered to be the basis of social and competent interactions (Menesini et al., 2003; Menesini & Camodeca, 2005).

Therefore, it seems that not only bullies present biases in processing social information, but they are also low on moral behavior and probably present deficits in moral development. The correspondence between deficits in moral issues and in social information processing, together with a focus on emotional reactions, underlines once more the need of considering social cognitions together with emotions and moral issues.

One of the main contributions on morality and social information processing theory is once again by Arsenio and Lemerise (2004). After combining the social information processing framework with emotions, the authors also proposed a further integration in the model by adding morality in the original SIP. They advanced the hypothesis that both morality and the SIP model have to do with harmful behaviors (e.g. aggression), both "emphasize the vital connection between children's social cognition and their related behavior" (p. 987). To remain focused of the present work, we could surmise that social perception is the basis both for behavior and for morality, because they are both supposed to develop from judgments of intentions.

At this point, we can review the SIP model including also moral judgments, which contribute to underline differences among children. At *steps 1 and 2* children consider the type of event and decide whether it caused an intentional harm and is therefore sociomoral, or whether it does not involve morality and fairness. When children wonder "Does he/she mean to harm me?", they are interpreting the situation according to their own moral values. For example (examples are taken from Arsenio and Lemerise, 2004), in the case of a thirsty peer cutting the line to drink at the fountain, a child may resolve that this is "not fair", but the response will be determined by whether he/she attributes the act to a moral harm ("he wanted to be mean") or to a social conventional domain ("the rules of the school say we have to wait in line"). Similarly, if the child perceives the situation as benign ("that boy/girl was really very thirsty"), also the type of response he/she will produce will be different on the basis of whether the focus is on moral domain ("we should help people in need or trouble") or to social conventional domain ("exceptions to the rule are not morally wrong").

At *step 3*, children clarify their goals, which can be instrumental or relational, morally or not morally connoted (e.g. aimed at doing what is right and fair, although it may be difficult). Children who are low on morality and who prefer instrumental goals are more likely to choose an aggressive goal, and, therefore, an aggressive response. Step 3 is linked to *step 4*, generation of responses. To take again the example of the line cutting at the water fountain, Arsenio and Lemerise (2004, p. 997) "assume that the line waiter originally had the instrumental goal of getting a drink. When the other child cuts, additional goals may then be activated", such as showing power and dominance, or trying to remain friend with that peer, or avoiding embarrassment in front of the group. "For many children, focusing on both the

line-cutting classmate's unfairness to the self and the instrumental goal of getting the place may be sufficient to lead the generation, evaluation, and selection of a hostile or aggressive strategy such as pushing the classmate away from the water fountain" (Arsenio & Lemerise, 2004, p. 997). If the child will focus not only on the unfairness of the act of cutting the line, but on the possible consequences for the peer if he/she will respond with aggression, this moral view will lead the child to act in a more prosocial, competent way. Children with a low level of moral inhibitions tend to choose aggressive responses, aimed at ruining the relationships, which do not consider others' feeling, and which underline their incapacity of empathy (Di Norcia, 2006)

As already suggested, in *step 5* also Crick and Dodge (1994) had proposed that moral issues guide the evaluation of the response, in the sense that if children think that a certain response is "right", it is likely that they perform it. Again, children differ in what they consider "right" or "fair". Some authors (Cairns & Cairns, 1991; Sutton et al., 1999) claimed that the social incompetence of aggressive children and bullies would not lie in social deficits or in deviant perceptions, but in the moral values leading their behavior. Bullies can make socio-cognitive attributions and inferences in an unbiased way, but they give a different value to their (aggressive) acts. According to this view, perceptions of behaviors may be similar in aggressive and non-aggressive children; what is different is the value they attribute to them.

To conclude, children who present deficits in moral development accept aggression more easily and feel less empathy towards those who suffer. They neither have inhibitions preventing them from causing harm, nor do they feel ashamed or guilty for their wrong acts. Inner mechanisms who lead to moral disengagement make acceptable and "right" even antisocial behaviors (Di Norcia, 2006).

HOW DO CHILDREN PERCEIVE PEERS?

After explaining how children perceive others' intentions, social cues and social situations according to the social information processing theory, we now focus on how children perceive particular groups of peers. It seems important to understand the way in which social categories or social groups are seen by children, because such perceptions may guide children's behavior.

For the purpose of this chapter, we are going to examine the salient characteristics which make children at risk of maladjustment or which protect them and make them popular. We are going to consider the role of physical features, behaviors, personal reputation and responsibility in social perception. Which is the role of popularity in making judgments? Which particular characteristics make children vulnerable to peer victimization?

Popularity

Being accepted in a group is generally seen as a measure of social competence, it is linked to popularity, to positive self-concept, and to social and cognitive skills (Boivin, Hymel & Hodges, 2001). In this way, social acceptance can be considered as a reflection of how someone is perceived in the group.

A study by LaFontana and Cillessen (2002) showed that sociometric popularity (*liking*) and perceived popularity (*popularity*) are different constructs. With the former term, it is meant the result of sociometric choices, in which peers are nominated on a like-dislike continuum. Liked, popular, children are defined as those who receive many positive choices (e.g. "Who are the kids in your class you like *the most*?") and few negative choices (e.g. "Who are the kids in your class you like *the least*?"). On the other hand, perceived popularity is obtained by asking peers to name those classmates whom they think are popular or unpopular.

The two groups of sociometrically and perceived popular children differ in the way peers consider them. Peers who are personally liked are usually perceived with only positive characteristics (e.g. athletic and academic ability, prosocial behavior). On the other hand, children who are considered popular are perceived with a mixture of positive and negative traits. It seems that perceived popularity is mainly a matter of visible characteristics which have a large impact, such as social power, attractiveness, and social connectedness, but also dominance and aggression. Therefore, perceived popular peers are considered skilled and able to reach their goals, even if they have to use aggression in order to obtain them. Their counterparts, perceived unpopular peers, are seen as withdrawn and social isolates, considered unattractive and unable to connect with peers.

Especially in the case of perceived popularity (or unpopularity), we can surmise that personal reputation play an important role. Actually, the way in which children are perceived in the group increases or decreases one's own reputation in the peer group, in a vicious circle. Personal reputation influences the way in which each child is perceived by peers, and this perception, in its turn, contributes to the formation of reputation.

Victimization

Although there could be many reasons why children are victimized (which are beyond the scope of the present work), often it is the way in which they are perceived by their peers to contribute to their harassment. Particular characteristics (social, physical, or behavioral) are valued in a way which can make some children an easy target to victimization.

On a social level, peers who have many friends are perceived as popular and their reputation prevents them to be victimized. Being able to establish friendships is a skill which helps in becoming well integrated in the group, assertive and, consequently, less likely to be victimized. Consequently, not having friends is a strong correlate of victimization (Boivin et al., 2001; Hodges, Malone & Perry, 1997; Pellegrini, Bartini & Brooks, 1999; Schwartz, McFadyen-Ketchum, Dodge, Pettit & Bates, 1999). Friends have a protection and help function, can give victims advice on how to cope with harassment and threats and can teach them social skills.

Victims usually have low levels of peer acceptance, and are often excluded or rejected by their classmates (Boulton & Smith, 1994; Perry, Kusel & Perry, 1988), which make peers to feel legitimized to harass them. As underlined in the previous paragraph, personal reputation also has a role, and it is likely that once children are labeled as victims, and therefore, excluded from the group and marginalized, rejection and harassment become an etiquette which contributes to the establishing of their role.

Some authors claimed that visible deviations, such as red hair, wearing glasses, obesity, handicaps (e.g. defects in sight or speech) may be associated to victimization (Glover, Gough, Johnson & Cartwright, 2000; Lagerspetz, Björkqvist, Berts & King, 1982). Sometimes even more trivial features, such as wearing the wrong make of clothes, can be sufficient reason for being bullied (Junger-Tas & van Kesteren, 1999). We can surmise that children with particular physical characteristics are perceived by their peers as less worthy of attention, are likely to be rejected and even to be harassed. However, it is necessary to consider that physical characteristics are not all the same and depend on the personal responsibility peers attribute to those children owning them.

Perception of responsibility seems to be an important variable to take into account in order to understand children's behavior. There is evidence that people tend to judge the behavior of others on the basis of perceived responsibility (Graham & Juvonen, 1998, 2001; Weiner, 1995). Therefore, also children are (or are not) held responsible for their behavior on the basis of whether (or not) they could control it.

A study was conducted to uncover whether being held responsible of certain behaviors or features led to victimization (Camodeca & Goossens, 2004). We divided risk factors for victimization into those factors for which one can not be held responsible, and those that do depend on children's responsibility. Characteristics such as wearing glasses, having braces or red hair, suffering from infirmity, hearing or teeth or speech problems, belonged to the first group. Risk factors supposing responsibility included characteristics such as wearing funny clothes or having a striking appearance, acting childishly, being obese. According to the hypotheses and to the attributional approach (Graham & Juvonen, 2001), we did find that children blame (and victimize) those who can control and are responsible for their behaviors or characteristics, while factors which are considered beyond one's own responsibility were not associated to victimization.

As claimed by Schuster (2001), the peer group has a negative social perception of victimized and rejected children who are seen as responsible of their own failures and plights. These attributions lead peers not only to feel less pity for their classmates, but even to reinforce the negative evaluation and the consequent harassment toward them.

CONCLUSION

In this chapter we focused on the role of social perception on behavior, taking into account how children perceive social situations, others' intentions, peers' characteristics, reputation and responsibility, which determine the way in which children interact with each others.

We have seen that the way in which children perceive their peers (e.g. popular, responsible of their characteristics) and others' intentions (e.g. attributing hostile/benign intents) is determinant for the development of social competence and social adjustment, or, on the other hand, for the development of aggression, victimization and maladjustment.

The social information processing theory seems to be particularly appropriate to uncover the way in which children perceive social cues and others' behaviors and respond consequently. Similarly, adding the role of emotion and morality broadened the field of application of the SIP model and made it even more accurate.

We can conclude that social perception is not an automatic or simply biological action. It is important to consider that children are actively involved in selecting the focus of their perception and the meaning to give to behaviors, in attributing intentions, in understanding emotions and values, in thinking about their own and others' personal responsibility. Final behaviors and interactions among children depend on this active work.

Children's (and adults') social world is therefore built on a broad system of perceptions, attributions, cognitions, emotions, beliefs, characteristics which belong to the perceiver and the perceived, the situation, the context and the specific interaction. We tried to make it clear that it is the personal way of seeing the world that makes it nice or bad, harsh or lovely; it is the way we are seen that makes us happy or sad, popular or rejected.

Because social perception has a role in the development of aggression and victimization, we think that particular attention should be given to the social and personal consequences of maladjustment and to the way in which children can be helped.

Interesting implications for intervention may be suggested to be carried on in the schools, which are the special places where children spend a lot of time together and which promote interactions and socialization. As for the biases in perception of others' intentions, for instance, programs may be developed to train children to detect intentionality accurately, to attribute non-hostile intents in ambiguous situations (e.g., by means of role-playing or simulations), to behave as if the ambiguous acts were an accident, in case of missing information, and to ask for more information before blaming someone, because even if a harm is brought against them, the other person may not have done it on purpose.

Teaching children that peers' physical characteristics do not mirror how a peer really is, but are only exterior features, may help in perceiving peers in an unbiased way and in reducing victimization. Similarly, it may be important to develop programs specifically aimed at victimized and rejected children in order to promote assertiveness and interaction skills, which can be useful to children to avoid a bad reputation and to be perceived in a nice way.

Finally, we had talked about the importance of moral values and emotions in guiding children's perceptions and behaviors. We think that intervention programs can be designed in order to educate children to regulate, express and control emotion and to develop empathy, which is central in guiding prosocial behavior. Group activities, discussions, role playing activities, interactive games can all be useful for the purpose. As for the development of morality, we think it is extremely important to guide children in their judgment of what is fair and what is not, what is socially and morally accepted, which may be the consequences of a moral disengagement, or why feeling responsible matters. We strongly urge that theoretical and applied research is carried out to develop and improve intervention models focusing on a moral values based education.

As this chapter had showed, to understand children's development and to act consequently in order to help them, it is important to have a broader view in which social perception, cognition and emotion all have a role and interact with each other.

