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12. Understanding the Functioning of Social Interaction with Autistic Children

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Abstract. Autistic children have severe difficulties in social interactions and communication. The majority of studies conducted so far with these children are designed to identify what is missing in their behaviour or in their cognitive abilities that could explain their social impairment. However, relatively little research has been made analysing the actual interpersonal functioning existing with familiar partners in everyday life using methods adjusted to catch the idiosyncratic repertoires and temporal structures of specific dyads in specific contexts. Autistic children are not only very different from one another, but often fail to display, in the appropriate circumstances, social skills they may have already developed. Taking into account the high inter-individual and intra-individual heterogeneity of autistic children's social functioning and social understanding is a key in testing theoretical models linking their communication problems with circumscribed cognitive deficits.
In this chapter we first consider some limits of the existing methods used to study social functioning and understanding in autistic children, and we offer work we are conducting in our research team at Paris 5 University. We will illustrate the contribution of THEME analysis to our comparative studies on the development of communication and theory of mind in normal and autistic children. We conclude by showing the interest of the data obtained with this method for the interpretation of cognitive and social processes involved in the particular modes of interaction occurring between autistic children and their social partners.

Keywords: Autistic children; non verbal idiosyncratic repertoires; interpersonal functioning; social impairment.

Contents

12.1 Introduction

Autism, first described by Kanner [1], is a developmental disorder characterized by severe dysfunctions of social interaction and communication. It is not solely a quantitative impairment (fewer interactions and language), but a qualitative deviance (severe problems with the use of verbal as well as non verbal behaviours for communicative purposes) [2]. Even when language develops, semantic and pragmatic dimensions are usually much more affected than phonetics, vocabulary or syntax [3]. The understanding of the underlying cognitive deficits thus depends on facing the complexity of communication processes.

12.1.1 Social-communicative dysfunctions and underlying cognitive deficits

In a social-pragmatic approach, communication is considered as the use of appropriate communicative means to achieve social goals, adjusted to specific contexts. This activity involves different types of abilities. One of them, which has retained the attention of a very large number of recent studies on autism, is the development of *social knowledge*, and particularly the ability to represent interpersonal mental attitudes (*Theory of Mind*) [4, 5]. Taking into account another person's intentions, feelings, desires or knowledge is a condition for the establishment of communicative exchanges that serves more than simply instrumental purposes. Another important component of communication is the involvement of *temporal inter- and intra-regulation* of behaviours. This relies on *control and executive processes* during the course of social interactions in order to adjust the selection of context-relevant communicative means to the expression and understanding of intentions. The relationships between forms and functions of communicative acts have to be monitored, on line, in a temporal flow of constant changes [6]. Each partner of the social interaction contributes, with varying degrees, to these control processes through dynamic co-regulation processes.

Up to now, there has been a lot of theoretical work on how cognitive deficits, in either of these components (theory of mind/executive functions) could be responsible for autistic social-communicative dysfunctions [7-9]. However, very few studies investigate these relationships directly, testing precise operational predictions derived from such models. According to mind-reading deficit hypothesis, as far as theory of mind develops in autistic children (by therapeutic intervention, or by compensation processes through experience), their communicative functioning should improve. If executive dysfunctions impair more widely the activation/guiding of appropriate social behaviours and knowledge in various interpersonal contexts, then the former prediction should be at least partially disproved. Even if autistic children do acquire some pertinent social behaviours or understanding capacities, difficulties should persist in using them within various communicative exchanges. Moreover, problems may be more salient when theory of mind is involved, but may also extend to instrumental interpersonal relationships.

Consequently, testing the links between theory of mind and social functioning in autism requires making several important distinctions: a) the evaluation of *competences vs*. the evaluation of *performances*; b) the coding of *forms* (behavioural components, intra-personal and interpersonal temporal structure...) *vs.* the coding of *functions* of communicative behaviours (social goals they intend to serve). Such a pragmatic approach has been relatively rarely adopted.

In earlier studies, the attempts to answer these questions have been hindered by several methodological problems which we consider in the next section.

12.1.2 Evaluating social functioning and theory of mind in autistic children: methodological problems

12.1.2.1 Social interactions

A first limitation in current research on autistic children's social interactions is the relative scarcity of studies that directly observe and investigate children's functioning in naturally-occurring, everyday interactional settings [10-12]. A majority of studies provide information on indirect observations obtained through the use of clinical inventories/checklists with parents or teachers [13, 14]. Although theses procedures are not very time consuming and are helpful in the establishment of diagnostic, they tend to overemphasize what is lacking and dysfunctioning, while little is revealed about what does function more or less adequately, whether it comes from typical or vicarious processes of development. When direct observation tools are used [e.g.15, 16], most of them focus solely on measuring the child's social behaviours, and rarely take into account the interactive dynamics between the child and her/his partner(s).

