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Features of Interaction in Infant Twins

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Abstract. Twins, more than any other home reared infants, experience intimate and usually continuous interaction with an age-mate from early infancy. The effects of this situation are examined and its implications for both the emotional and cognitive development are discussed in the light of evidence from two studies in which play sessions were video-recorded and subsequently analysed into behavioural categories. The first was a longitudinal study of a single pair of twins, while the second was a short-term study of interaction and cooperation in infants in the 9 to 20 months range. Five pairs of twins, 5 pairs of familiar peers, and the children's mothers were observed playing a structured cooperative game. The hypothesis is advanced that twins enjoy more emotional support but less intellectual stimulation than singletons and it is suggested that social enrichment of the environment of twins could foster social and cognitive development.

Key words: Twins, Infant peers, Social interaction, Parenting practices, Cognitive development

INTRODUCTION

Twins, more than any other home-reared infants, experience intimate and extensive exposure to another infant from birth. This is one of the main features of what has become known as the 'twin situation'. The motivation for studying this situation has come from several sources. Firstly, an explanation is being sought for the fact that twins tend to perform less well than singletons on certain measures of cognitive performance, particularly those tapping language skills. Secondly, the capacity of young infants to interact with their peers and the effects of such interaction has gained widespread relevance since group day-care has become so common.

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In an early report Day [6] found that twins were slightly behind singletons in intelligence at the age of five and showed a much more striking delay in language development from the second to the fifth year. Day found that twins were inferior to singletons on virtually *all* language measures, including mean length of utterance and sentence complexity and they showed an overall poverty of vocabulary.

Subsequently there have been numerous reports of similar findings [12], although the developmental duration of the twin-singleton difference has given rise to widely divergent findings, some suggesting that there is a catch-up by the age of 6 [16] and others maintaining that the deficit is still present at High School entry. Certainly, the well known study of over 50,000 Birmingham children found a significant difference in Verbal Reasoning scores when the 11+ examination was written [11].

In South African research the lower performance of twins emerged from a comparison of 1,258 twins with 53,651 singletons in a study which showed that a significant twin-singleton difference was still present in 14-15 yr olds ($P = 0.001$). This finding applied not only to the Verbal IQ scale of the New South African Group Test but also to the Non-Verbal and Full Scale Scores. This study also revealed significantly poorer school performance on the part of the twins in the sample, when judged by the criteria of the number of times they had failed a standard at school [8].

Amount and Type of Interaction Experienced

The amount of interaction with adults experienced by the child has long been recognised as an important contributor to individual differences in development and the major role which the amount of speech plays in such interaction has more recently been identified in a number of widely differing investigations. White et al [15] concluded that sampling the experience of 1-year-old infants for the amount of live language directed to them throughout the day may turn out to be one of the simplest and most effective ways to assess their early learning opportunities. In an investigation of the parenting practices of twins, Costello [5] found that compared with singletons a smaller proportion of parental time was spent in playing with a twin versus caretaking activities, eg, feeding, changing and bathing. In another importan study, Lytton et al [7] showed that in a sample of twins in which the rate and maturity of speech was below that of singletons, their parents were addressing less speech to them than parents addressed to the singletons – even though in making the count speech addressed to both twins simultaneously was counted for each of them.

A parent-twins triadic interaction situation is more common than a dyadic one, for when an adult is present it is usual for both twins to be there while dyadic interactions are mainly with the cotwin. Twins therefore have to master the more difficult triadic interaction from an earlier age than singletons do. However, the feature of such interaction which Savic [13] has referred to as 'optionality' means that, because an alternate responder is always present, a twin is not obligated to respond to an adult's message and this may result in less vocal behaviour.

The aim of our own research has been to compare both the quantity and quality of parent-child and child-child interaction within twin groups and between twins and singletons.

STUDY 1: A SINGLE CASE LONGITUDINAL STUDY

A pair of identical male twins were observed and videorecorded fortnightly from the age of 8 months to 32 months in a free-play situation in a Playroom in the Developmental Unit. The unit and recording equipment have been previously decribed [1,3]. During the first half of a recorded 15-minute session, the mother was present; thereafter she withdrew and the twins played on their own in the room for the second half of the session. Analysis of the videotapes of the sessions revealed the following salient features of interaction.

a) Mother with Twins

1) Mother's divided attention. The twins' mother was faced with the dilemma of how to divide her attention in order to try and interact with both children in ways which were responsive to their individual moment to moment needs and the foci of their interests. One way in which she attempted to do this was by rapidly switching her attention from one to the other, eg, in the first three minutes of tape which was microanalysed, 26 shifts of visual attention from one twin to the other were noted. At times she also attempted to attend to both twins at the same time, eg, the record reads "Mother looks at Twin 2 while her hand is still outstretched to Twin 1".

Contrasting with this pattern, we have observed that a mother in the Playroom with only one child spends nearly the whole time focusing on the child, following her gaze, listening to her, responding and introducing new play material into the interaction at appropriate times.