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Chapter 5

WHAT CAN SOCIAL PSYCHOLOGY GAIN FROM AND OFFER TO CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT: SOCIAL PERCEPTION OF THE SELF AND OTHERS

Klara Marton[1,2*] and Meredyth Wellerstein[1]
[1]Department of Speech Communication Arts & Sciences,
Brooklyn College, City University of New York, USA
[2]Barczi Gusztav Faculty of Special Education, Eotvos Lorand University, Budapest, Hungary

ABSTRACT

This chapter includes studies that examine various aspects of social perception and communication in a special population, children with specific language impairment (SLI). The data obtained from this population help us to study the dynamic nature of and the interrelationships within social cognition and communication. Based on observations, interviews, and experiments with children with SLI, their peers, parents, and teachers, we offer a new theoretical hypothesis of social cognition. The "serial circuit" hypothesis proposed in the present chapter helps us to interpret the relationship between a wide range of social-cognitive functions, such as social perception and self-esteem. According to this hypothesis, the various factors of social cognition and communication function similarly to a serial electric circuit with many light bulbs. Light is sparkled by these bulbs only if the circuit is complete. If you unscrew any of the bulbs, the system shuts down. Typically, the different functions of social cognition and communication are intertwined in a manner that results in a complete system. The findings in children with SLI help us to better understand these relationships by showing us the consequences of any dysfunction within the system. This chapter includes data on

* Correspondence: Klara Marton, Address: Brooklyn College, 2900 Bedford Ave., Brooklyn, NY 11210, Phone: (718) 951-5186, Fax: (718) 951-4167, Email: kmarton@brooklyn.cuny.edu

self-perception, the perception of others –parents and teachers-, mimicry, consistencies in behavior, executive functions –attention switching, emotion control, inhibition, perspective taking-, and social-pragmatic problem solving in children with SLI. Beyond the theoretical merit of the present findings, the data have relevant clinical implications for professionals working with populations that show difficulties in social interaction.

INTRODUCTION

This chapter focuses on various questions of social perception and other social cognitive phenomena from a unique perspective. We analyze the relationship between self-perception and the perception of others through data from a special population: children with specific language impairment (SLI). These data enable us to examine how different aspects of social cognition and communication affect each other.

Our perception of who we are is highly influenced by factors, such as our memory, social cognition, and the reactions of others. Past experience affects recent behavior even if those influential events are not consciously remembered anymore (Greenwald & Banaji, 1995). The way we think about ourselves, our self-cognition has a great impact on behavior regulation and mediates significant intra- and interpersonal processes - social perception, social information processing, affect, motivation, choice of partner and strategy, and reaction to partners' feedback (Markus & Wurf, 1987). Our self-cognition determines how we communicate, interact with other people in different social situations. There is no comprehensive model that would adequately address the interrelationship among communication, language, cognition, social-cognition, and behavior (Cohen, Menna, Vallance, Barwick, Im, and Horodezky, 1998, Farmer, 2000). Although it would be too ambitious to claim the presentation of such a model in this chapter, we do introduce a theoretical hypothesis that represents the interrelationship among factors of social cognition and communication.

The data we are going to present in this chapter are findings from various social-cognitive tasks in children with specific language impairment. These data suggest that the different elements of social cognition and communication are not only interrelated, but they function in a circular and reciprocal relationship. Previous social psychological studies have shown many pair-wise relationships between self-perception, other's perception and behavior. The findings indicate strong relations between mimicry and liking of the interactional partners (Bargh, 1999), between shared opinions and mimicry, the effects of synchrony in body movements on empathy (Niedenthal, Barsalou, Winkielman, Gruber, and Ric, 2005), how liking affects cognitive performance (Dijksterhuis & Bargh, 2001), the effects of exclusion on self-perception (Pickett, Gardner, and Knowles, 2004), and the way social attraction can be enhanced by increased sharing of opinions, ideas, and thoughts (Greenwald & Banaji, 1995).

The theoretical hypothesis we propose in this chapter is analog to a serial electric circuit: if there is a shortage at any given point, the whole system may break down. Based on our findings, we describe the relationship among these various aspects of social cognition and communication similar to a serial electric circuit with many light bulbs. They all sparkle light if the circuit is complete. However, if you break the circuit at any point, e.g., if you unscrew a bulb, the entire system shuts down and there will be no light until each bulb functions appropriately again. The issues in social cognition and communication show such a strong

interrelationship that the various elements affect each other as the light bulbs in the serial electric circuit. We will demonstrate in the present study that children with SLI, as a group, perform more poorly in every target area than their typically developing peers. These children show weaknesses in numerous aspects of social cognition including social perception and self-esteem. The data from children with SLI also reflect many inconsistencies, mismatches, and individual variations in most aspects of social cognition. These findings may be surprising at first glance because, by definition, children with SLI have no major difficulty in interpersonal relationships. Furthermore, a number of the tasks we used targeted behaviors that are automatic already in infancy and reflect innate skills, such as imitation of others' behavior (Meltzoff and Moore, 1977) or reception of subjective states of others – natural sociability (Trevarthen and Aitken, 2001). The proposed theoretical hypothesis that social cognition functions as a "serial circuit" is based on data that we collected from children with SLI, from their parents, and from their teachers with regards to the above factors.

As mentioned above, by definition, children with SLI show normal interaction with people and objects and they show no signs of pervasive developmental disorders, such as autism. These children have, however, significant limitations in language abilities in the absence of hearing impairment or any neurological damage. Their language scores on standardized tests are at least 1.25 SD lower than the average (<81 IQ) and/or their language-age is at least 12 months below their chronological age. These children's non-verbal intelligence is within the normal range (Leonard, 1998).

In the following parts of this chapter, we offer insights into the reciprocal, interdependent relations of social cognition and communication through systematic analyses of these skills in this special population that on the surface seems to function socially fine, but in reality shows an inappropriately working social system. If we look beyond the label, data from children with SLI support the theoretical hypothesis of a "serial circuit" representing the relationship among various elements of social cognition and communication. These children, as a group, show a deficit in numerous social-cognitive, verbal-, and non-verbal communication skills. Their overall social problems –the lack of peer relationships, poor negotiation and conflict resolution skills, loneliness, social isolation- are very similar, but the underlying deficits show a wide range of mechanisms. There are numerous individual variations, but all of them result in similar interpersonal difficulties.

SOCIAL COGNITION AND COMMUNICATION

The first area that we are going to examine in this chapter is the interaction between social perception and behavior. In social situations, individuals often do what they see from others because the perceptual inputs are transferred into behavioral outputs automatically (Dijksterhuis & Bargh, 2001). The perception of someone's behavior increases the likelihood of similar performance in the perceiver (Chartrand & Bargh, 1999). Social interactions include various types of verbal and nonverbal behaviors; the following ones have particular relevance in forming friendships, rapport, and other social relations. There is a direct, automatic effect of perception on behavior in imitation of facial expressions, gestures and body movements, and certain speech-language characteristics (Dijksterhuis & Bargh, 2001). The process of establishing behavioral synchrony does not require an already existing

relationship or any goal of affiliation with the other person on the perceiver's side (Chartrand & Bargh, 1999).

The imitation of facial expressions has a strong effect on the partner's emotions. The more intensively conversants imitate each other, the more shared emotions they develop. This mirroring behavior leads to a stronger bond between partners (Dijksterhuis & Bargh, 2001). In addition to imitation of facial expressions, body postures are also spontaneously mirrored during interaction (Bernieri, 1988). The imitation of facial expressions and body movements increases liking between the partners. If individuals experience that their postures and movements are mirrored by a partner, they will like their partner more. As a consequence, their interaction will go more smoothly than with someone who does not mirror their behavior (Chartrand & Bargh, 1999). Liking serves as a moderator that increases the perception – behavior relation. Further, it leads to stronger perceptual effects and increases attention to the other person (Dijksterhuis & Bargh, 2001).

Synchrony in body movements facilitates cooperation and empathy. In turn, if liking is enhanced, the partners will increase their mimicry. Mirror neuron circuits in the brain facilitate social learning, empathy, and social cooperation (Niedenthal et al., 2005). Although imitation of observable behaviors is based on an innate, automatic route between perception and action (Dijksterhuis & Bargh, 2001), there are circumstances when imitation is inhibited or moderated. Peoples' flexibility enables them to override direct effects of perception on behavior. This occurs in situations where the individual perceives the other person's behavior as dangerous or if there are high costs associated with the perceived behavior based on one's prior experience (Dijksterhuis & Bargh, 2001). If there is asynchrony in body movements and if matching the partner's facial expression and gestures fails, the interaction will be less harmonized and it will lack empathy and cooperation. The observation that people are able to override their automatic imitative behaviors is in harmony with the results on flexible working memory processes. Task goals can override automatically suggested responses. This behavior is targeted in various forms of the Stroop test (Fazio, Sanbonmatsu, Powell, and Kardes, 1986). We will present our findings on the Stroop Color and Word Test (Golden, Freshwater, and Golden, 2003) in children with SLI in the section on executive functions below.

Conversational partners may override their automatic mimicry if they find the child with SLI "strange". Many children with SLI show a weakness in mirroring the partner's body postures. As mentioned above, mimicry leads to increased liking of partners (Bargh, 1999). SLI children's peers are used to these typical interactions where the partners mirror each other's body movements and postures. When they interact with children with SLI this automatic mimicry is either absent or limited. This may cause a stoppage in the flow of typical interaction. This altered interaction may result in decreased liking of each other. In a typical social situation, liking leads to stronger perceptual effects and increases attention to the other person (Dijksterhuis & Bargh, 2001). If liking is decreased by the failure of mimicry on the SLI child's side, it will prevent the partners from developing stronger attention toward each other and will decrease the likelihood of developing bonds.

Our findings show that children with SLI have a weakness in postural imitation. In an experiment involving 40 kindergarten children with SLI and 40 age-matched peers with typical language development (TLD), children with SLI performed more poorly than their peers on tasks that required the imitation of hand movements and body postures (Marton, under revision). The Imitation of Postures and the Bilateral Motor Coordination tasks (Ayres,

1979, 1988) required that participants carefully observe the examiner's behavior and copy the exact movements and postures. Performance on these tasks is highly influenced by the individual's perception of his own body. When children imitate another person's body postures and movements they perceive their own body scheme, access their own body image, and retrieve related spatial and kinesthetic memories. Body experience refers to the context in which an individual perceives his own "body world" (Weber, Bronner, Their, Schoeneich, Walter, and Klapp, 2001). Body image and experience are central aspects of quality of life.

Children with SLI showed difficulties in coordinating their own body movements and postures. These children did either perceive the examiner's postures in a more holistic form without paying attention to certain details, e.g., how the hands rested on the knees or focused on particular details, but missed the overall posture. They also showed a deficit in analyzing the model while simultaneously monitoring their own mirroring behavior. Our results indicate that children with SLI have a weakness in monitoring their own behavior. Planning and monitoring is part of executive functions. Our findings on executive functions in children with SLI and their impact on these children's social behavior will be discussed in a separate section below.

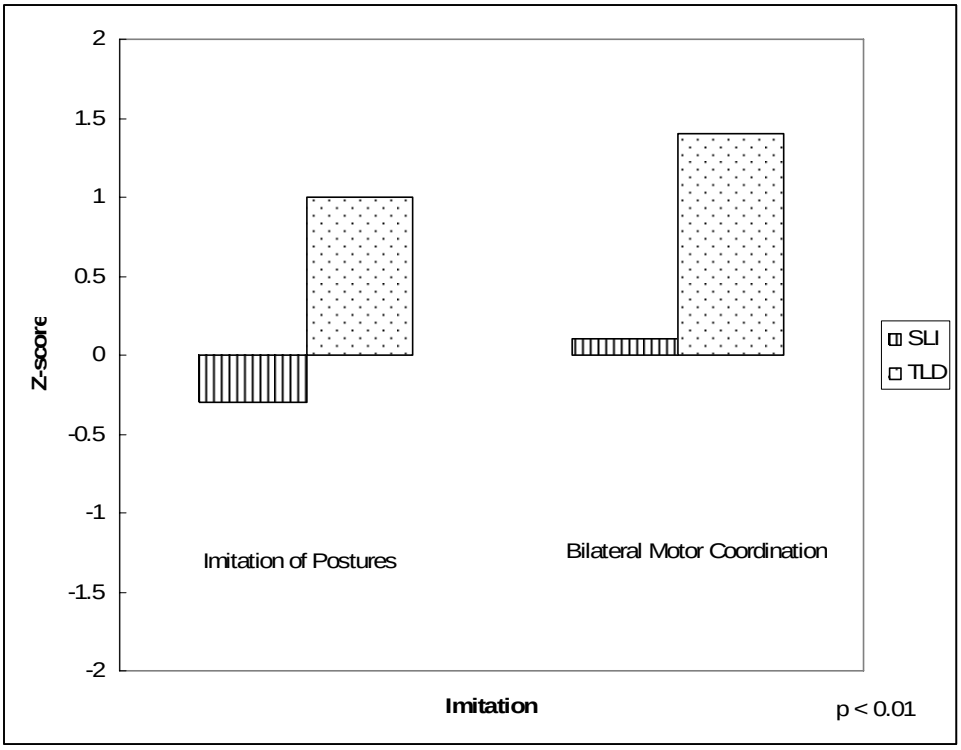

Figure 1. Imitation of body postures and hand movements in children with SLI and TLD.

