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Do children with autism acquire the phonology of their peers? An examination of group identification through the window of bilingualism*

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ABSTRACT

Normal children whose parents have different native languages tend to develop an accent which is closer to their peers than to either parent. It was predicted that children with autism, because of their social deficits, might not acquire the accent of their peers, perhaps because of the lack of the normal drive to *identify* with peers. Bilingualism was used as a window into such social factors in language acquisition. Using audiotaped speech samples, the study found that in a sample of children with autism who were brought up in England and whose mothers were not English, 83.3% acquired their mother's (non-English) accent. In contrast, among normally-developing siblings of children with autism who were brought up in England and whose mothers were not English, only 12.5% acquired their mother's (non-English) accent. We suggest that such studies of unusual populations are of value in furthering our understanding of the larger population of children with autism, and the influences on normal social development.

Recently we observed a remarkable example of psycholinguistic development in a single-case test-tube, as it were. It concerned Sean, a normally-developing 4-year-old boy, born and raised in Hackney, close

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to the East End of London. His mother was from Northumberland (North-East England), and his father was from Dublin (Ireland). Sean, as one might guess, spoke not with the distinctive Geordie accent of his mother, nor with the gentle lilt of his father's Irish accent, but with a broad Cockney accent that was typical of his local peer group. When Sean was four and a half years old, his parents decided to move to his father's home town of Dublin. After just 2 months, we saw Sean again. In this short time, his Cockney accent had vanished without trace and had been replaced with an Irish accent that was indistinguishable from his new peer group in Dublin.

Such a transformation can teach us a lot about the relative importance of different social factors in language development. It suggests that, in the normal case, the peer group is the critical social group with which the child seeks to identify, and within which he or she tries to become relatively indistinguishable. Parents, in this regard, are of secondary importance. This pattern is widely noted. For example, we have also seen children of Asian immigrants to New York rapidly develop a New York accent, rather than the Indian subcontinent accent of their parents. While parental language clearly exerts some influences on their child's language development in infancy, this seems to take second place to peer-group influences by the preschool age.

Of course, such observations may tell us not only about language development, but also about social development, e.g., about the normal processes of social identification, and about how different social objects (parents, peers, teachers, etc.) exert pulls with differing weights on the developing child.

In the case of children with autism, a primary symptom in whom is abnormal social development (American Psychiatric Association 1987, Baron-Cohen 1988, Kanner, 1943, Rutter 1983), there is considerable interest in how social information is processed, given the presence of insults to the developing neurocognitive system (Frith 1989). Studying the pattern of language acquisition – and specifically acquisition of accent – in children with autism might help to throw light on the extent to which the impact of basic social processes might be similar to or different from the normal case. Given that autism is usually not diagnosed until school age (Baron-Cohen, Allen & Gillberg 1992), a study of accent acquisition might allow a glimpse of the impact of these different social processes from the toddler period, 'fossilized' in the older child's phonological system.

There is one major problem in adopting a research strategy of this kind. In the majority of children, normal or otherwise, the accent of the peer group and the accent of the parents almost totally overlap. For

example, most English children have English parents and English peers, making it almost impossible to disentangle whose accent is being imitated. To overcome this problem we focused on just those children who had a parent with a first language that was different from the child's. Such children allow us to separate parental influences from peer influences. In some cases, it was the mother who had a different first language from the child, and in other cases it was the father.

As well as looking at a group of children with autism who were growing up in a bilingual home, we also investigated a group of normally-developing children who were siblings of children with autism, and who were also growing up in a bilingual home. These normally-developing children were of interest because they would be receiving similar phonological input from the parents and local environment as the children with autism. We predicted that these normal siblings would possess the accent of their peers rather than their parents, while the children with autism who fail to join a peer group in the normal way (due to their social handicap) would possess an accent more closely resembling the parent who had spent the most time with them in the early years.

METHODS

Subjects

We tested 3 groups of subjects. Group 1 comprised 10 children or young adults with autism who had been brought up in England, and who had one parent whose first language was not English, and one whose first language was English. Accents of the parent of each child in Group 1 had to have an unambiguously non-English accent, as rated by both experimenters and by 2 additional independent judges from an audiotaped speech sample. Subjects in Group 1 were recruited via an advert in the National Autistic Society's journal *Communication,* and via local clinical services. All the children with autism had a clear diagnosis of autism, according to established criteria (American Psychiatric Association 1987, Rutter 1978). The languages of their parents included Polish, Spanish, Arabic, French, Dutch, Ghanaian, German, and Greek. Their Chronological Age (CA) ranged from 4–14 years old (mean = 9.2, S.D. = 2.9).