2) Disruption of sustained interaction. In the second year of life the children have to start acquiring the cognitive habits of sustaining attention on a task, of directing their attention to detailed features of that task and of proceeding in an orderly fashion. Many of these skills are incorporated in activities such as building up a ring toy and in book reading with an adult, while the latter also promotes language learning. Our observation of activities such as book-reading during the second year showed that they proceed in a very different and much more disjointed fashion when two children are present. As the parent tries to engage one child's attention by pointing at a picture and naming the object or activity, the other twin frequently interrupts, tries to turn the page or is looking at a different picture from the one being named. It is extremely difficult to conduct the activity in the ideal form of a *sustained interchange* where the child can point at a picture, the parent says "that's a cat", the child attempts the word, then the parent repeats "cat", the child makes an improved attempt, and the parent reinforces and repeats, "That's right, it's a cat", before going on to point out further details of the picture. It is very difficult to hold two or more very young children's attention at the same time and give them practice opportunities and feedback. Similarly, it is very difficult to prevent disruption of construction activities such as the ring toy or building a block tower – ideally these learning situations require one adult to one child.

It seems likely that competition for adult attention and a high level of peer distraction continue to be a feature of the twins' family situation during their childhood. The negative potential of this factor may be gauged from the finding that the *length* of mother-child interactions observed at 10 months of age correlated quite highly with scores on the Illinois Test of Psycholinguistic Ability at age 6 according to Tulkin & Covitz [14]. Furthermore, in the South African study the 15 yr old twins reported

relatively more problems with reading and comprehension than with written language. As reading demands a greater measure of focused attention than written language, this problem may be related to the fact that twins in this case also reported significantly more problems than singletons in response to the question "Can you concentrate without difficulty?" ($P = 0.01$) [8].

b) Twins without Mother

In their object-centred interaction when alone as a dyad the twins showed a level of communicative competence which was no more advanced than that described by Mueller & Lucas for same-age peers. However they displayed some instances of more advanced interactive competence in non-object-centred sequences, these have been divided into two categories.

1) Distracting Consoling Behaviour. In the 27 sessions analysed, 9 instances were observed in which one twin responded to mild distress on the part of the other by carrying out an activity which appeared to have the purpose of consoling his cotwin. The earliest instance was when the twins were 43 weeks old. In this case the distracting and consoling was accomplished by banging on a table and at a later point by vocalising and also by moving into close proximity with the distressed twin. During this sequence mutual eye contact and following the other's gaze occurred more than once.

At 1 year 24 weeks an example of alternating consoling was observed when both twins were disturbed by the squeaking of a newly installed swivelling camera and each twin took a turn in consoling the other. First Twin 1 fretted, Twin 2 vocalised and ran to him. Twin 1 stopped fretting and ran his hand over a louvred panel in the door thereby making a noise. Twin 2 duplicated this behaviour but later began to fret himself when the camera made a noise. Twin 1 then rubbed the shutter again while looking at Twin 2. Twin 2 then went down on his haunches with his back to the wall and Twin 1 then did the same and they remained close to each other.

In some of the other consoling sessions when one twin looked upset the other appeared to try and distract him by giving him a toy.

It must be noted that in all these instances the consolation and emotional support offered by the cotwin were sufficient to enable the children to remain in the Playroom without an adult. We therefore concluded that the twin situation provides the high degree of familiarity necessary for reliable expectations of the peer to be developed and where this is accompanied by a strong attachment bond, the advanced type of social behaviour seen here may be developed.

2) Vocal Exchanges. As early as 11 months of age instances were noted where the twins made noises back and forth like an adult conversation although Mueller & Lucas [9] have identified this as a relatively advanced form of social interaction not usually found in peer dyads before about 18 months of age.

In a 45-second sequence recorded at 11 months, Twin 1 initiated the interaction and seemed to retain his role as the 'teller of the tale', but Twin 2 kept the exchange alive by listening, watching Twin 1, vocalising, smiling and following Twin 1's gaze thus giving it the features of a complementary interchange. However, in spite of this demonstration of the capacity of these twins to use vocal communication, their sessions with the mother absent were always characterised by far less verbal behaviour than when the mother was present. Other results from this longitudinal study have been reported elsewhere [4].

Familiarity and Overfamiliarity

In studying social interaction in relatively unfamiliar infant peer dyads, Bronson [2] reported that little interaction has been achieved before the age of 2. This has been attributed to a deficiency in peer appropriate strategies [9].

Where more familiar infants have been studied, fairly large amounts of interchange have often been reported [10]. Twins have an extensive body of common knowledge and mutual experience which forms the basis for their familiarity, but it can be argued that this represents a degree of *overfamiliarity* that leads to a reduced need or desire for verbal communication. Invoking the distinction between competence and performance, it is suggested that twins have and will demonstrate social competence, but the frequency of performance may be lowered by a reduced need or motivation stemming from their overfamiliarity and their social competence may also be displayed in different ways, eg, by the consoling behaviour described above.