The difficulties that children with SLI experienced in matching the experimenter's behavior were closely related to problems in dividing their attention between self-focus and perception of others. Self-focused attention has an overruling effect on perception of the partner's behavior; it inhibits behavioral matching (Dijksterhuis & Bargh, 2001). Typically,

one switches his attention from the self to the other person numerous times during the interaction. Effective mirroring requires that the partners continuously redirect their attention. Attention switching is also part of executive functions and will be discussed in more details below.

The problems that children with SLI experience in imitating their peers' behavior have a reciprocal effect on the social acts of the typically developing children: it decreases their mimicry. This less effective mirroring behavior results in less liking in both parties. Typically developing children often find their language impaired classmates "weird". On the other hand, the lack of smoothness in social interaction makes children with SLI feel less confident with their age-matched peers. Consequently, children with SLI prefer to interact with younger children and adults. This was evidenced in these children' answers to statements in the Culture-free self-esteem inventories (Battle, 1992). Unlike typically developing children, participants with SLI preferred to choose a playmate that was significantly younger than them (Marton, Abramoff, & Rosenzweig, 2005).

The mirroring behavior of children with SLI is further limited by their difficulty in perspective taking. Individuals that are good at perspective taking mimic their partner's body posture, voice, and facial expression to a much greater extent than those who show a weakness in this skill (Chartrand & Bargh, 1999). In relation to their deficit in perspective taking, children with SLI exhibited less mature social strategies than their peers. These children showed particular deficits in evaluating strategies to resolve a conflict and in identifying the feelings of different individuals involved in the conflict. Social problem solving is highly demanding on executive functions. In a social situation, children need to analyze the social context, set goals, evaluate alternative strategies to find the most appropriate ones, and anticipate possible outcomes. This process requires simultaneous coordination of skills, abilities, and activities. A weakness in simultaneous processing inhibits social problem solving in children with SLI. We will discuss further details on perspective taking in the section on executive functions.

In addition to the above more complex processes, social relationships are strongly influenced by some simpler social pragmatic skills, such as gesture use and eye contact. Gesture use is a universal phenomenon that has been observed in every culture, age-group, and task. Gestures are conventional forms of communication that either accompany or substitute oral language use (Goldin-Meadow, 1999). The difficulties children with SLI experience in peer relationships are further enhanced by their weakness in these functions. In a questionnaire that we distributed to 19 parents of children with SLI and to 19 parents of age-matched typically developing peers, the parents of children with SLI reported significantly more problems in their children's gesture use and eye contact than the parents of children with TLD. The target gestures in this case were the ones that accompany speech in conversations. These gestures reflect a person's feelings and attitudes. They are core elements of an individual's mirroring behavior.

Most children with SLI used fewer and less conventional gestures than their peers. Some of these gestures showed a mismatch with the social context. Conversational partners found a number of these gestures awkward and inappropriate. The unconventional use of gestures and their lower frequency in children with SLI were often confusing for the partners and decreased the smoothness of social interaction. The problems with eye contact in children with SLI are not as severe as in children with autism, but they influence the partners' perception of these children. In social situations, children with SLI showed less consistent eye

contact than their typically developing peers. This seemed to disturb their interactional partners. The combination of unusual gesture use and less frequent eye contact had a negative effect on social interaction. This atypical behavior in children with SLI may -in part- result from their lack of self-confidence in social situations. The interaction among these social factors provides a good example for how the proposed "serial circuit" hypothesis works in social interactions. If children use fewer eye contacts and make more awkward gestures because of their low self-confidence in social situations, then these unusual behaviors will have a negative effect on their partners' perception. This in turn, will have an impact on the partners' behavior, e.g., they will decrease imitation. This decreased mimicry will result in less liking that will further decrease the SLI child's self-confidence.

Imitation is not limited to a person's non-verbal behavior, mirroring is reflected in the use of numerous linguistic and supra-linguistic features, such as imitation of the partner's syntactic structures, tone of voice, and prosodic features. Conversational partners imitate and match each other's sentence structures (Bock, 1989); synchronize their latency and rate of speech, and the duration of their utterances (Niedenthal, et al., 2005; Neumann & Strack, 2000). Because of the nature of SLI, these children's core deficit lies in the use of linguistic and supra-linguistic strategies. Children with SLI have difficulties perceiving and processing fast and rapidly changing auditory stimuli, such as elements of an ongoing conversation (Benasich and Tallal, 2000). These children use simple sentence structures and make errors with inflectional morphemes, e.g., they tend to omit inflections, such as third person "s" in obligatory contexts (van der Lelly and Stollwerck, 1997). Thus, children with SLI show difficulties not only in mirroring their partner's non-verbal behavior -as discussed above- but also in synchronizing their speech rate with and matching their sentence structures to the ones used by their conversational partners. The findings presented so far show that children with SLI have difficulties in each relevant function that affects the formation of partnerships. We hypothesize that the functions that reflected an impairment in these children are not isolated, so the observed deficits are the results of reciprocal interactions among these functions.

SELF-PERCEPTION AND THE PERCEPTION OF OTHERS

Self-cognition affects behavior regulation and mediates significant intra- and interpersonal processes, such as social perception, social information processing, affect, motivation, choice of partner and strategy, and reaction to partners' feedback. An individual's self-concept is closely related to self-enhancement, consistency, and self-actualization (Markus & Wurf, 1987). Persons' self-representations are not limited in time and form: they may relate to the present, to the past or the future, and may assume various forms, such as verbal and non-verbal representations. Self-esteem reflects the interrelationship between our own perception of the relations of the self to others and the evaluation of others. If individuals associate themselves with positively valued other people or dissociate themselves from negatively valued others, then their self-esteem will be high (Greenwald & Banaji, 1995).

Several models of self-perception and self-esteem exist in the literature. Most of them focus on the relationship between self-perception and social-cognitive performance and behavior. Children, who experience social and/or cognitive success and receive positive feedback, develop positive self-perception and self-esteem. Children, who experience failure

socially or cognitively, develop negative self-perception and self-esteem. Positive self-perception enhances self-confidence that helps to cope even with negative experiences. Children with higher self-perception are more efficient in developing goals, monitoring their behavior and regulating themselves (Chen, He, & Li, 2004). Positive self-esteem helps children to adjust to the social-cognitive demands of interpersonal and group situations (Jerome, Fujiki, Brinton, and James, 2002). Self-perception and performance show a reciprocal relationship. Positive self-perception is also highly correlated with an individual's overall happiness (Baumeister, Campbell, Krueger & Vohs, 2003).

Self-perception and self-esteem are affected by the individual's own thoughts and feelings and by the behaviors of others (Markus & Wurf, 1987). Thus, children who are accepted and liked by their peers are most likely developing positive self-esteem. Children who are rejected by their peers or underestimate their social status develop lower self-esteem and often show symptoms of depression. High self-perception of one's own social standing may prevent the individual from developing depression or other internalizing problems (Pardini, Barry, Barth, Lochman, & Wells, 2006). Being excluded or rejected from a social group has pervasive negative effects on one's self-esteem (Sommer, Williams, Ciarocco, and Baumeister, 2001). Children with SLI often experience social rejection from their peers. Their social isolation may begin as early as preschool (Gertner, Rice, and Hadley, 1994). These children's social behavior is influenced by these past experiences even if the current situation differs from the previous ones. These earlier memories have a high impact on their actions. These children do not have to be aware of these negative experiences, their social choices and behavior will be influenced by them through implicit social cognition (Greenwald & Banaji, 1995).

Our present findings show that many children with SLI have low self-esteem, particularly with regards to their overall social competence, assertiveness, and socialization. The results on the Culture-free self-esteem inventories (Battle, 1992) show that these children feel lonely, isolated, without an adequate social network. They would like to have more friends and they wish to be chosen as leaders in their social groups.

Children with SLI, similar to children with learning disabilities, encounter many difficulties in social cognition, such as a weakness in simultaneously perceiving social cues and processing social and emotional information (Cohen et al., 1998; Stevens and Bliss, 1995). These children show a deficit in matching verbal cues to emotions and exhibit social problem solving difficulties. Although children with SLI listed as many social strategies as their typically developing peers, they were not able to apply these strategies in various social contexts (Cohen et al., 1998). The application of these strategies required perspective taking, attention switching, and monitoring. These executive functions are often impaired in children with SLI (see more details below).

Our recent findings reveal that most children with SLI showed not only lower social self-esteem than their age-matched peers based on scores on the Culture-free self-esteem inventories (Battle, 1992), but also gave more inconsistent answers. We analyzed the answers from 38 children with and without SLI. The participants in the latter group gave more consistent answers to statements that targeted specific social issues than the children in the former group. Most of these social statements focused on peer relationships, friendships, and children's social status in group situations. The SLI children's inconsistent answers may reflect a conflict between their perceived social status and the ones they wished to have (e.g., to be chosen as a leader, to have many same-age friends, etc.). These children may experience

a conflict between their actual self-representation and the self they would like to be. If there is a discrepancy between self-concepts that are about the actual self or the self would like to be, this conflict results in discomforts, anxiety, and depression (Markus & Wurf, 1987). Many of the SLI participants in this study reported frequent discomforts.

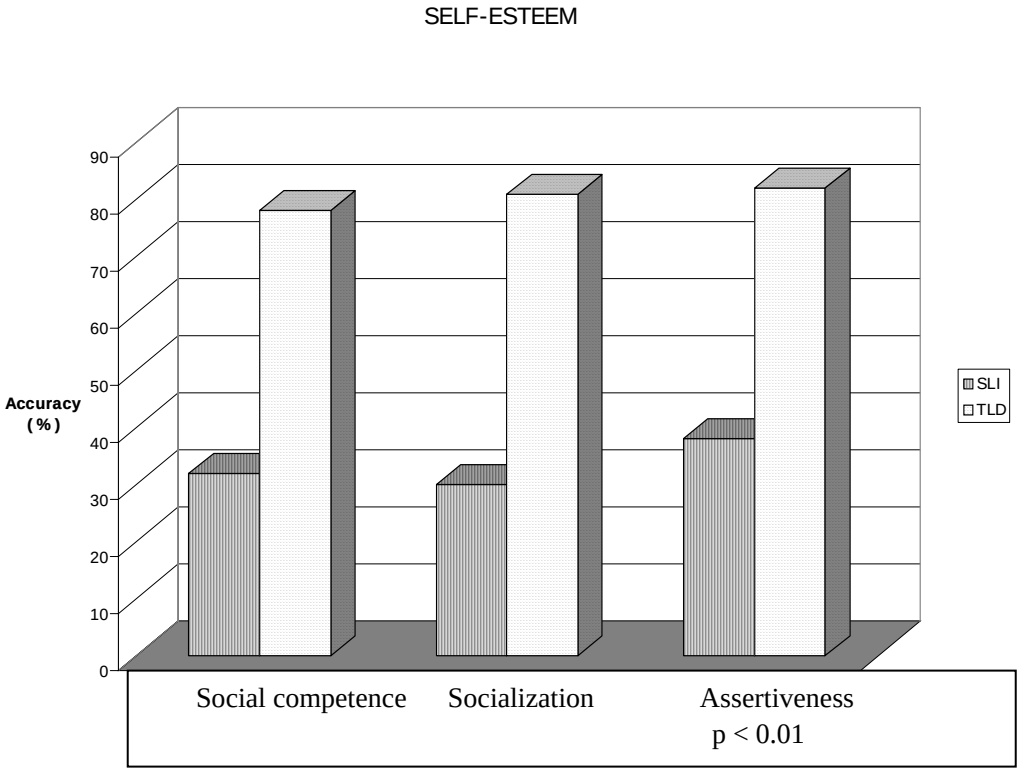

Figure 2. Social self-esteem in children with SLI and TLD.

There was a smaller group of children with SLI whose social self-esteem was high, comparable to the typically developing children. This result, however, was in conflict with their parents' reports. The parents of these children reported the lack of age-appropriate friends and loneliness in their children. One possible explanation of this conflict might be that these children used a strategy of derogation of their peers that excluded them from the social group. Rejection by others leads to derogation of the rejecters (Bourgeois & Leary, 2001). Derogation of the others helps to increase one's social self-esteem. Alternatively, some children with SLI may have viewed other children with similar difficulties as targets of discrimination and may not have seen themselves as victims. Self-positivity and self-enhancement may have prevented these children from developing negative self-esteem. Members of disadvantaged groups often apply this strategy. They view their peers within the same group as targets of discrimination and do not see themselves as victims because of self-positivity in their judgments (Greenwald & Banaji, 1995).