A few studies do integrate measures of interactivity, but they come up against two types of difficulties in their application to autistic children. Some authors use *predefined categories,* generally based on normal development framework, thus searching for typically coordinated structures of interaction that are characteristic of different developmental stages (e.g. "joint attention", "social referencing" [17, 18]). This method may not only prove hard to apply (such structures are often only partially present), but possibly omits idiosyncratic or hidden structures that might exist when interacting with an autistic child. For this reason, other studies choose to *detect empirically* the occurring behavioural combinations through correlational or sequential analysis [16, 19] but still may fail to catch the underlying structures of interactivity: correlational approaches miss real-time organization, and sequential analysis need to define time windows between related behaviours, thus neglecting idiosyncratic response intervals (delayed, or differed after other unrelated behaviours). Another type of problem concerns the application of standard quantitative data analysis to subjects with developmental disorders. Comparisons are usually made between groups (autistic *vs.* controls with typical development of other handicaps), with the resultant difficulty of choosing the relevant matching variable (chronological age? verbal or non-verbal mental age? developmental level in a more circumscribed domain?), and of interpreting comparisons based on means statistics. Mean level of social functioning has indeed very little sense with autistic children, standard deviations being often higher than mean values. They reflect extreme inter-individual variations, which may be greater within group than between groups, and high intra-individual sensibility to contexts variables (e.g. structured/unstructured situations [20]). The characterization of autistic children's social functioning thus requires alternative methods of data analysis, better adjusted to the identification of internal regularities in their interactional repertoires implemented within specific contexts.

12.1.2.2 Theory of Mind (ToM)

While there is a certain theoretical agreement on the idea that autistic children's disabilities in attributing mental states underlie their peculiar socio-pragmatic functioning [4, 5], theory of mind (ToM) is usually not tested in real and familiar interactional situations. Most studies use experimental tasks, measuring metacognitive knowledge through commentaries (predictions or justifications) about the behaviour of figures in fictitious stories. This has two main drawbacks. First, such tasks cannot be easily applied to young or low-functioning autistic children. Secondly, they evaluate capacities of social understanding/reasoning potential, not their actual usage in ecologically meaningful interactive situations. A series of recent studies showed, however, that autistic children

who pass ToM tasks still have important difficulties in interpreting mental states in everyday communicative situations [21, 22]. Thus, complementary methods of assessment are needed in order to investigate the reasons for this apparently paradoxical finding: autistic children seem to show poorer ToM capacities in social situations involving real interpersonal motives and familiar partners than in experimental contexts. Differences in the requirements of regulation processes could play an important role. Developing methods adjusted to the analysis of ToM application *in vivo* is an important issue, and a first step would be to identify, through the flow of naturally occurring social interactions, when and how ToM is more likely to be activated. The selection of relevant episodes in observational *corpora*, as well as the behavioural coding systems used, should thus be guided by an attempt to index functional markers allowing to distinguish interactional sequences that are more likely to request mentalistic capacities, from more elementary exchanges in which behaviour manipulation is sufficient. In our research team, this approach has been adopted in two complementary directions: a) the elaboration of social interaction behavioural grids, applicable to various contexts, in which some behaviours are indexed as potential ToM markers (e.g. clarification request, joint attention attempt, non literal use of a behaviour or statement such as teasing, irony, etc.); b) a focus on more specific interactive contexts that may particularly solicit the participants to draw from their ToM resources (such as oppositional episodes), and an extensive structural and functional analysis of interpersonal strategies followed by the social partners involved. Given these conceptual and methodological considerations, the questions about the links between ToM and social functioning can now be reformulated more precisely for empirical testing:

a) *Is ToM level measured in experimental tasks predictive of social functioning quality in real life?* Is it related to the functional quality (mentalist vs. instrumental) and/or to the structural quality (behavioural coordination and temporal regulation) of social interactions?

b) Where and how is ToM likely to be activated during real life interactions? Are there specific structures that organize mentalistic exchanges? Are they specifically disorganized in autistic children?

12.1.3 Interest of THEME program for the study of interactions involving an autistic child

The use of a computerized program such as THEME [23, 24] seems to be an interesting opportunity to explore some of the methodological difficulties reviewed above. First, this method is open to detection of unexpected or non conventional structures of interaction, in terms of *content* (behavioural elements and combinations) and of *time* duration and intervals. Second, the algorithm of patterns detection is independent of the coding system, and is not constrained by presupposed links between forms and functions of behaviours, whether in terms of time intervals, succession or co-occurrence of elementary events. Third, it is based on the detection of statistical regularities that are intrinsic to the segment analysed, allowing the identification of individualized rather than "mean" interactive repertoires, more suitable for taking into account the high heterogeneity within and between subjects . Finally, such a program could be a useful tool for investigating the place and role of ToM requirements in the flow of naturalistic interactive moves. In particular, it could help to analyse whether there exist some specific structural characteristics in patterns which regulate social exchanges that are more demanding in mentalistic competences.