Group 2 comprised 10 normally-developing siblings of children with autism, and who also had one non-English parent and one English parent; 7 of these 10 were siblings of the children with autism in Group 1. Their CA ranged from 4–16 years old (mean = 8.7, S.D. = 3.6). Finally, Group 3 comprised 10 children with autism, both of whose

parents were English. They were randomly selected from a special school for autism in London. Group 3 was matched for CA with the other two groups, and had a mean CA of 9.2 yrs, S.D. = 3.01 (range 4–14 years). Their details are shown in Tables 1 and 2. The groups did not differ in terms of age (F (2, 27) = 0.08, p = 0.92). Finally, subjects in all groups were selected on the basis that they had audible speech, as judged by the independent raters.

Groups 2 and 3 were intended to serve as control groups for Group 1. Group 2 allowed us to control for similar bilingual[1] environmental input as received by Group 1, but where the target child had an unimpaired neurocognitive system. They also allowed us to control for any effect on parental speech that might occur as a result of having a child with autism living at home. Group 3 allowed us to control for the effects of autism in the target child, independent of whether the environmental input was bilingual or monolingual. This was because phonological abnormalities have been documented in people with autism (Tager-Flusberg 1993), making it important to have some baseline data on the acquisition of accent by children with autism under monolingual conditions.

Procedure

Parents of each of subject in Groups 1 and 2 were sent an audiotape, and were asked to record 5 minutes of conversation between the mother and each child[2] in the family, and between the father and each child in the family. The tapes were then returned to the authors, who independently rated the accent of the child with autism, of the first sibling on the tape, and of each parent. Two other judges, blind to the hypotheses of the study, then independently rated 70% of the tapes, as a measure of inter-rater reliability. All judges used the 'naked ear' rather than any formal set of acoustic characteristics, and simply made judgements, for each speaker, as to whether the accent was English or non-English, and whether the accent of a child sounded more like the accent of the mother or the father. The judges were non-linguists. Finally, the ratings of the accents of the subjects in Group 3 were made,

[1] We use the term 'bilingual' to refer to the different native languages of the parents. We do not mean that two languages were spoken at home, or that the child was being brought up as a bilingual. We simply mean that the phonology of one parent was markedly different from that of the other parent or of the child's peer group.

[2] Here, 'child' is used to mean biological child, rather than denoting a particular age-group.

TABLE 1. *Characteristics of Groups 1, 2 and 3*

Subject	CA	Mother	Father	Sounds like M?	Sounds E or N?
Group 1					
1	6	N	E	?	?
2	14	N	E	yes	N
3	11	E	N	yes	E
4	9	N	E	yes	E
5	10	E	N	yes	E
6	7	E	N	yes	E
7	11	N	E	yes	N
8	4	E	N	yes	E
9	10	N	E	yes	N
10	10	N	E	yes	N
Group 2					
1	8	N	E	no	E
2	14	N	E	no	E
3	7	N	E	no	E
4	8	E	N	yes	E
5	6	N	E	no	E
6	4	N	E	yes	N
7	16	N	E	no	E
8	8	E	N	yes	E
9	8	N	E	no	E
10	8	N	E	no	E
Group 3					
1	7	E	E		E
2	11	E	E		E
3	12	E	E		E
4	8	E	E		E
5	12	E	E		E
6	4	E	E		E
7	13	E	E		E
8	6	E	E		E
9	11	E	E		E
10	8	E	E		E

Note. CA = Chronological age; E = English accent; M = Mother; ? = Dispute between judges.

TABLE 2. *Summary Results*

Group	CA		% with non-E mother	% with non-E father	% who sound like mother†	% who sound like father†
	x	sd				
1	9.2	2.9	60	40	90*	0**
2	8.7	3.6	80	20	30	70
3	9.2	3.0	0	0	100	100

* Fisher's Exact Test, Group 1 vs Group 2, $p < 0.0095$
** Fisher's Exact Test, Group 1 vs Group 2, $p < 0.0012$
† Irrespective of whether mother was English or not
Non-E = Non-English

live, by one of the experimenters during testing at a school for autism in London, rather than from audiotapes.