Somewhat surprisingly, it was not only the children with SLI who showed inconsistency in their self-evaluations. In the present study, parents of children with SLI also showed

inconsistencies in the ratings of their children's social relationships. The answers of the parents of children with SLI were more inconsistent than the answers of the parents of children with TLD. The SLI children's parents made comments that reflected their inner struggles, frustration, and confusion. Many of these parents expressed feelings of helplessness and a lack of strategies to cope with their children's problems. They also reported a need for counseling. Although all of the participants with SLI have been in speech-language therapy for many years, their language improvement showed little carry-over/transfer to their everyday social relationships and their academic performance. These children's therapy focused mainly on the improvement of their linguistic skills (i.e. vocabulary, morphology, and syntactic structures). Thus, therapy enhanced the content and the structure of these children's language; it had little or no impact on its social use. The many pragmatic difficulties that children with SLI faced in social situations were not secondary consequences of their language impairment. In a social problem solving experiment that involved hypothetical scenarios, children with SLI scored much higher on linguistic than on social-pragmatic measures (Marton et al., 2005). The social-cognitive problems arose concurrently with the language issues. This idea is supported by findings form other authors; e.g., the severity of language impairment does not correlate with children's withdrawal, solitary-passive behavior, and reticent behavior (Hart, Fujiki, Brinton, and Hart, 2004).

A further analysis of SLI children's social behavior revealed conflicts between the children's self-perception and the perception of their parents and teachers regarding these children's social activities and social status. Moreover, the parents and the teachers also showed disagreements in their perceptions of these children. In overall, the children were satisfied with their academic performance, but complained about their social relationships. They were concerned with their social status in the classroom and in other peer-groups. The parents perceived their SLI children as having difficulty in every target area including social relations, academic performance, and communication abilities. These parents judged their children more negatively than did the parents of the typically developing children. On the other hand, the teachers of the children with SLI did not perceive their pupils' social isolation or loneliness. They were only concerned with these children's academic performance (reading, writing, etc.). The teachers did not notice how much these children struggled in building peer relationships. There was a clear disagreement in priorities across children, parents, and teachers in the SLI group. In contrast, the perceptions of the parents and teachers of the typically developing children were more consistent and did not show a conflict with each other. Parents' and teachers' evaluations of the typically developing children were also in agreement with these children's self-perception regarding their social behavior and academic performance.

It is well-known that people tend to associate positive personality characteristics with other positive features without experiencing the latter ones (known as the Halo effect; Thorndike, 1920). The difficulties that children with SLI experience in their interpersonal relationships is the result of an interaction between their weaknesses in social cognition and communication and the perception and social behavior of their peers and others. There seems to be a negative Halo effect toward the children with SLI at work. These children's peers and other individuals may associate SLI children's language difficulties with more general negative social, cognitive, and behavioral characteristics (e.g., they do not know how to play with others; they often get into trouble, etc.). These negative attitudes lead to faster social rejection of these children. There are numerous clinical implications related to these

problems. We will present our suggestions for clinical application in a separate section following the discussion of executive functions.

EXECUTIVE FUNCTIONS AND SOCIAL BEHAVIOR

Many of the above social issues are closely related to executive functions. Executive functions is an umbrella term that has been used with various meanings in the literature. The term refers to task switching abilities (Towse, Hitsch, and Hutton, 1998), controlled attention (Barrouillet and Camos, 2001), the inhibition of irrelevant information (Hasher and Zacks, 1988), simultaneous processing of information (Engle, 2002), the avoidance of distraction (Miyake, 2001), developing goals, holding these goals in active memory, and monitoring performance to achieve goals (Stuss, 1992). One crucial aspect of executive functions is the ability to attend selectively to a stimulus and to inhibit the distraction of other stimuli (Baddeley, 1996). When individuals engage in a social situation, they focus on their conversational partner and suppress all other irrelevant information, such as outside noise, people talking in the hallway, or feeling hunger. Executive functions also refer to inner drive motivated adaptive behaviors and enable people to respond to new and challenging tasks (Martin & McDonald, 2003). Adaptive behaviors require both stable maintenance of goals and flexible switching.

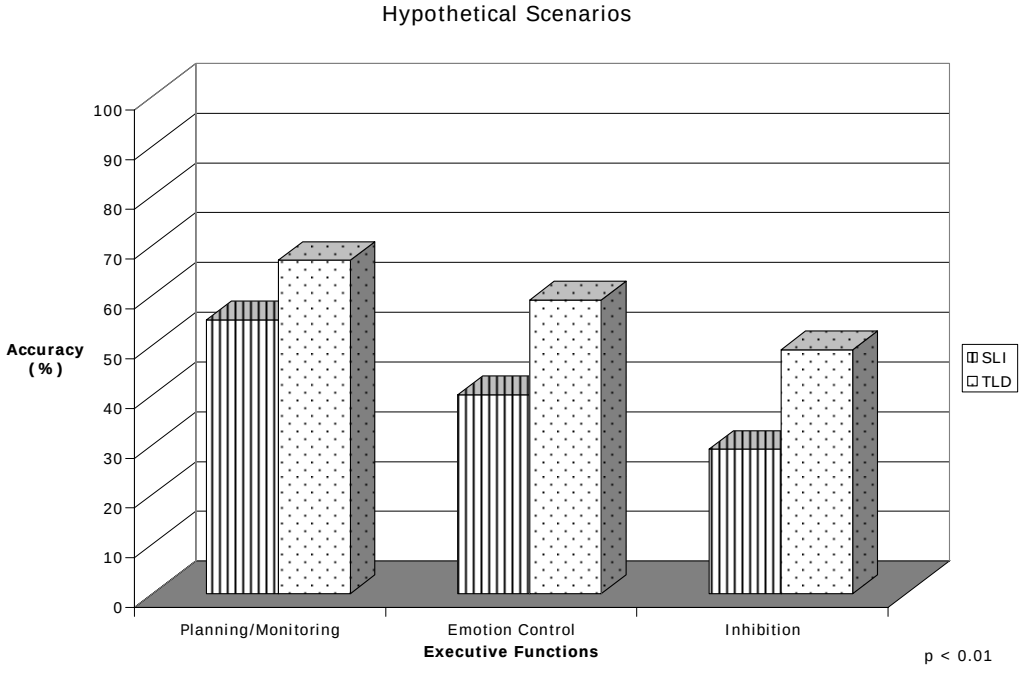

Figure 3. Executive functions: Behavior monitoring, emotion control, and inhibition in children with SLI and TLD.

In the present study, we analyzed children's answers in a social problem solving experiment that involved hypothetical scenarios of everyday social interactions. Children with SLI showed a deficit in a number of executive functions: planning and monitoring their own behavior, inhibiting inappropriate responses, and emotion control. These children showed difficulty in "keeping an eye" on their own activities while focusing on their partner's behavior. They were not able to simultaneously monitor their own body postures, movements, gestures, and speech acts and match the partner's behavior. This process requires the redirection of attentional focus from the self to the other and vice versa.

As a result of our observations and analyses of attention switching in social situations, we decided to compare attention switching in children with SLI and their age-matched peers on standardized tests. We tested attention switching in 25 children with SLI and 25 age-matched peers on the Children's Color Trails Test (Llorente, Williams, Satz, and D'Elia, 2003) and on the Wisconsin Card Sorting Test-64 (Kongs, Thompson, Iverson, and Heaton, 2000). Although these tests are complex in nature and provide global scores that reflect various executive functions, they are highly demanding on attention switching. Children with SLI exhibited a weakness in flexible attention switching in both tests compared to their peers. They showed difficulty in switching from one sorting principle to another when the conditions changed in the Wisconsin Card Sorting Test. These children needed more time to complete the Children's Color Trails Test because of the higher number of errors they had to correct. In this latter task the dependent measure is the total time used to complete the trail including the time that children need to correct their errors. Most of the errors produced by the children with SLI were perseverations in both tests. In contrast, children with TLD showed flexible attention switching as the task requirements changed (Marton, in press).

In social interactions, the failure in switching attention often resulted in self-focus and in the lack of perspective taking. Children with SLI made remarks that clearly reflected their inability to recognize the perspective and needs of their partners. The following example demonstrates this problem in the experiment where hypothetical scenarios were used to test children's social pragmatic skills (Marton et al., 2005). Examiner: "A younger child draws a picture for you that you do not like. What do you say?" Typical answers from the children with TLD included "You say, thank you. That's really nice of you. Then you put the picture in a drawer if you don't like it." In contrast, children with SLI would tell their partner "Don't do that again." or "You need to learn how to draw better.". These answers show that the children with SLI were not able to switch from their own perspective to the other person's perspective. If we asked these children directly whether such an answer was appropriate in a similar situation, they knew that it was not. However, when they had to apply this knowledge, they often failed.

A number of these children also showed a weakness in analyzing the social situation and in setting goals if a conflict occurred. In numerous cases, these children did not even recognize whether a conflict was already resolved. They showed a weakness in negotiating with peers because of their lack in perspective taking. This finding corroborates with results from previous studies where children with SLI used fewer conflict resolution and negotiation strategies than typically developing children (Brinton, Fujiki, and McKee, 1998; Stevens and Bliss, 1995).

Although behavior imitation is typically automatic, SLI children's peers may suppress their spontaneous mimicry if they notice that their SLI partner produces unusual behaviors. The question is whether children with SLI are also able to override their behavior if they face

dangerous social situations. Fazio and colleagues (1986) suggested using the Stroop test to examine this question. We tested 25 children with SLI and 25 age-matched peers with the Stroop Color and Word Test: Children's version (Golden, Freshwater, and Golden, 2003). Children with SLI performed with more errors and received significantly lower T-scores on the Stroop test than their peers. These children showed difficulty in inhibiting their automatic responses, even though they knew that this was the task. They did not forget the instructions, but exhibited a weakness in overriding a response-behavior that spontaneously occurred. Being able to overrule a behavior may be crucial in certain social situations. Because of their weakness in inhibition, children with SLI may be at higher risk than their typically developing peers for imitating deviant behaviors or engaging in interactions that are dangerous.

Inhibition also plays a critical role in emotion control. If children experience difficulty with inhibition they may produce more impulsive behaviors. Emotion control helps children to interact with others and to form friendships. It supports the regulation of the child's own behavior and that of others (Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holgren, and Suh, 1996). Our recent data suggest a strong correlation between emotion control and self-esteem. Children with more positive self-esteem showed better emotion-control, whereas children that were less able to regulate their emotions showed lower self-esteem. This pattern was particularly clear in the group of children with TLD. Children with SLI experienced more difficulty in emotion control than their peers. Their behavior often reflected impulsivity, which prevented these children from analyzing the social situation and developing appropriate strategies. Their impulsive behavior in social situations may be a sign of anxiety. These behaviors provide further examples for our "serial circuit" hypothesis. Peer relationships for children with SLI may be highly demanding on executive functions. If these children experience difficulties in analyzing the social context, redirecting their attentional focus, and monitoring their own behavior, then they will show uneasiness and anxiety in these situations. This will prevent these children form mirroring their partner's behavior and matching their social style. In turn, their partners will see them as "different". This will decrease their cooperation, empathy, and liking. Repeated experiences of such social interactions will further diminish the SLI children's abilities and motivation for establishing age-appropriate relationships.

CLINICAL IMPLICATIONS

Our research has shown the extent to which deficits in any of the various processes involved in social cognition (e.g., social perception, self-cognition, etc.), negatively affect other domains involved in social cognitive processing, as well as related functions, including language, communication, academics, and social interaction. Based on these findings and on the proposed "serial circuit" hypothesis, it would appear that the same socio-cognitive system, which so easily becomes misaligned when any one element within it is impaired, is also the system which can be drawn upon to initiate the process of repairing the social, cognitive, linguistic, and academic deficits experienced by children with SLI.