12.2 Research illustration

Data presented here are part of a larger project. The first part has been published elsewhere [25] and will be only summarized here, in order to present the next step, in which THEME

program was used. The central purpose of this project was to determine whether the level of success of children in experimental ToM tasks would predict the quality of their social functioning in naturalistic interactive contexts, as measured by communicative functions (part 1) and interactional structures (part 2). A developmental and comparative approach (autistic *vs.* normal) was adopted.

12.2.1 Part 1- Summary of method and findings

12.2.1.1 Subjects

Participants were 14 autistic children aged 5 to 12 years, and 14 normal children matched on verbal mental age (Vocabulary test [26]), aged 3 to 6 years. This range of developmental ages was chosen because it covers a period of critical progress in ToM in typical development. Autistic children were all diagnosed by experienced clinicians on the basis of international criteria (DSM-IV and ADI-R, [27, 28]). They were recruited through the Psychopathology Unit for Children and Adolescents at the Robert Debré Hospital in Paris and through an organization called the SESSAD (Service d'Education Spécialisée et de Soins à Domicile), specialized in the evaluation and guidance of autistic children. None of the autistic children was reported to have associated organic pathologies. Normal children were recruited in Paris schools. All children had at least one sibling.

12.2.1.2 Method

All children were observed in two types of situations:

a) A *developmental battery* of *Theory of mind* experimental tasks derived from classical tasks of the literature [29]. Sub-tests investigated the understanding of different mental states (perceptions, emotions, and cognitions), from implicit to explicit knowledge, corresponding to developmental levels from 1 to 8 years. Children were individually tested at the hospital (autistic) or at school (typical children).

b) *Videotaped samples of spontaneous familial interactions*, filmed at home, in familiar contexts with the usual partners (meals and play, with parents and siblings). Results presented here are based on systematic coding of meal episodes (25 first minutes *per* child).

Films were first submitted to a functional analysis, recording the frequency of children's communicative acts classified in four pragmatic categories: 1) *instrumental* (attempts to manipulate the other's behaviour- e.g. request action, object, permission; positive response; negative response...); 2) *mentalistic* (attempts to share or manipulate another person's mental states - e.g. direct attention, request/provide information, clarification, argument; comments; deny; lie...); 3) *evaluations* (e.g. positive/negative evaluations of objects, actions, events...); 4) *other* (e.g. echoes a statement; undetermined function). Codings also rated the presence or absence of gaze towards partners, and whether the communicative act was initiated by the child or produced in response to the partner's solicitation.

12.2.1.3 Main findings

In concordance with previous research [21, 22], autistic children were found to be impaired in both experimental ToM and mentalistic communicative measures when compared with normal children matched on verbal mental age. However, the profiles of the more advanced autistic children (verbal mental age - VMA: 5 to 8 years) present remarkable similarities with those of younger normal children (VMA: 3 to 4 yrs). This probably does not reflect a simple delay in the emergence of at least some mentalistic capacities, because qualitative abnormalities persist in autistic children's ToM usage (e.g. use of eye contact). But despite deviant processes of acquisition, the progression could follow more general developmental constraints, a fact that is often masked by comparative group studies.

Results moreover confirmed that experimental ToM level is less systematically linked to effective communicative functioning in autistic than in normal children. Autistic children with the highest ToM scores still use a majority of instrumental communicative functions in everyday social interactions.

12.2.2 Part 2: Contribution of THEME to structural analyses

12.2.2.1 Subjects

Since we found that verbally advanced autistic children more resembled younger normal children than they resembled children matched on VMA, we chose to present results of structural analyses on 2 subjects (one autistic/one normal), showing the most similar profiles on both ToM measures and distribution of communicative functions.

This contrast places the autistic child in an apparently more advantageous position than the normal child regarding development of formal language (vocabulary: 6 yrs *vs.* 3; 6 yrs) and experience (chronological age: around 8 yrs *vs.* 4 yrs). However, at functional level, they're more closely matched than in the majority of studies of this type. It can be noted that the autistic child still presents inferior rates of spontaneous mentalistic communications than the normal child. Table 12.1 presents the characteristics of these subjects.

Subject	**Chrono -logical age**	**Verbal mental age**	**Scores on experimental ToM Tasks**				**Distribution of Communicative functions in natural contexts**			
			Total (max=24)	Perceptions (max=8)	Emotions (max=8)	Cognitions (max=8)	Instrumental	Mentalistic	Evaluations	Other
John ***autistic***	7;11	6; 0	12	6	5	1	68,5 %	20,4 %	9,3 %	1,8 %
David ***normal***	3;11	3;6	15	7	5	3	46,3 %	41,5 %	7,3 %	4,9%

Table 12.1 Subjects characteristics

12.2.2.2 Method

We used the same films as above, and submitted them to a second type of coding adjusted for the purposes of a dynamic structural analysis: behaviours were coded in all interactants (child and partners), and more fine-grained categories were employed, both for form and function. The behavioural grid (Table 12.2) was derived from our earlier work [30, 31]. For the specific purpose of this study, more functional codings in relation to theory of mind were introduced. A specific category was added for pragmatic functions (instrumental *vs.* mentalistic), coded independently from the category of behavioural forms.