RESULTS

Tables 1 and 2 show that in Group 1, 60% of the children had a non-English mother, and in Group 2, 80% had a non-English mother. In this sense, the groups were closely matched for parental accent. However, whereas only 30% of children in Group 2 were rated (by both judges) as sounding like their mother, 90% of Group 1 were rated as sounding like their mother. This difference is significant (Fishers Exact Probability Test, $p < 0.0095$).

The latter analysis of 'sounding like mother' is in some cases confounded with 'sounds like peer group', since in a few cases the mothers were English, and therefore had the same accent (English) as the peer group. Therefore, in order to disentangle these two factors, we carried out a further analysis. Table 3 shows that when only those subjects who had a non-English mother are analysed, the difference between groups remained significant. Thus, in Group 1, 6 children had a non-English mother, and $^5/_6$ (83.3%) were also rated (by both judges) as sounding non-English themselves. In contrast, in Group 2, 8 children had a nonEnglish mother, and only $^1/_8$ (12.5%) were rated (by both judges) as sounding non-English themselves. This was statistically significant (Fisher's Exact Probability Test, $p < 0.011$). Of further interest, where the father's accent was non-English, no subject in either group was rated as also having a non-English accent. Inter-rater reliability between the two independent judges was 85.7% for Group 1 and 100% for Group 2.

DISCUSSION

Using acquisition of accent under bilingual conditions as a window into early social development, this study revealed that children with autism,

TABLE 3. *Adjusted results, given language of mother, in each group*

Group	% of children with a non-E mother who sound non-E	% of children with an E mother who sound E
1	83.3% (5/6)	100% (4/4)
2	12.5% (1/8)*	100% (2/2)

* Fisher's Exact Test, $p < 0.011$
E = English; Non-E = Non-English

as predicted, are significantly less influenced by peer effects, relative to their non-autistic, normally-developing siblings. Instead, the strongest social influence on children with autism – at least as indexed by phonological acquisition – tends to be the child's mother. Fathers exert no discernible influence on the development of accent in either group. While this perhaps comes as no surprise, given that it still remains true that the mother is likely to be the person with whom the child has spent most time during early development, the pattern found in the children with autism is nevertheless abnormal. It reveals that children with autism are less sensitive to peer influences than are children without autism.

Here we consider three possible explanations for this pattern of results. First, children with autism might simply have less exposure to peers, perhaps because they have a smaller peer group, resulting in a weakening of peer influence. We know of no specific data relevant to this, but our guess is that children with autism, while mixing in a non-typical school setting, nevertheless come into contact with a similar range of peers, for example, their own siblings. We are therefore drawn to reject this first explanation. A second possible explanation is that children with autism, despite being exposed to a similar-size peer influence, might be deficient in imitation of phonology, given the suggestion of other imitation deficits in this group (Meltzoff & Gopnik 1993). Again, however, we can rule out this explanation, since it is clear that 90% of the children with autism in Group 1 sounded like their mothers, showing that they can and do imitate certain social models. Studies of echolalia also testify to impressive auditory imitation ability in autism (Tager-Flusberg 1993).

A final possible explanation is that children with autism lack the drive to *identify* with peers, unlike normal children. This explanation seems to us to be worthy of further attention. If it is correct, why should this be? To answer this question, it may help to ask the opposite question, namely why do normal children have such a strong drive to identify with peers? One reason might be that identification with a peer group leads to acceptance by that group. Certainly, there is a long history of studies in social psychology showing that similarity is the key criterion in selecting friendship (Baron & Byrne 1991). It is likely that, for normal children, being accepted by peers is of crucial importance, since the opposite could mean, at the least, being ignored by the group and, at worst, becoming a target for the group's hostility. Hence the normal drive to identify with, become similar to, and increase the likelihood of acceptance by, the group (Erwin 1993). Why might such processes not operate in the case of autism?

We know that children with autism are impaired in their 'theory of mind' (Baron-Cohen 1993), that is, in their ability to attribute mental states to others. Being either *desired* by others, or ensuring that the group's *intentions* towards them are friendly, may entirely pass them by, given their 'blindness' to mental states (Baron-Cohen 1990). This may be one reason why peer acceptance or rejection may not be as important to them. This relationship between social identification and the child's developing awareness of mental states such as desirability (Gopnik & Slaughter 1991) is of course speculative, but we suggest is an important area for future research.

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