As mentioned earlier, one important piece involved in social cognition is behavior matching (e.g., mimicry), the unconscious imitation of body postures, facial expressions,

gestures and behaviors occurring between interactants (La France, 1979, 1982). The ability to engage in behavior matching has been found to play a dynamic and adaptive role in the development of rapport and empathy in interpersonal relationships. Findings from the current study have revealed that this unique ability is impaired in children with SLI, thereby significantly impeding their ability to form interpersonal relationships and harmonious interactions with other individuals. Given this finding, one compensatory strategy that we propose be utilized by professionals working with children with SLI is conscious mimicry. This strategy involves teaching these children to mimic the behaviors of other individuals at the conscious level, with the underlying premise that increases in behavioral mimicry will lead to increased levels of liking between them and their interaction partners (Bargh, 1999), and greater numbers of peer friendships. This is an especially pertinent feat, given the significant deficits that children with SLI display in their abilities to form social relationships, and the tremendous repercussions that such impairment has on the lives of these children (i.e., anxiety, depression, low self-esteem, poor academic performance, etc.). Moreover, based on the "serial circuit" hypothesis brought forth in the current study, it is argued that by remediating deficits exhibited in motor mimicry by children with SLI, therapy will have a positive effect on other impaired areas within the social-cognitive-academic-linguistic realms.

One strategy which may be used to increase displays of behavioral mimicry in children with SLI is the targeting of perspective taking skills, within the therapeutic context. As mentioned above, an increase in perspective taking results in more frequent imitation of the interactive partners' body posture, voice, and facial expression (Chartrand and Bargh, 1999). Given that children with SLI display weaknesses in their ability to recognize the perspectives and needs of their partners (Marton et al., 2005), it is no wonder that they exhibit an impaired ability to engage in behavioral mimicry. These findings however, can be employed positively to increase these children's ability to mimic others' behaviors by targeting perspective taking skills in therapy. In turn, increases in displays of mimicry will ultimately lead to increased liking between them and their partners (Bargh, 1999; Chartrand and Bargh, 1999). In addition to perspective taking, other executive functions that need to be incorporated into therapy of children with SLI are emotion control and inhibition (Cohen et al, 1998; Marton, Kelmenson, & Pinkhasova, 2007). These executive functions showed strong correlations with self-esteem.

In order to accomplish this feat, one task which may be employed by speech-language pathologists is training children with SLI to consciously match others' body postures. This objective may include an array of interactants with whom the child will be expected to mimic, including the child's clinician, parents, and siblings. This practice can also occur in diverse settings, ranging from, but not limited to, the therapy clinic to the child's home and school environments. Another activity which may be used to increase children's mimicry skills is imitation of imaginary partners. Research on friendship development has found that children experience the same emotions and behaviors with imaginary friends as they do with real friends (Gleason & Hohmann, 2006). These imagined interactions could provide children with SLI with positive social experiences to supplement real interactions.

An interesting finding which has clinical implications specifically related to mimicry is that individuals who are good at perspective taking have been found to mimic their interactive partners' body posture, voice, and facial expression to a much greater extent than those who show a weakness in taking others' perspectives (Chartrand & Bargh, 1999). Thus, high degrees of perspective taking are related to high degrees of mimicry. Given that children with SLI have been found to display weaknesses in their ability to recognize the perspectives and

needs of their partners (Marton, et al., 2005), it is no wonder that they exhibit an impaired ability to engage in behavioral mimicry. These findings however, can be employed in a top-down model to increase these children's ability to mimic others' behaviors by targeting perspective taking skills in therapy. In turn, increases in displays of mimicry will ultimately lead to increased liking between them and their partners (Chartrand & Bargh, 1999; Bargh, 1999).

An alterative method to the top-down model, is a bottom-up approach whereby therapy is used to bring about increases in perspective taking by increasing these children's abilities to mimic others' behaviors, given that mimicry and perspective taking skills have been found to share a reciprocal relationship. This method may be easier for children to engage in. Clinicians may alternate between top-down and bottom-up approaches to increase social skills and expect cumulative effects since the two methods stimulate the same socio-cognitive system.

The promotion of shared interests between children with SLI and their peers is another strategy which may be used to help set in motion the process of directly remediating the social deficits present in these children, and indirectly remediating other areas affected, as a result. Shared opinions, ideas and/or interests have been found to foster the development of rapport amongst individuals, and in turn, rapport has been found to promote the establishment of shared interests (Greenwald and Banaji, 1995). Participants who were told that they shared common opinions with an unfamiliar interactional partner, prior to their introduction to the individual, rated the partner as significantly more well-liked than those participants who were not told that they had opinions in common with their partners (Greenwald and Banaji, 1995). Smooth, harmonious interactions are more likely to occur when interactants are similar to one another and share common interests (Chartrand and Bargh, 1999). Thus, these findings provide a different avenue for professionals working with children with SLI, through which to enhance these children's ability to form interpersonal relationships, particularly with their peers, by encouraging these children to adopt similar interests and hobbies of peers (e.g., basketball, cars, chess, etc.).

Moreover, given the interdependent nature of rapport, perception, and behavior it is argued that once rapport is established, it will continuously be reinforced in a cyclical pattern. Following the establishment of rapport, a perceptual effect will occur, such that the interactants will begin to pay closer attention to one another, and do so for longer periods of time. As a result, the interactants will begin to mirror one another's behaviors, thus leading to greater levels of rapport (Dijksterhuis & Bargh, 2001). Furthermore, based on our "serial circuit" hypothesis, once the child begins to develop peer friendships, it is argued that other deficits seen in social-academic-linguistic areas should also begin to improve. For example, once children establish friendships with age-matched peers, they will begin to mimic their peers' behaviors at increasing levels, thereby reinforcing more appropriate pragmatic behaviors (e.g., eye-contact, gesture use, etc.). Professionals employing this strategy should determine the interests of their clients and that of their age-matched peers by speaking to the child and keeping contact with the child's teachers, parents, and peers.

Although the need for collaboration between therapists, teachers, parents, and clients seems to be obvious, our data from the questionnaires that we distributed to parents and teachers of children with SLI show no cooperation. The parents do not share their concerns with the child's speech-language therapist and teachers because they do not see them as a source of help for these children's social relationship issues. This lack of cooperation is -in

part- responsible for the teachers' and therapists' unawareness of these children's social problems. Another reason for these difficulties is the lack of information regarding strategies that are effective in improving these children's social communication. The results of our "teachers' questionnaire" show that mainstreamed SLI children's teachers have no strategies and no background knowledge that would enable them to help these children with their social/communication difficulties.

Based on the findings that children with SLI lack pragmatically appropriate behaviors (e.g., eye-contact, gestures, nonverbal communication, etc.), it is critical that professionals working with children with SLI be aware of these deficits and include these behaviors as targets for therapy, despite the long-held notion which continues to pervade the field of Speech and Language Pathology, that children with SLI do not exhibit impairments in social pragmatics. Based on the current findings, it would appear that once these children begin to engage in more typical levels of pragmatic behavior, individuals interacting with these children will mimic their behaviors at increasing levels, thereby leading to greater rapport amongst them and children with SLI.

Another critical implication derived from the current study is the need for a shift in the treatment of SLI from an individual-centered plan, to a more family-oriented one. The current study has demonstrated the persistent inconsistencies in perception that permeate practically every aspect of interpersonal relationships that children with SLI are a part. These inconsistencies have been explained by the "serial circuit" hypothesis in this study, which suggests that social interaction is a dynamic process wherein the perceptions and behaviors of one individual directly influence those of their interactional partner. For children with SLI, various inter-related elements contributing to successful interpersonal interaction are out of sync, causing a change in the way in which these children communicate with others, and in effect, how others interact with them. From early infancy, parents mimic the behaviors of their children, like opening their mouth when their infants open their mouth to eat (Meltzoff & Moore, 1997). However, because children with SLI often display atypical behaviors, a breakdown may occur in the interaction between parent and child, such that parents imitate less frequently the behaviors of their children, and as a result perceive their children inconsistently when compared to their children's self-perception. Similar patterns may occur in relationships with peers and other relevant persons, such as teachers.

Family-centered therapy should also include the siblings of children with SLI, in addition to their parents. If siblings are not included in the therapy process, they may experience feelings of exclusion and they may experience a lack of attention from their parents. Not only is sibling exclusion not good for family dynamics, it also places siblings of children with SLI at higher risks for developing symptoms associated with social exclusion, such as depression, low self-esteem, poor intellectual performance, etc. It is also helpful from the angle of children with SLI to have their siblings be involved in therapy, since most of their difficulties in social interactions occur with peers. Since their siblings are children themselves, involving them into therapy tasks can contribute to the success of the child with SLI and can also foster carryover to peer interactions.

In keeping with the principle of incorporating children into the therapy of children with SLI, another implication of the current research is the importance of establishing group therapy as part of the treatment plan for these children. Providing one-on-one therapy for children who experience difficulty in creating solid friendships does not appear sufficient in remediating this social deficit; rather, effective therapy should include group therapy for

children with SLI which would give these children the opportunity to interact with children of similar ages in a therapeutic setting wherein their behavior can be monitored and corrected. Additionally, given the negative effects that social exclusion has on the lives of these children, group therapy would allow these children to feel socially included and accepted. It would provide them with the opportunity to interact with others that understand them and the negative experiences that they go through. These aspects contribute to the creation of a supportive environment for these children to interact in, and to the formation of positive social experiences which ultimately may help reverse some of the negative experiences these children have encountered.

One of the most influential determinants of self-perception is feedback received from others (McGuire, 1984). One of the greatest contributors to the low-self esteem reported by children with SLI, and in effect, their social performance (Chen, He, & Li, 2004), is the negative feedback that they receive from others. Given the dynamic relationship between parent and child, it can be deduced that in order for therapy to be truly effective, it must not only focus on the remediation of the child's linguistic and pragmatic deficits, but should also involve the way in which behaviors displayed by others affect the child's therapeutic progress.

A further critical implication, which has its roots in the literature on social exclusion, is the need for professionals working with children with SLI, to be conscious of making these children feel accepted and well-liked, by providing high degrees of verbal praise, in addition to including them as active participants in the therapeutic process. Individuals who are excluded from social groups experience poor intellectual performance, derogation of the rejecters, escape from self-awareness, self-defeating behavior, aggressive behavior and/or depression (Bourgeois and Leary, 2001). Children with SLI often experience social rejection and exclusion from their peers and receive negative feedback from their parents and teachers (Marton et al., 2005). Thus, they are at high risk of developing social, academic, cognitive, and psychopathologic problems (Bourgeois & Leary, 2001) that may persist throughout the lives of these children since past experience affects current behavior even if those influential events are not consciously remembered (Greenwald & Banaji, 1995). It is critical for professionals working with children with SLI to make a conscious effort to be friendly, warm, and open to their clients, and to include them as active participants in the therapeutic process, in order to provide them with positive social experiences to help reverse some of the negative effects of their prior experiences. Additionally, it is vital that professionals monitor their verbal and nonverbal behavior when interacting with children with SLI, since research has demonstrated that individuals, who are rejected from social groups, as is the case with these children, are more sensitive and accurate in interpreting the facial expressions and vocal tone changes of their communicative partners (Pickett, Gardner, & Knowles, 2004).

The observational data we collected on client-clinician interaction in a student-training clinic indicate that clinicians display a number of nonverbal behaviors detrimental to the therapeutic relationship, including face leaning, self-touching, lip biting, closed arms, and watch checking. Given that these children may be hyper-sensitive to decoding nonverbal communication, and that conversants are for the most part unaware of the nonverbal behavior they express, it is important for professionals to monitor their verbal and nonverbal behavior. Behavior monitoring may ensure that therapists do not unconsciously communicate negative intentions to these children, further causing these children to feel rejected and thereby adding to the many negative experiences that children with SLI so often encounter.

Moreover, findings from the current research have demonstrated that an interdisciplinary approach to the treatment of SLI is warranted. As mentioned above, clinicians should be trained to counsel clients on a basic level for issues related to their speech and/or language impairment. However, when a client's issues extend beyond the scope of the clinician's training, it is important that the clinician refer the client to a psychologist or social worker with whom they can work closely with. Clinicians can provide these professionals with insight into the nature of the language impairment and the negative social, emotional, and psychological effects that this particular impairment can have on individuals with SLI. Such information is critical for psychologists to have in order for psychotherapy to be effective.

CONCLUSION

This chapter offers insight into the dynamic nature of social cognition through examples from a population that by definition exhibits normal social relationships. We examined how the specific patterns observed in this special population -children with SLI- may help us develop theoretical hypotheses regarding the relationship between social perception and communication. The proposed "serial circuit" hypothesis is based on observations and experiments involving children with SLI, their peers, parents, and teachers. According to this theoretical framework, the various elements of social cognition including self-perception and others' perception interact with communication similarly to a serial electric circuit where every light bulb has to be in place -functioning appropriately- in order to avoid darkness. A breakdown at any point in the circuit results in malfunctioning of the system. Although during the development of social cognition children apply many compensatory strategies to ensure effective social interaction with the environment, the strong interrelationship among the influential factors may either enhance or disable the system at work.