Moreover, additional potential «ToM markers» were rated: whether an explicit term designing a mental state had been used; cases when behaviours are produced «non literally», with an intention clearly different from the apparent overt behaviour (teasing, pretending, irony, prosody, etc.); cases when the topic of co-reference is not present (past or future event, object, etc.) and must be represented.

We also quoted each time a verbal production was not clearly understandable, because it was frequent in autistic children, and could elicit explicit demands for clarification of intention from the social partners.

Actor	Target child; Mother; Father; Brother1; Brother2; Sister1; Sister2; Other
B_E	Begin; End
Canal	Non Verbal; Vocal; Verbal
Behaviour	Look; Manipulate; Take; Give; Touch; Point to; Emotion+; Emotion-; Approach; Go Away; Stereotypy; Hit/slap
Focus	Object; Other Object; Action; Event; Face
Addressee	Target Child; Mother; Father; Brother1; Brother2; Sister1; Sister2; Other
Function	Asking (*Types*: Object; Action; Permission; Information*; Clarification*); Direct attention*; Provide information*; Comment*; Deny a statement*; Lie*; Threaten*; Explain/Justify*; Response+ (agree, accept); Response- (refuse, protest); Prevent action; Evaluate+; Evaluate-; Echo reproduction; Self-regulative statement; No response (when expected)
ToM markers*	Psychological term (*Types*: Emotion*; Desire*; Cognition*; Perception*); Non literal behaviour (*Modality*: Behavioural, e.g. tease/pretend*;Verbal, e.g. irony*; Vocal, 2nd degree prosodic mark*); Not present (evocation of past/future)*; Not understandable

Table 12.2 Behavioural grid used for structural analysis. (*ToM specially required)

Principles of the analysis with THEME program [23, 24] will not be detailed here since they are presented in the first chapter of this volume.

12.2.2.3 Results

Patterns quantitative characteristics: Figures 12.1, 12.2 and 12.3 present the distribution of T-patterns detected in interactions with the autistic and with the normal child by length, level and degree of interactivity. Longer and higher levels of T-patterns were found in behavioural episodes involving the autistic child than the normal child. This apparently surprising finding is illuminated by the third figure. For the autistic child, patterns are mostly of low interactivity (single child patterns). Keeping in mind that the behavioural grid includes very elementary aspects of behaviours (such as «touch», «look», «approach», etc.), and that they compose many of the T-patterns, the increase in T-patterns' length and level may reflect mainly the existence of more repetitive intra-individual structures of behavioural combinations in the autistic child.

Patterns qualitative content: Figure 12.4 presents T-patterns that have been detected for the *normal child* and account for the majority of the interactive course, with the following parameters: minimum of occurrences = 3, $p < .005$.

The total number of T-patterns detected, after redundancy reduction, was 12. These are mostly T-patterns of alternative looks between the child and the partners (father and sister), during instrumental interactions, the father trying to control children's behaviour during meal.

