

Imitative Interaction Increases Social Interest and Elicited Imitation in Non-verbal Children with Autism

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Recent studies indicate that being intensely imitated for a brief period of time increases social interest among children with autism. The aim of this study was to replicate and extend these findings. Twenty children with an autism spectrum disorder (ASD) were randomly assigned to one of two interaction strategies: imitation ($n = 10$) or contingent ($n = 10$). The children had little or no functional speech, and their developmental age averaged 25 months (mean chronological age = 6;5 years). Both conditions were presented with repeated sessions of a modified version of Nadel's 'still-face' paradigm (still-face/intervention/still-face/spontaneous play). The analysis revealed a significant increase of both proximal and distal social behaviours (touch and look at person) for the imitation condition, which confirms previous reports. In addition, an increase in elicited imitation, as measured with the PEP-R developmental assessment procedure, was also observed for children in the imitation condition, but not in the contingent condition. This finding extends earlier reports in that it suggests that the social expectancies unlocked by imitation also spread to tasks outside the experimental setting. Copyright © 2006 John Wiley & Sons, Ltd.

Key words: autism; imitation; social interest

INTRODUCTION

Numerous research studies have demonstrated to date that children with autism display less imitation than do typically developing children. There seems to be two major views on how to interpret this observation: either as an indication of a core imitation deficit (e.g. Rogers, 1999; Rogers & Pennington, 1991) or as reflecting wider problems with understanding the social world (e.g. Brown & Whiten, 2000; Nadel & Pezé, 1993).

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Two recent reviews give support to the view that imitation is a core deficit. One is a review of 'methodologically sound' imitation studies among children with an Autism Spectrum Disorder (Williams, Whiten, & Singh, 2004) and the other a general theoretical overview of our current understanding of children with autism (Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Both conclude that imitation presents specific problems for children with autism, and they also suggest that better ways of observing this core imitation deficit might help us to identify children with suspected difficulties within the autism spectrum early in life. Additional support for this conclusion is to be found in a study by Recheval *et al.* (2005) who analyzed imitation captured by home videos at an early age and concluded that imitation deficits are striking before 18 months of age among children with autism or suspected autism.

Support for view number two—that the imitation problems children with autism display might be secondary to a more primary social motivation deficit (Mundy & Neal, 2001)—comes from a set of studies conducted by Nadel and her co-workers (e.g. Escalona, Field, Nadel, & Lundy, 2002; Field, Field, Sanders, & Nadel, 2001; Nadel *et al.*, 2000). These are studies that have focused on imitation as an interactive and dyadic process, the results of which indicate that the low levels of imitation observed among children with autism could be due to a more general failure to understand relationships and other people. In the first of these studies, Nadel *et al.* (2000) reported that a total imitative interaction strategy, implemented within a still-face paradigm, increased autistic children's social interest in a stranger. This procedure, inspired by the still-face procedure initially developed for young infants by Tronick, Als, Adamson, Wise, and Brazelton (1978), consists of four brief phases, each lasting 3 minutes. In the first phase the child walks into a playroom that contains two sets of identical toys. An unfamiliar adult (a stranger) sits on a sofa, keeping a still-face and her body like a statue. The stranger does not move or respond at all to the child during the first phase. In the second phase, the adult imitates everything the child does (sounds, movements and actions), capitalizing on the two sets of identical toys provided in the setting. Next, a second still-face episode is implemented (phase three) and, finally, the procedure ends with three minutes of spontaneous play (phase four). Eight low-functioning children with autism participated in Nadel *et al.*'s study and the conclusion was that the procedure was successful in developing social expectancies: While ignoring the stranger in the first still-face episode, all children focused on the adult in the second still-face episode.