Children with SLI showed many individual differences and weaknesses in various social-cognitive skills. The data we collected through observations, interviews, and experiments revealed impairments in every target area including mimicry, gesture use and eye contact, executive functions -emotion control, perspective taking, attention switching, inhibition, and behavior monitoring-, self-perception, and mismatches in social perceptions between the participants and the people in their environment. None of the previous studies included such a comprehensive examination of social cognition in children with SLI than the present paper.

Previous research has explained SLI children's difficulty in peer relationships based on a link between social interaction and language impairment. The following theoretical frameworks have been offered to explain this relationship. The theory proposed by Redmond and Rice (1998) suggests that the language-communication deficit in children with SLI inhibits these children's adequate participation in social interactions; therefore these children are more often rejected by their peers than typically developing children. These negative experiences result in social deficits in this population. The "general processing capacity limitation" model offers a different interpretation of the social deficits observed in children with SLI. According to this theory, children with SLI encounter difficulties in social relationships because their working memory limitations prevent them from carrying out appropriate conversations. Thus, these children's social problems are caused by a non-specific working memory limitation (Bishop, 1997). Bishop offers an alternative explanation

as well. Children with SLI have a primary deficit in social cognition, which has an impact on the development of both communication and social interaction.

There are numerous problems with these theories. They provide general explanations of the social deficits observed in children with SLI, without focusing on the specifics of social-cognition. For example, the "general limitation in processing capacity" theory has been used to explain many other cognitive limitations in children with SLI, such as difficulties in reading and listening comprehension, in math, etc. On one hand, these models are not focused enough; on the other hand, they do not account for all those weaknesses that children with SLI experience in social cognition. The "serial circuit" hypothesis we proposed in this chapter is applicable to both normal and impaired functioning. It considers not only the subject's inner abilities or the environment's impact, but integrates all these various aspects. It also includes a strong emphasis on the dynamic nature of social cognition. With this theoretical approach we are able to examine and interpret the wide range of social-cognitive dysfunctions that are present in children with SLI. This approach also helps us to consider environmental resources for remediation of social-cognitive problems. A review of the social psychology literature helps us broaden our perspective on factors that influence those social situations and contexts that children with SLI may encounter. On the other hand, we believe that the description and analysis of the difficulties that children with SLI experience with interpretations of these deficits add to the clarification and understanding of various social-cognitive phenomena studied by social psychology.

Future research involving qualitative research methods, such as observations in naturalistic settings may further our knowledge on the relationship between social cognition and communication in children with SLI. We examined children's self-esteem only from a social perspective and did not focus on many other aspects (e.g., academic self-esteem). An examination of the relations between children's self-perception, others' perception and cognitive-academic achievements is necessary to further develop the proposed "serial circuit" hypothesis.

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Chapter 6

THE HOSPITABLE SCHOOL: SOCIAL SUPPORT, SOCIAL EXPERIENCE, AND ENVIRONMENT FACTORS*

Jenifer Cartland and Holly S. Ruch-Ross
Children's Memorial Research Center
David B. Henry
Institute for Juvenile Research, University of Illinois at Chicago

ABSTRACT

In a previous attempt to measure school-based social capital for adolescents, the Hospitality Scale was developed and found to be negatively associated with behaviors (substance use and firearm ownership) that are considered to be related to social isolation and violent behavior. The current chapter relates the Hospitality Scale to broader notions of social support and social experience in order to isolate the distinct contribution of Hospitality as a form of social capital; it further examines Hospitality as a school-level construct for middle schools and high schools. The findings presented suggest that Hospitality is an independent construct, associated with social support and social experience to a limited degree at both the student level and the school level, though in somewhat different ways for students and schools. We conclude by considering further analytic paths to associate both student-level perceptions of Hospitality and school-level Hospitality scores to student risk behavior.

INTRODUCTION

Do some school environments aggravate social isolation more than others? Alternatively, do some school environments diffuse social isolation so that individuals are less likely to

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strike out and more likely to feel safe? These questions were posed by the authors in a previous study that reviewed the development of a new scale, the Hospitality Scale, which is intended to capture the extent to which adolescents feel at home at school, a form of school-based social capital (Cartland, Ruch-Ross & Henry, 2004). The scale was found to be negatively associated with behaviors (substance use and firearm ownership) that are considered to be related to social isolation and violent behavior. Thus, students who feel more at home at school are less likely to demonstrate negative conflict resolution tactics, substance use, and other negative behavior.

Left unanswered in that previous study was how the Hospitality Scale related to the perception of general social support from peers, parents, teachers, and other individuals in the school environment. Is Hospitality simply a reflection of these sources of social support, or does it measure an independent construct? Further, because the study used to validate the scale involved a restricted number of schools, we were unable to explore the extent to which Hospitality is a characteristic of the school environment, rather than more narrowly a student characteristic. The current chapter addresses both of these questions.

We examine data from three samples (gathered for three different studies) that employed the Hospitality Scale. We subsequently refer to these samples as Sample 1, Sample 2 and Sample 3. By combining these three samples, we are able to examine Hospitality for 35 schools, and thus consider Hospitality as a true environmental characteristic and to explore ways to characterize hospitable schools. In Sample 3, the Hospitality Scale is employed with a comprehensive measure of social support, one which differentiates support from parents, teacher/administrator, classmate and close friend (Harter, 1985). The analysis of Sample 3 allows us to consider the independence of the Hospitality Scale from the broader concept of social support.

Hospitality and Social Support

Commentators and researchers alike have drawn a strong association between being bullied, social isolation, and lashing out violently towards peers (Nansel, Overpeck, Pilla, Ruan, Simons-Morton & Scheidt, 2001; Spivak & Prothow-Smith, 2001). They contend that teasing, bullying, and "picking on" individuals facilitates increasing social isolation that may, for some students, lead to extremely violent acts against peers.

The literature on peer victimization points to the role of the social environment in the development of risk behaviors. Although there is broad consensus about the role of social support, the variety of operational definitions for social support make precise linkages between social support and risk behavior unclear. This makes it difficult to assess the role of Hospitality and other environmental measures as independent factors in the development of risk behaviors. Further, there is inconsistency between studies in their units of analysis. Most studies are performed at the student level, even though "social environment" is a characteristic of the school, and only partially tapped by measuring an individual student's immediate, one-on-one social contacts. This section will explore several methods for operationalizing social support that are particularly revealing for our purposes, although they are applied to student-level data. In a later section, we will examine unit of analysis issues in order to consider environmental factors at the school level.

The perception of social support has been operationalized many ways. Some studies focus on social experience, rather than support. The Social Experience Questionnaire distinguishes among three types of peer victimization and includes a subscale called "pro-social behavior" (the study subject reports on caring acts performed for him or her by peers) (Storch, Crisp, Roberti, et al., 2005). One study that examines relational victimization (aggression focused on altering a victim's relationships with others) and overt victimization shows a connection between relational violence and social anxiety and social phobia for boys (Storch, Masia-Warner, Crisp, et al., 2005), suggesting a direct tie between relational violence and mental health. Further, since the study examines social phobia over time, it is able to suggest a causative link between social experience and social phobia. Sullivan, Ferrell and Kleiwer (2006), distinguished between physical, verbal, and relational victimization and find, generally, a strong link between physical and relational victimization and risky behavior.

These findings linking social experience to risk behavior are important. However, the role of social support, separate from the narrow inverse of peer victimization, is not incorporated into most of these models. In our study of school hospitality (Cartland, Ruch-Ross & Henry, 2004), the association between the perception of a hospitable school environment and victimization was mediated by other environmental (school norms concerning aggression) and personal (reported use of negative conflict resolution tactics with close friends) factors. Such mediated relations pointed to the limitations of defining social support in terms of the more narrow social experience (i.e., not experiencing peer victimization).

A number of studies have examined the role of social support in the development of risk behaviors using fuller operationalizations of social support. One study of sexual minority youth, for example, examined the role of social support from mothers and best friends in mediating the effects of peer victimization in the development of externalizing behavior and depressive symptoms (Williams, Connolly, Pepler, et al., 2005). Social support (especially maternal support) and victimization predicted externalizing behavior and depressive symptoms to a greater extent than students' status as a sexual minority. This would suggest that social support and social experience (victimization) have a key role to play in the development of risk behaviors – social support reducing risk behaviors and negative social experiences increasing them. A similar notion of social support in the development of resilience is explored in a study of Native American youth (LaFramboise, Hoyt, Oliver, et al., 2006). Three constructs related to social support were measured for the study – maternal warmth, the experience of discrimination, and community support for school achievement. All three of these varied as one would predict with students' resilience. Both maternal warmth and community support were positively associated with resilience; experiences of discrimination were negatively associated with social support.

Turning to even broader operationalizations of social support, perceived social support from family and friends (using a scale developed by Procidano and Heller, 1983) was associated with gambling among middle school and high school students (Hardoon, Gupta & Derevensky, 2004). Students were classified in one of four increasingly problematic categories: non-gamblers, social gamblers, at-risk gamblers, and probable pathological gamblers. Social gamblers reported more social support from friends than did at-risk gamblers; and non-gamblers and social gamblers reported more social support from parents than did the two most severe categories (at-risk and probable pathological gamblers). The same scale was revised and expanded to include a subscale for perceived support from school personnel to examine the role of social support in the development or impairment of self-

esteem, and in the development of internalizing and externalizing behaviors (DuBois, Burk-Braxton, Swenson, et al., 2002). The latter study developed a model linking social support to internalizing and externalizing behaviors, showing the mediational effects of self-esteem. Interestingly, when peer support was disproportionate to adult-related support (i.e., there was more peer support than support from parent and school personnel), youth demonstrated more significant problem behaviors.

Together, these studies confirm the importance of family and adult support in avoiding risk behaviors (Felner, Brand, DuBois, et al, 1995), but provide an unclear picture of the role of support from peers and virtually no understanding of the role of the school environment. Neither can the studies shed light on how the environment and more immediate perception of social support relate.

A more accurate picture needs to be drawn, one in which the interactions between environment, social support and victimization can be observed. In this study, we will examine how the perception of a hospitable environment is associated with four forms of social support, including two forms of peer support (support from classmates and support from close friends), and peer victimization. Also, by examining both subscales of the Hospitality Scale, we will differentiate between the passive sense of feeling at home at school and the more active willingness to help create a more hospitable environment.

Hospitable Schools

There is little scholarship examining variations in school cultures at the school level, and little reflection on how school climate may be a dynamic process. Social scientists have explored the role of peers in the emergence of social isolation (Tani, Chavez & Deffenbacher, 2001; Cotterell, 1996) and of behaviors associated with social isolation (Mason & Windle, 2001). Even so, these studies typically view social isolation from the perspective of the isolated individual, rather than the perspective of the isolating environment. Lashbrook (2000) suggests a more dynamic process when he points out that the literature on peer pressure consistently presupposes the passivity of the individual, rather than viewing him or her as a part of a group that creates an environment for other individuals to experience. The reciprocity between members and groups is explored in some studies examining the psychological sense of community (e.g., Brodsky, O'Campo & Aronson, 1999), but the focus has been restricted to adults, an application that may not generalize to adolescents in schools. The Hospitality Scale, with its two subscales, is an attempt to address this weakness in the literature. One subscale isolates the passive sense of feeling at home in school, while the other subscale isolates the more active behavior of making the environment better for others.

The need for such a distinction is confirmed by research dealing with dissent and difference among adolescents. For example, D'Augelli and Patterson (2001) point to, not only the social isolation of gay youth, but also the strong intolerance from their peers. This intolerance was expressed in a range of actions targeted at the gay youth, from pressure to conform to bullying and from taunting to property damage. Recent findings indicate that social support (parent, close friend, and friendship networks) mediates the negative effects of poor treatment by peers that is experienced by gay youth, reducing victimization and depressive symptoms among them (Williams, Connolly, Pepler, et al., 2005). Back (1996) explores the complexities of racism and tolerance among urban youth, suggesting that the

limits of tolerance vary considerably by community. Even among majority race adolescents who reject "racism," the tolerance displayed may be superficial and may not extend to more than one minority group. An additional study (LaFromboise, Hoyt, Oliver, et al., 2006) suggests that maternal support and the perception of community support for success in school mediates the effects of perceived discrimination on resiliency among Native American adolescents.

Unfortunately, the school environment itself has not yet been explored in studies examining the effects of discrimination or social intolerance among youth. The studies using students as the unit of analysis *suggest* that adolescents who feel socially isolated (because they are gay or of a minority race) upon entering their schools, confront environments that are forgiving and inclusive, environments that are unforgiving and exclusive, or environments that are somewhere in between the two extremes. From our perspective, the quality of the school culture in terms of forgiveness and inclusiveness defines the extent of "social capital" they find at school—the number and quality of social resources to which the individual can turn when a problem arises. The Hospitality Scale attempts to broaden this literature by measuring the perception of being welcomed in the school and the effort to make others feel welcome.