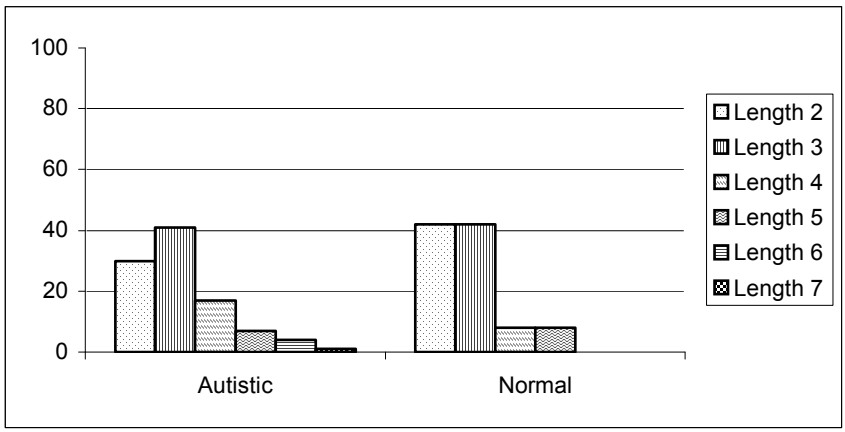


Figure 12.1 Percentage of patterns by length and type of subject

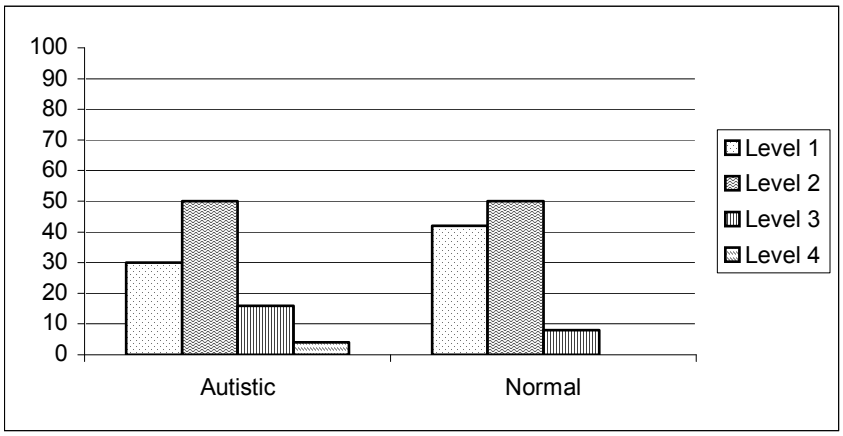


Figure 12.2 Percentage of patterns by level and type of subject

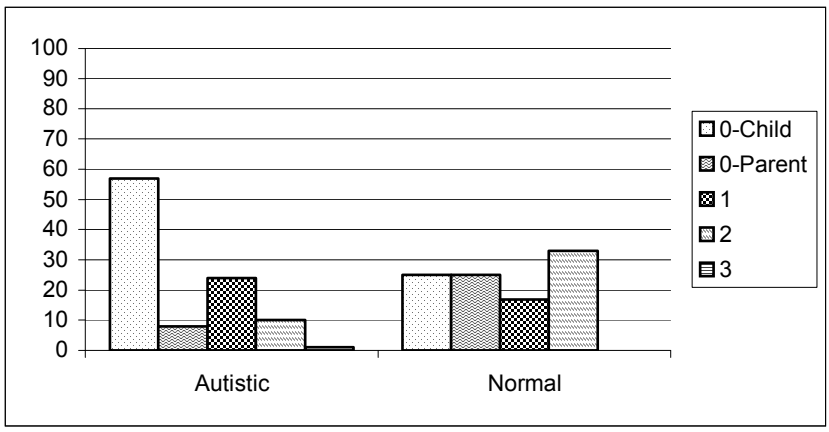


Figure 12.3 Percentage of patterns by degree of interactivity and type of subject

Figure 12.5 shows the T-patterns that have been detected for the *autistic child* and account for the majority of the interactive course, with the same detection parameters (minimum of occurrences = 3, $p < .005$). The total number of T-patterns detected, after redundancy reduction was 179.

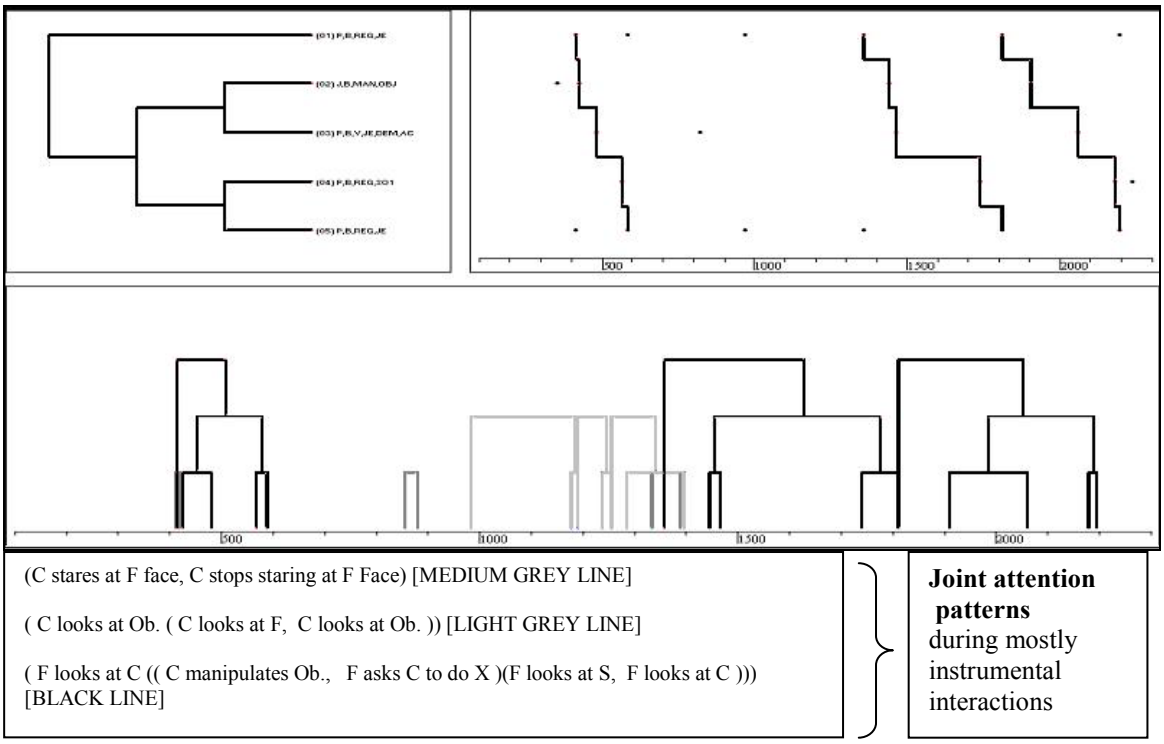
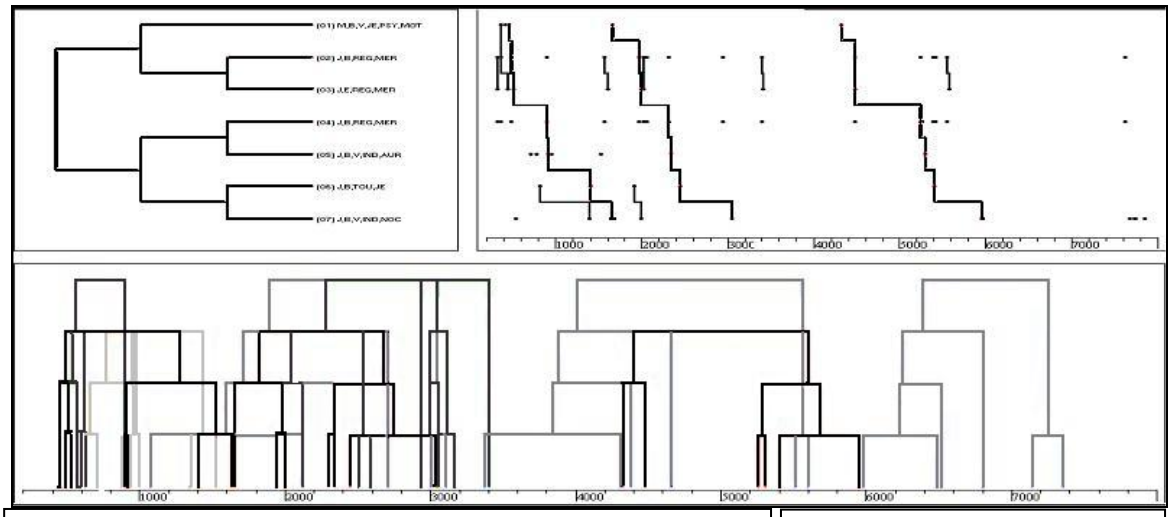