STUDY 2: A COMPARISON OF SINGLETONS AND TWINS IN MOTHER-CHILD AND CHILD-PEER DYADS

Five pairs of twins and 5 pairs of familiar singletons in two age groups, 9-13 and 14-19 months, were observed while the children engaged in a cooperative turn-taking game with a hand-operated seesaw toy. Each child first played the game with its mother and then with its peer. The criterion of familiarity for the singletons was a minimum of a weekly shared playsession over a period of 3 months prior to taking part in the study. The age similarity criterion for the singletons was that the within-pair difference should not exceed 20% of the younger child's age. Each pair of infants and their mothers visited the playroom for four sessions spaced approximately a week apart. Each session commenced with 5 minutes of free play with an assortment of toys, during which time the mothers were present but did not participate. The mother was then instructed in how to play the game, ie, each player had to push the arm of the seesaw toy right down whenever it was in the 'up' position in front of him, then remove his hand while the player on the other side of the table had a turn, keeping up a steady rate of bar pressing. Child 1 then played the game with its mother for 2½ minutes while Child 2 and the researcher waited in the adjoining room, then Child 2 and mother played while Child 1 waited, after this the two infants were left to play the game on their own for 2½ minutes with the mothers nearby in case of distresses.

A transcript of all the actions in the session was made from the videorecord and was then analysed in terms of a number of categories, some applicable to all social situations, eg, smiling, while others were relevant to this particular game situation, eg, game play, ie, a downward push of the handle, in turn. A reliability check on the coding was carried out to establish both intrascorer and interscorer reliability. Categories which did not achieve at least 0.85 reliability were revised or excluded. The results of 4 interactive categories are reported in the Table. Analyses of variance were carried out to determine the contribution of the variables of mother vs peer, age, twin vs singleton.

a) Comparison of Dyads with Mother vs Peer as Child's Partner

The overall picture that emerges from the Table is one in which all four forms of interac-

tion, ie, Mutual Gaze, Smiling Together, Vocalising, and Game Playing, were much more frequent in the mother-child than in the child-peer dyads. This confirms the view that cooperative activity is facilitated and sustained by a socially competent adult.

b) Comparison of Age Groups

Both the Child Vocalisations and Mother's Speech to Child show a significant and developmentally predictible increase from age group 1 to age group 2. Interactions of other variables with age are reported below.

TABLE - Mean Frequencies of Interactive Behaviours

Behaviour	Age group	With mother		With peer	
		Twins	Singletons	Twins	Singletons
Mutual Gaze	Group 1	32.33	46.25	12.33	24.00
	Group 2	24.00	62.00	9.00	21.67
Smiling Together	Group 1	14.83	22.75	0.67	0.00
	Group 2	11.00	17.67	6.00	4.00
Vocalising (Child)	Group 1	13.33	22.75	13.50	16.50
	Group 2	23.25	47.67	14.00	29.17
Speech in words (Mother)	Group 1	391	336		
	Group 2	510	716		
Game Playing	Group 1	78.50	140.75	24.33	59.50
	Group 2	165.50	143.67	72.00	33.33

c) Comparison of Twins vs Singletons

1) **Mutual Gaze.** Mother-twin dyads displayed less mutual gaze than mother-singleton dyads ($P = 0.01$) and the same trend emerged in the peer dyads but was non significant.

2) **Smiling Together.** There was a nonsignificant trend for mother-singleton dyads to smile together more than mother-twin dyads, but a converse trend for the twin dyads to smile together more than the singleton dyads.

3) **Vocal Interaction.** The twins were significantly less vocal with mother than the singletons ($P = 0.05$). Mother's Speech count was higher for singletons than twins only in the older, ie, the 14-19 month old age group; the interaction with the age factor was significant ($P = 0.05$).

4) **Game Playing.** Here there was a significant interaction between twin-singleton status and age both in the mother-child and child-peer dyads. In both cases singletons in the younger age group did more game playing than twins but in the older group the twins had the higher score.

Thus, although the older group of twins are having less mutual gaze, smiling and vocal interaction with mother and less mutual gaze and vocal interaction with their peer, they are being just as successful as the singleton in the cooperative game played in these sessions. However, had the game task been one which depended more heavily on verbal skills, they might well have been at a disadvantage. Mother lower verbal interaction with the twins may have been due to her perception of a lack of verbal response on the part of the twins,

but may also show that she is inclined to tire of giving encouragement, instructions and reinforcement to two people and that this applies to the real life situation as well as to the experiment.

It is also important to note that the twins did not score significantly higher overall than the singletons on any of the peer dyadic interaction measures in spite of their much greater familiarity; however, they did show higher scores on a measure of 'disengagement' involving looking away from the partner, possibly due to their overfamiliarity.

The practical implications of this analysis of the twin situation for child-rearing practices, is the recognition that while the presence of the cotwin may ensure that the twin is never lonely and serves as a source of emotional support, not all the child's socially mediated needs are met by this situation. Play apart periods when each child can enjoy the undivided attention of an adult, with the contingent reinforcement and feedback which facilitate the learning process plus the rich, varied and informative verbal interchange that stimulates language development would meet some of the needs.

Furthermore, if the twin can have the stimulus of having peers other than the cotwin as playmates, this would carry the advantage of bringing a new range of interests, experience and habits to the interaction. Twins do need relationships with other people, children as well as adults, but they will bring to these new relationships their understanding of peers and of peer-appropriate strategies that has been learned in the twin situation.

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