In the current study, we attempt to move this literature forward by examining school-level variance in Hospitality among 35 schools that participated in one of three studies the authors conducted. The associations between the Hospitality Scale and its two subscales and other environmental indicators are computed and discussed.

METHODS

We combined data from three different school-based evaluation studies that employed our measure for hospitality. The three studies were performed in different years. Although this is not optimal (because the results might be influenced by historical events, although our previous analyses do not suggest that this is the case), it allows us to analyze data from 35 different schools, enough to present credible school-level analyses (Bloom & Raudenbush, 2004).

Each study included schools with widely varying sample characteristics (Table 1). Students in the first study's sample (Sample 1) had the most diverse demographic backgrounds. Some students came from one outlying suburban area and others came from two neighborhoods in Chicago. Sample 2 includes data from a study performed in a group of inner-ring Chicago suburbs with highly concentrated minority populations. Finally, Sample 3 includes students from seven rural school districts located in southern Illinois.

For all schools in the sample except one, there is a one-to-one association between having a separate building and having a principal. In one rural school district, however, all the grade levels in the school district (Pre-K through 12th grade) shared a single building. The middle school and high school each had a different principal, leading us to decide that each was a separate school, even though they shared a building.

The Institutional Review Board of Children's Memorial Research Center oversaw each of the three studies. The requirement for written informed consent was waived. Students in each of the schools were surveyed in the same way – by research staff in their classrooms. Fewer

than 1% of students were excluded from the study at the request of their parents. As a result, virtually all students attending school on the day of the survey were included in each of the datasets.

Table 1. Sample characteristics

	Sample 1 (n=1482)	Sample 2 (n=1379)	Sample 3 (n=1567)
White	893	47	1423
	60.3%	3.4%	90.8%
African American	369	881	56
	24.9%	63.9%	3.6%
Latino	146	380	18
	9.9%	27.6%	1.5%
Other	74	61	43
	5.0%	2.5%	2.4%
Number of schools	15	7	13
Grades	8, 11	7, 9	6, 8, 10, 12
Urbanicity	Mixed	Suburban	Rural
Year collected	2000	2003	2006

The survey included a wide range of items or scales focusing on bullying, victimization, substance use, weapon-carrying, and school failure issues, as well as scales that were hypothesized to related to protective factors. Table 2 presents an outline of the scales used in the present analyses.

The *Hospitality Scale* contains 9 items, divided into two subscales: 1) the degree to which a student feels at home, and 2) the degree to which the student makes others feel at home. With the study sample, the reliability for the 9-item full scale was .79 by Cronbach's alpha. The first subscale had an alpha of .64 and the second an alpha of .66.

*Social support wa*s measured by Harter's (1985) social support scale, which includes four subscales intended to measure perceived support from parents, teachers, school mates and friends. The scale has 24 items, four for each subscale, and scores range from 24 to 96. The mean score for participants in these studies is 77.1, indicating moderate to strong overall social support. The full scale had a reliability of .88 by Cronbach's *alpha.* The parent subscale had an *alpha* of .83; the teacher subscale an *alpha* of .82; the classmate subscale an *alpha* of .73; and the close friend subscale an *alpha* of .83.

Family support for school attachment (Cartland & Ruch-Ross, 2006) examines the extent to which students report family activities that support school attachment (e.g., "My family comes to things at school," or "My family helps me with my homework"). The scale contains 5 items on a four-point scale, ranging from a high of 4 points for activities which happen "Everyday" to a low of 1 for activities that happen "Never." Possible scores range from 5 to 20. The mean overall score in these samples was 13.6, indicating modestly positive support for school attachment. The scale has a Cronbach's *alpha* of .82, with the five items loading in a factor analysis with loadings of at least .50.

Table 2. Summary of measures

Construct	Source	Details	Sample		
			1	**2**	**3**
Hospitality	Cartland, Ruch-Ross, Henry (2003)	9 items; 2 subscales (I feel at home, I make others feel at home) Increases as hospitality increases	x	x	x
Social support	Harter	20 items; 4 subscales (support from parent, teacher, classmate, friend) Increases as social support increases			x
Family support for school attachment	Cartland, Ruch-Ross (under development)	5 items Increases as family support increases		x	x
Normative beliefs about aggression	Henry, Cartland, Ruch-Ross, Monahan (2004)	11 items; 2 subscales (provoked and unprovoked) Increases as aggression is increasingly accepted as norm	x	x	
Sense of safety	Henry, 2000	8 items Increases as one's sense of safety increases	x	x	
Aggressive behavior	CHDL, 2000	4 items Increases as one's aggressive behavior increase	x	x	x
Peer victimization	Orpinas and Kelder, 1995 (adapted)	13 items; 2 subscales (verbal and physical) Increases as one's victimization increases	x	x	x

School norms for aggression were assessed with 11 items that ask the individual's opinion on other students' responses to aggression by their peers (Henry, Cartland, & Ruch-Ross, 2004). A response that other students would think it was "OK" was scored as 1, "Not OK" was scored as –1 and "Wouldn't care" was scored as zero. The reliability of this measure by Cronbach's alpha was .97, and the average score was .18.

Sense of safety is measured through an eight-item scale in which students report whether they feel safe in certain places at and on their way to and from school "always, sometimes, or never" (Henry, Ruch-Ross & Cartland, 2006). The scale ranges from 0 (I never feel safe anywhere) to 16 (I always feel safe everywhere). The mean for this study is 10.7, suggesting moderate to high feelings of safety in most situations. In a confirmatory factor analysis, all factors loaded on a single factor at the .70 or higher. The Cronbach's *alpha* for the scale in this sample was .88.

Victimization was measured using a scale adapted from Orpinas and Kelder (1995, cited in Dahlberg, Toal, & Behrens, 1998). The scale is comprised of 13 items that query students about the number of times they have been victimized by peers during the last week (not at all,

one time, more than one time, coded 0, 1 and 2, respectively). The responses to the 13 items were summed (highest possible score is 26). The full measure includes two subscales relating to verbal and physical victimization. The internal consistency of the full measure by Cronbach's alpha was .90 and the average score was 5.7.

Aggressive behavior was measured using a four-item abbreviated and modified version of the Orpinas aggression scale (1993, cited in Dahlberg, Toal, & Behrens, 1998). The scale asks students the number of times they have "Hit someone for no reason," "Been mean to someone," "Yelled at someone," and "Tried to hurt someone's feelings" in the last week. The scale is coded in the same way as the victimization scale, with a highest possible score of 8. The internal consistency of this measure was .76 by Cronbach's alpha and the average score for this sample was 2.3.

The current analysis was performed in SPSS v. 12. The data from the three samples were combined into one data file and the scale scores were averaged for the school-level analysis using the aggregate procedure.

RESULTS

Hospitality, Social Support and Social Experience

The Hospitality Scale has a statistically significant association with social support, especially from teachers (Table 3). The proportion of the variance of the Hospitality Scale explained by the social support measures ranged from a low of 4.8% for classmates to a high of 19.4% for teachers. The modest coefficients indicate that the Hospitality Scale is, indeed, measuring a distinct construct, though one related to social support.

Like the full scale, both subscales of the Hospitality measure have statistically significant associations with social support. However, in the *I Make Others Feel at Home* scale, these coefficients are weaker than those in the *I Feel at Home* subscale. Because both subscales are highly correlated with one another, the association between each subscale and social support was isolated by computing partial correlation coefficients, using one subscale as a control for the other. This procedure causes both sets of correlation coefficients to drop, but causes the *I Make Others Feel at Home* subscale to drop almost to the level of complete statistical insignificance. For all four social support subscales, the partial correlation coefficients reveal almost non-existent associations. These data confirm that the Hospitality Scale and its subscales are independent constructs from social support; this is seen most clearly in the *I Make Others Feel at Home* subscale. This subscale may be most clearly distinct in its content.

Social experience, in terms of physical and verbal victimization, is related as one would expect with the full Hospitality Scale and the *I Feel at Home* subscale. Victimization has no statistically significant association with the *I Make Others Feel at Home* subscale, controlling for *I Feel at Home*, suggesting that this subscale measures a construct beyond social experience, or non-victimization.

Table 3. Correlations and partial correlations with social support, Hospitality Scale (full and subcales), student-level data

Scale	Full Hospitality Scale	I feel at home subscale	I feel at home (controlling for I make others feel at home)	I make others feel at home subscale	I make others feel at home (controlling for I feel at home)
Social support:					
Social support from parents (Sample 3)	.29**	.30**	.23**	.20**	.00
Social support from teachers (Sample 3)	.44**	.46**	.34**	.32**	.04
Social support from classmates (Sample 3)	.22**	.26**	.24**	.13**	-.06*
Social support from close friends (Sample 3)	.27**	31**	.27**	.16**	-.06*
Social experience:					
Victimization (all samples)	-.06**	-.06**	-.06**	-.03*	.01
Verbal victimization	-.03	-.04*	-.05**	-.00	.03
Physical victimization	-.10**	-.09**	-.06**	-.08**	-.03

* p<.05, ** p<.01

Hospitality and Other Environmental Measures

Table 4 presents analyses that help locate Hospitality in the frame of other school climate and school safety measures. Many of the findings follow the pattern of the Hospitality and social support analysis: the full scale results in the strongest correlation, the *I Feel at Home* subscale repeats this, with coefficients lowering slightly when *I Feel at Home* is controlled by *I Make Others Feel at Home*. Associations between two of the climate measures (Family Support for School and Sense of Safety) and the victimization measures with *I Make Others Feel at Home* are weaker than they are for *I Feel at Home*, and become substantively unimportant when *I Make Others Feel at Home* is examined controlling for *I Feel at Home*.

There are two very interesting exceptions to this. First, the Normative Beliefs about Aggression scale has a weak and negative association with the full Hospitality Scale and the *I Feel at Home* subscale, but a much stronger association with *I Make Others Feel at Home*. This is particularly true when controlling for *I Feel at Home*, suggesting that school climates in which students report reaching out to other students are characterized by less acceptance of aggression in the environment. Related to this, the *I Make Others Feel at Home* subscale is more strongly and negatively associated with self-reported aggressive behavior than the *I Feel at Home* subscale.

Table 4. Correlations and partial correlations with environmental factors and social experience variables, Hospitality Scale (full and subcales), student-level data

Scale	Full Hospitality Scale	I feel at home subscale	I feel at home (controlling for I make others feel at home)	I make others feel at home subscale	I make others feel at home (controlling for I feel at home)
Family support for school (Samples 2 and 3)	.35**	.36**	.25**	.27**	.08**
Normative beliefs about aggression (Samples 1 and 2)	-.10**	-.06**	-.03	-.14**	-.32**
Sense of safety (Samples 1 and 2)	.15**	.16**	.12**	.11**	.01
Aggressive behavior (all samples)	-.19**	-.16**	-.05**	-.19**	-.12**

* p<.05, ** p<.01

Multiple Regression Analyses

In an attempt to articulate the connection between the perception of a hospitable school environment, social support and social experience (peer non-victimization) more fully, the social support, aggressive behavior and victimization variables were entered simultaneously as independent variables in multiple regression equations for each of the three Hospitality variables (Table 5). Like the previous analysis, the subscales are regressed two ways: with and without the use of the alternate subscale as a control variable. This procedure permits each subscale's unique contribution to the understanding of the school environment to be explored.

For the full scale and the *I Feel at Home* subscale, all variables except support from classmates explained a statistically significant portion of the variance, and did so in the expected direction (e.g., social support from parents is positively associated with feeling at home at school). The single exception was verbal victimization, which was positively associated with the full Hospitality Scale, meaning that students who experienced more verbal victimization felt more at home at school, though this finding is not repeated in the *I Feel at Home* subscale analysis.

When *I Make Others Feel at Home* is controlled for in the regression of *I Feel at Home,* a more parsimonious model results. As students get older, they felt less at home at school; and as students felt more supported by teachers and close friends, they felt more at home at school. Surprisingly, social support from parents and from classmates has no relationship with feeling at home at school when controlling for scores on the *I Make Others Feel at Home* subscale. Neither of the social experience variables was associated with feeling at home at school. Thus, although feeling at home at school is distinct from social support, it is

most strongly related to feeling supported by teachers and close friends, regardless of social experience at school (in terms of peer victimization), social support from parents, or social support from classmates.