Figure 12.4 Detection of T-patterns in a normal child (aged 3; 11) (min occ. = 3, $p < .005$). (Total Nb. = 12, max. length = 5, ma12. level = 3). C= Child; F= Father; Ob= Object;

From the analysis of the content and meaning of the T-patterns detected emerge the following findings:

- A very large part of the T-patterns (65%) were composed of behaviours from a single actor (57% child, 8% mother)
- The most complex or long interactive patterns reveal unadapted exchanges (example A). Despite an explicit request from the mother that the child clarifies his intention (solicitation of mentalistic capacities), the child is unable to do it clearly, although he is able to speak with perfectly intelligible words or whole sentences.
- Some T-patterns reveal typically autistic structures (example B): poorly coordinated behaviours (gaze/verbal-vocal), self-centred behaviours, alternance of approach/ withdrawal. Some of these child patterns could be communication attempts that fail.
- mother T-pattern (example C): the longest patterns including only the mother are often attempts to understand, supervise and control the children, while she is serving the dinner.
- Although behaviours indexed as ToM markers had been coded in the autistic child, they almost never appeared in T-patterns detected. Only ToM markers associated to partners' behaviours appeared in T-patterns.

Because autistic children are known to have more difficulty engaging in conventional interactions, we wondered if the parameter of a minimum of 3 occurrences for the detection of T-patterns was not too high for them, at least for the detection of T-patterns with higher levels of interactivity. Figure 12.6 thus presents the results of THEME analysis for the autistic child, with a lower minimum of occurrences (2), but a more stringent threshold ($p < .001$). We found an important increase of the number of T-patterns detected (n= 1179 after redundancy reduction), of their maximal length (20) and level (11).The content analysis of the more complex T-patterns shows that there is an entanglement of adapted interactions (Fig. 12.6, example 6.a) and unadapted exchanges (Fig. 12.6, example 12.6.b).



((M asks what C wants (C looks at M, C stops looking at M))((C looks at M, C verbalizes self regulative statement)(C touches own body, C verbalizes -not understandable, undertermined addressee))) [BLACK LINE]

((((C looks at M, C verbalizes -not understandable, undertermined addressee) C approaches Ob)(C looks at Ob, C goes away from Ob)) C looks at M) [DARK GREY LINE]

(((C vocalizes, C verbalizes self regulative statement)(C touches his face, C stops touching his face))(C vocalizes, C verbalizes self regulative statement)) [LIGHT GREY LINE]