Table 5. Regression analysis for Hospitality Scale (full and subcales), social support and social experience items, student-level data (Sample 3)

Scale	Full Hospitality Scale	I feel at home subscale	I feel at home (controlling for I make others feel at home)	I make others feel at home subscale	I make others feel at home (controlling for I feel at home)
Demographic variables:					
Gender	.09**	.05*	-.01	.11**	.08**
Age	-.06*	-.06**	-.05*	-.04	-.00
Social support variables:					
Social support from parents	.08**	.06*	.01	.08**	.05*
Social support from teachers	.32**	.33**	.20**	.24**	.04
Social support from classmates	.05	.05	.02	.05	.02
Social support from close friends	.08**	.12**	.11**	.01	-.07*
Social experience variables:					
Verbal victimization	.10**	.06	-.01	.14**	.10**
Physical victimization	-.15*	-.12**	-.05	-.15**	-.07*
Control variable:					
Alternate subscale (I feel at home/I make others feel at home)	n.a.	n.a.	.53**	n.a.	.61**
R squared total	.23	.25	.49	.14	.40
R squared of all variables controlling for alternate subscale	n.a.	n.a.	.09	n.a.	.02

* p<.05, ** p<.01

The *I Make Others Feel at Home* subscale demonstrates an entirely different pattern of associations, indeed, almost the opposite set of associations as are shown by *I Feel at Home*. In both models (controlling for and not controlling for *I Feel at Home*), gender had a positive and statistically significant association with making others feel at home. Girls had higher

scores on this subscale than boys. For both models, parental social support showed a weak but persistent association with making others feel at home. Support from teachers was strongly associated with *I Make Others Feel at Home*, until *I Feel at Home* was entered as a control variable. Then, teacher support lost its association, and support from close friends gained significance. What is most interesting is that youth who made others feel at home reported *less* support from close friends than students who did not. Along the same lines, students who reported making others feel at home at school are *more* likely to report the social experience of verbal victimization. As for the analyses of the other subscale, however, physical victimization was negatively associated with *I Make Others Feel at Home*.

School-Level Analysis

Figures 1-3 detail the three hospitality measures by school for each of the thirty-five schools in the analysis. For each measure, the pattern is similar: means and 95% confidence intervals reflected both overlapping and non-overlapping ranges in the perception of Hospitality and the two subscales. It is worth noting that the cell size varied quite a bit for each school, from a low of 32 students to a high of 617 students. Hence, most of the differences in the size of the confidence interval range are related to sample size. In general, the means for each school range about 5 points for each scale, which is not very large, but for the schools with larger sample sizes, substantial statistical differences exist.

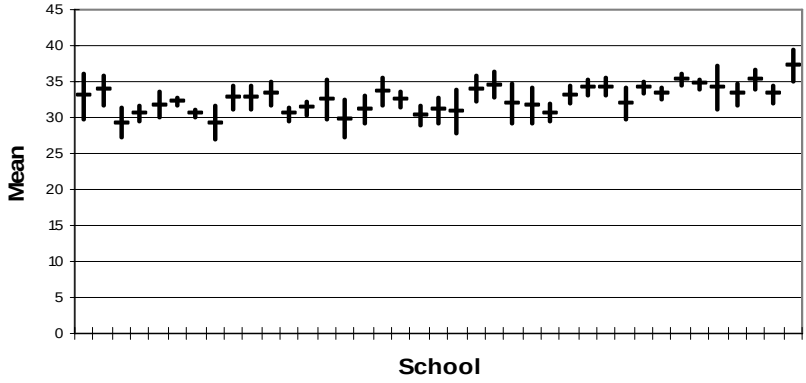

Figure 1. Hospitality Scale by school: Means and 95% confidence intervals.

Hospitality varies much as was predicted when the analysis is performed at the school level. As can be seen in Table 6, the n's are small for this analysis and warrant attention to coefficients that are statistically significant with a less rigorous test ($p < .10$). As with the student-level analysis, Family Support for School, Normative Beliefs about Aggression, Sense of Safety and Aggressive Behavior have noteworthy findings, though Victimization does not. Family Support for School seems best correlated with the full Hospitality scale, because the partial correlations for the subscales are weak. Similarly, Normative Beliefs about Aggression is very strongly associated with the full scale, and less so with the two subscales. Normative Beliefs about Aggression explains a full 64% of the variance in the Hospitality

Scale, while the subscales appear to be more independent constructs in the partial correlation analysis.

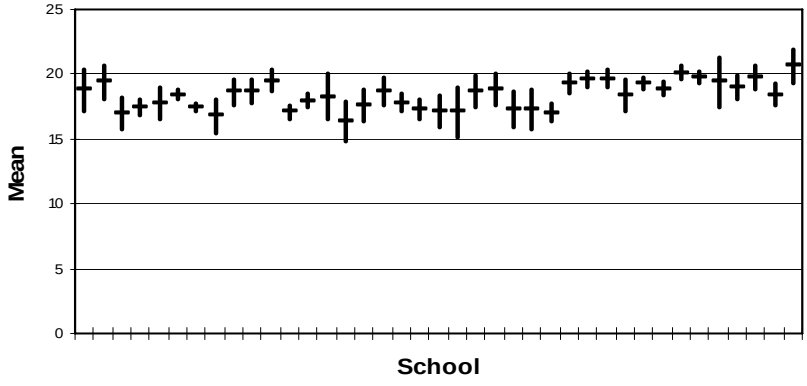

Figure 2. “I feel at home” by school: Means and 95% confidence intervals.

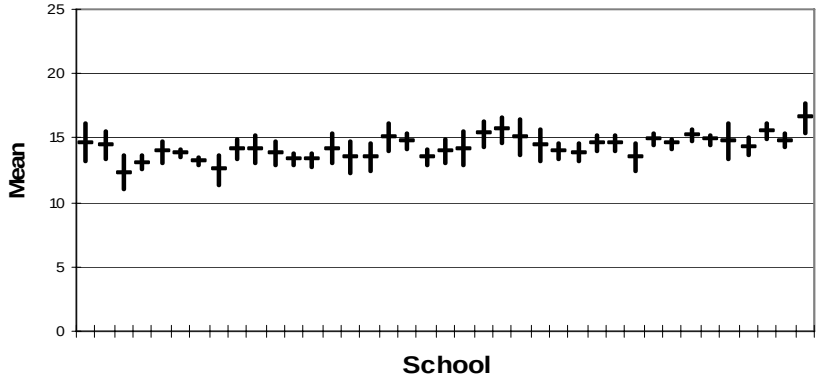

Figure 3. “I make others feel at home” by school: Means and 95% confidence intervals.

Sense of Safety is positively associated in the partial correlation with *I Feel at Home*, and negatively associated in the partial correlation with *I Make Others Feel at Home*. The meaning would seem to be that school environments with students who feel safe have students who also feel at home, but that school environments with students who feel safe have students who DO NOT make others feel at home, an unexpected finding.

As one would expect, Hospitality is higher in schools with students reporting less aggressive behavior. The subscale *I Make Others Feel at Home*, however, is not associated with aggressive behavior when controlling for the *I Feel at Home* subscale. Like the findings regarding Sense of Safety, these may better be understood with a larger number of schools that could withstand a procedure in which more possible confounders can be controlled for, or a design that would permit longitudinal assessment of student level data.

Table 6. Correlations and partial correlations, Hospitality Scale (full and subcales) by school

Scale	Full Hospitality Scale	I feel at home subscale	I feel at home (controlling for I make others feel at home)	I make others feel at home subscale	I make others feel at home (controlling for I feel at home)
Family support for school (n=20)	.45**	.48**	.31	.40*	.11
Normative beliefs about aggression (n=22)	-.80***	-.71***	-.44**	-.69***	-.39*
Sense of safety (n=22)	.09	.26	.47**	-.12	-.42*
Aggressive behavior (n=35)	-.51***	-.55***	-.46***	-.35**	-.10
Victimization (n=35)	.13	.11	.02	.14	.09
Verbal victimization	.12	.08	-.03	.15	.13
Physical victimization	.14	.15	.10	.11	.01

*p<.10, ** p<.05, ***p<.01

CONCLUSION

The analyses presented here lend clarity to a number of aspects of the Hospitality scale, an environmental indicator of social capital. First, although school hospitality is related to social support and social experience (non-victimization), it is associated with these constructs to a limited degree. In general, students feel at home who report having more support from teachers and more support from close friends. The subscale *I Make Others Feel at Home*, a more active notion of hospitality, is not associated at all with adult-related social support and is only weakly associated (and negatively so) with peer-related social support. This subscale has no direct association with social experience, as seen in the trivariate analysis, but develops a significant association with it in the multiple regression models. Further, Hospitality, especially *I Make Others Feel at Home*, is related to other school climate measures, such as Normative Beliefs About Aggression and Sense of Safety. This appears to confirm that Hospitality is not a measure of social support or social experience, but reflects a broader sense of feeling welcomed in the school environment.

Second, the full scale and the two subscales vary considerably among schools, suggesting that the reports from students in those schools are not randomly distributed, but reflective of actual differences in the school environments. Analyses with additional schools, where hierarchical linear models can be used and can include a broader array of environmental characteristics, may provide better understanding of the between-school variability in Hospitality level.

Finally, what do the current analyses tell us about the nature of a Hospitable school? There is enough difference between the two subscales to conclude that they are measuring distinct aspects of a hospitable school environment. For the more passive notion of Hospitality (*I Feel at Home*), the hospitable school environment is one in which Normative

Beliefs About Aggression reflect less social acceptability of aggression, students feel physically safe, and students also behave less aggressively towards each other. Aggregate social experience, in terms of being verbally or physically victimized, does not indicate that a school is more or less Hospitable. From the multiple regression analyses, two aspects of social support may be added to this formula: a Hospitable school environment is one in which aggression is limited and in which social support from teachers and close friends is high.

Thus, the *I Feel at Home* subscale appears to describe environments where aggression is held in check and physical safety is assured, where there are clear expectations about the acceptability of aggression, where, consequently perhaps, students express less aggression, and where students feel supported by teachers and close friends. Because of the manner in which these data were collected, the social support and aggression hypotheses could not be examined in one model, but such a future analysis would perhaps be a productive next step to understanding what more precisely helps students feel most welcomed in their school environment.

For the more active form of Hospitality (*I Make Others Feel at Home*), the hospitable school environment is one in which students show little acceptance of aggression, but, surprisingly, have students reporting a lower sense of physical safety. This finding was seen both at the student and aggregate school levels. In both cases, the *I Make Others Feel at Home* subscale was negatively associated with support from close friends and positively associated with verbal victimization.

We posit that where students report dampened feelings of safety, less social support from friends, and more verbal victimization, students are either more aware of the need to reach out to other students, or simply behave in such a way more frequently. Such behavior may be actively encouraged by teachers and administrators because of special safety issues, or be a way for students who are not well-accepted by friends to cope with what may be elevated social isolation. Arguing against the former possibility is the finding that support from teachers has no association with this subscale; arguing against the latter is the finding that support from classmates has no association with this subscale. Further study is required to grasp whether these findings relate to environmental factors (such as teachers and administrators facilitating prosocial behavior) or individual factors (such as students responding to being somewhat socially isolated).

Together, the two subscales measure important aspects of social capital in school. Although the subscales seem to reflect very different forms of social capital, the fact that they are very highly correlated with each other indicates that they are best employed together, as a single scale, or as we have done here as two subscales. This analysis has sought to define more fully the meaning of each of the subscales, and has done so to some degree, but this should not overshadow the interconnectedness of feeling at home and being willing to help others feel more at home at school.

Three additional lines of research are suggested by the current chapter. First, a hierarchical linear regression would help more clearly identify environmental and individual factors in terms of social support and Hospitality. While we argue here that Hospitality is an environmental factor, it would be useful to further articulate how it interacts with individual level perceptions of social support, feelings of safety, and so forth. An additional line of research would seek to explore over time how the Hospitable environment diffuses or exacerbates social isolation and risk behaviors. For such a study, we would need both environmental and student-level data over time. The goal would be to look at how students

adopt or do not adopt certain behaviors, depending on the school environment in which they find themselves. Finally, we would like to examine the issue of social reciprocity further using the Hospitality Scale. We have already posited that a truly hospitable environment not only makes students feel welcome, but encourages students to reach out and participate in making the environment a welcoming one for others. This line of research may help answer questions posed by this chapter, such as why schools in which students report *more* hospitable behavior also report *less* support from peers and more peer victimization. But it can also help answer broader questions, such as what schools can do to encourage more prosocial, hospitable behavior among students. With attention to these three suggested lines of work, we hope to define more fully environmental and individual-level forces affecting youth behavior, as well as both protective and risk-promoting aspects of the school environment.

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