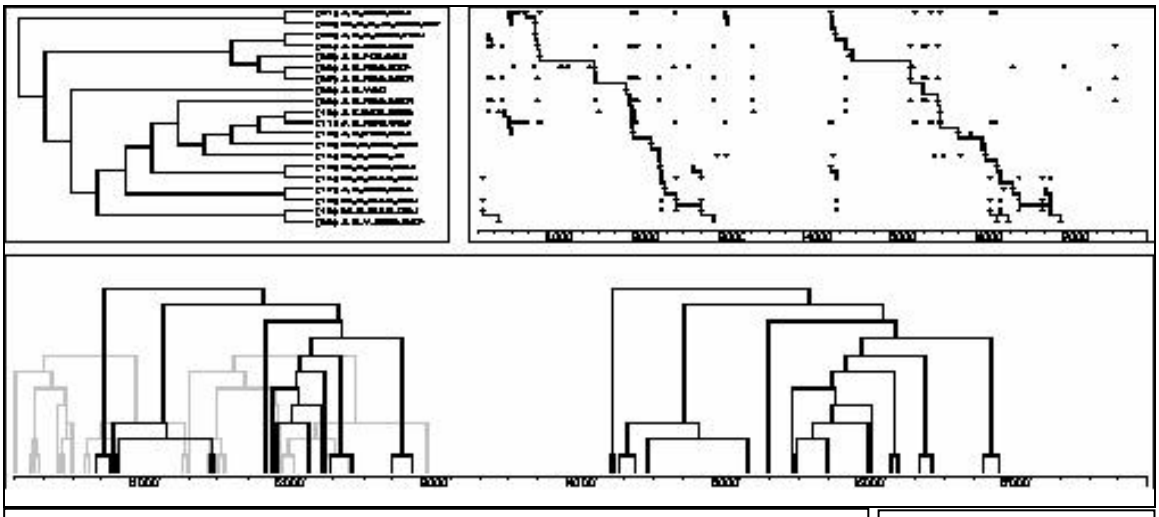
((((M asks C clarification, M takes an Ob) M manipulates Ob) M looks at C)(M manipulates other Ob, M looks at C)) [MEDIUM GREY LINE]

Example A : UNADAPTED EXCHANGE, unclear expression of intention, despite explicit asking for clarification by mother

Example B : TYPICALLY AUTISTIC PATTERNS
(Failed communicative attempts ?)
CHILD PATTERNS

Example C: MOTHER PATTERN

Figure 12.5 Detection of T-patterns in an autistic child (aged 7;11, VMA= 6;0) C= Child; M= Mother; Ob= Object.



(C. looks at an object, M asks information to C)(((C. gives information to M., C. looks at M)(C.points object (C. looks at Exp., C.looks at M.)))(C. vocalizes ((((C. looks at M.((((C. looks at M, C. looks at object) C. touches object) S. looks at Exp) M. approaches C.))(M.looks at object, M. manipulates object))(C.looks at other object, M. manipulates object))(M. manipulates object C. verbalizes positive response to M.))))) [BLACK LINE]

((C. approaches M.(((C. approaches M., C. looks to M.)(C. looks to M., M. asks what C. wants))(C. looks to M. (((C. looks to M., C. verbalizes -not understable, undetermined addressee) C. touches object) C. looks to object))))(((C. looks to object, C. slaps his head)(C. looks to M., C. looks to object))(C. vocalizes, C. verbalizes -not understable, undetermined addressee))) [GREY LINE]

Example 6a: ADAPTED Joint attention and communicative exchange

Example 6b: UNADAPTED EXCHANGE, unclear expression of intention, despite explicit asking for clarification by mother

Figure 12.6 T-Patterns detection with a minimal occurrence (autistic child) (min Occ. = 2, $p < .001$) (Total Nb. = 1179, max. length = 20, max. level = 11) C= Child; M= Mother; Exp= Experimenter; S= Sister.

At the beginning of the sequence, there is a quick repetition of a T-pattern containing 16 behavioural events, in which the autistic child has problems in communicating his intentions despite the mother's efforts to make it clearer (same as in the previous analysis). But another pattern containing 20 events emerges, on a larger time scale, revealing an appropriate succession of communicative behaviours (asking/giving information, joint attention involving adapted coordination of gaze alternance, manipulations, and explicit verbal positive comments).

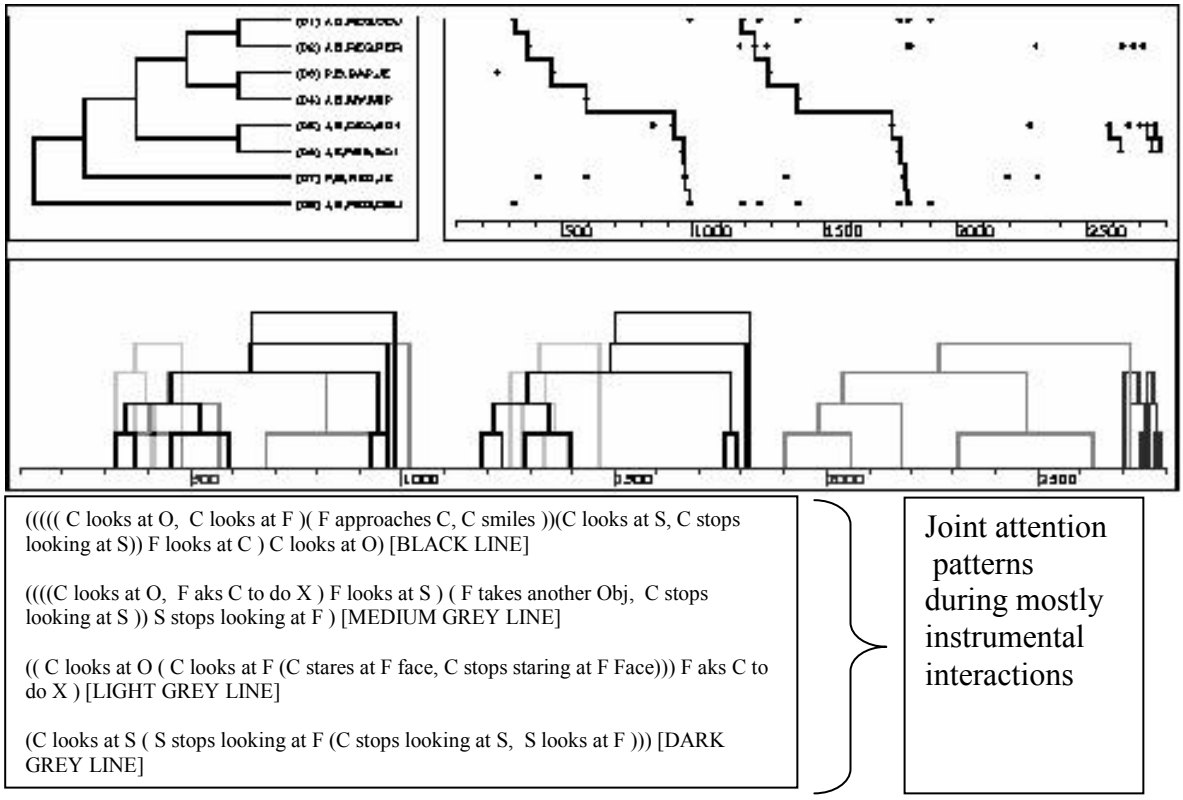


Figure 12.7 T-patterns detection with a minimal occurrence (normal child) (min Occ = 2, $p < .001$) (Total Nb. = 52, max. length = 8, max. level = 5). C= Child; F= Father; S= Sister; O= Object.

In comparison, the same analysis conducted with the *normal child* (minimum of 2 occurrences) also increases the length and levels of patterns detected, but to a much lower extent (maximal length = 8, maximal level = 5) than for the autistic child. Moreover, the qualitative content was very similar to the previous analysis (joint attention during instrumental patterns).

12.2.2.4 Discussion

Structural analyses conducted with THEME program provided several important findings. While a high number of T-patterns were detected in episodes involving the autistic child, it seemed to be linked more to intra-individual repetitive tendencies, than to high degrees of reciprocal interactive combinations of behaviours. The analysis confirmed the existence of forms/functions dissociations in the structures detected, and of difficulties in the regulation of communicative intentions (e.g. initiating, planning, maintaining, and modifying in order to be better understood). Moreover, data showed the variability of coordination and adjustment (sometimes very poor, sometimes better) in the dynamic of social interactions between autistic children and their social partners. As regards theory of mind, inappropriate selection of context-relevant communicative means for the expression and

the understanding of intentions was found even within simple instrumental communicative functions, such as asking for an object. Disregulation of control and executive processes appear to play a more general role in the autistic child's interactive peculiarities. Few T-patterns contained "ToM markers", although they occurred in events coded. When ToM markers occurred in patterns, they usually qualify the parents' behaviours (e.g. "asks for clarification"). Several interpretations could be proposed for that finding. It might be a property of "ToM markers", intrinsically linked to potentially "trap-social situations" (non literal messages, jokes, etc) and, as such, require innovative and flexible strategies. They would consequently appear in less regular communicative structures than more elementary and automaticized communicative regulation behaviours. It may also be that children from this study are not sufficiently advanced in ToM to show integrated communicative patterns including those markers. Moreover, it might be due to specific limitations of the observational context. Meal episodes may elicit more instrumental exchanges than mentalistic communications with children of this age. The extension of this kind of analyses to other contexts (especially play with adults or siblings, with a focus on oppositional episodes, [32]) will offer important information in this regard.

12.3 Conclusion and perspectives

Data presented here are only first results of a work in progress. Although there is still a lot to explore, such as peculiarities in timing structures, the exact location of critical behaviours (eye contacts, smiles, etc.) inside or outside patterns, THEME program seemed a very useful complementary tool for the understanding of social-communicative dysfunctions and functioning in autistic children. Findings were encouraging because they suggest that despite social impairments, children with autism develop relationships with others that cannot be reduced to dysfunctions or lack of social-cognitive skills. This type of analysis offers stimulating opportunities to investigate how theory of mind is implemented *in vivo*, as a function of contexts varying in executive processes demands. More generally, because it enables an individualized identification of communicative repertoires activated in specific contexts (as defined by partners and social goals), this method may contribute to both theoretical and clinical research, by offering possibilities of more precise adjustments in educational interventions to the individuals.

12.4 Acknowledgements

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