In two subsequent studies, Escalona *et al.* (2002) and Field *et al.* (2001) used Nadel's version of the still phase procedure to compare two different intervention strategies: (a) an imitative interaction and (b) a contingent but non-imitative interaction. They both used samples of 20 children with autism who were randomly assigned to each of the intervention strategies. During phase two (after the first still phase period), children experienced either an adult imitating everything they did or else an adult who responded contingently, but not imitatively, to each of their actions. In the Field *et al.* study the interventions and still phase procedures were administered during three repeated sessions, while the Escalona study only presented the still phase procedure once. However, the results were partly similar. Escalona *et al.* report that, during the second still face episode (phase 3), the children in the imitation condition spent less time in gross motor activity and more time being close to the stranger as well as touching her, than did those in the contingent-only condition. Similarly, Field *et al.* report that, during their third session (in the final free play episode), the children in the imitation condition increased their proximal social behaviour toward the stranger

(e.g. physical closeness and touching), while children in the contingent-only condition did not.

Taken together these studies suggest that being imitated might facilitate social expectancies among children with autism. More specifically, they give support for the argument that imitation is a vehicle for developing pro-social behaviours.¹ A few studies have noted this before among children with autism (e.g. Dawson & Adams, 1984), and some programs have included imitation as an important tool for promoting positive social change (see also Caldwell, this issue; Hart, this issue). However, surprisingly few systematic experimental or randomized studies focusing on imitation as an interaction strategy can be found in the published scientific literature.

The present study aims to replicate the findings of Field *et al.* (2001) and Escalona *et al.* (2002) in a Norwegian sample. Additionally, it investigates whether the expected positive effect on the children's social behaviours extends to imitation elicited outside the experimental paradigm. More specifically, we hypothesized that a behavioural response strategy of intensive imitation would be more effective in promoting interest in another person than would a strategy that involved only contingent (i.e. non-imitative) responses. In addition, we also hypothesized that exposure to the imitation strategy might yield more generalized improvements in children's abilities. That is, we expected that children in the imitation condition might show an increase in imitative behaviours in other settings, in this case in a formal test setting, where those in the contingent condition would not show such an increase. Therefore, we measured elicited imitation, using an instrument standard in the developmental assessment of children with autism (PEP-R; Psychoeducative Profile-Revised; Schopler, Reichler, Bashford, Lansing, & Marcus, 1990), comparing children's PEP-R scores before and after the experiment.

METHOD

Participants

Twenty non-verbal children (19 boys and one girl) with autism spectrum disorder (ICD-10; WHO, 1993). The sample had a mean chronological age of 6 years and 5 months (S.D. = 2.2; range: 4:4–12:9) and a mean mental age of 2 years 1 month (S.D. = 1.0; range 1:0–4:5) (see Table 1). Based on PEP-R scores (Schopler *et al.*, 1990), administered approximately 4–8 weeks previously for the purpose of matching and randomization, the children were individually matched for developmental level and randomly assigned to one of two intervention strategies: imitation interaction (Group IM; $n = 10$) or contingent (but non-imitative) interaction (Group CN; $n = 10$).

The children all had very limited capacity for functional communication, relying primarily on non-verbal signals (as can be seen in Table 2). One child in the IM group and three in the CN group did use some signs, and a majority could use some single words in addition to touch, gestures and non-word vocalizations (i.e. seven in the IM and nine in the CN group). Some sort of limited imitation training had been previously tried out for most of the children for brief time periods (five in the IM and eight in the CN group), but only two children (both in CN group) remained in a program where imitation was used in any systematic way.

Table 1. Chronological age (CA), Developmental age (DA) and Language age (LA) for the children in the imitation condition (IM; $n = 10$) and the contingent condition (CN; $n = 10$)

	IM		CN		<i>p</i>
	<i>M</i>	<i>S.D.</i>	<i>M</i>	<i>S.D.</i>	
CA	87.0	32.5	67.4	10.1	ns
DA (PEP-R ^a)	23.2	10.4	27.5	13.5	ns
Perceptual age	27.8	14.0	35.5	20.5	ns
Cognitive non-verbal	22.1	9.3	24.6	13.5	ns
Cognitive verbal	23.9	9.6	23.7	11.1	ns
Imitation age	19.1	12.4	26.3	13.5	ns
LA (PEP)	23.0	8.9	24.2	12.0	ns

^aPEP-R=Psycho-educative Profile—Revised (Schopler *et al.*, 1990).

Procedure

The study was carried out in a testing room furnished with a sofa, two tables and two sets of ten identical toys (umbrellas, balloons, slinkies, cups, dolls, sunglasses, hats, dolls, plates and trucks). None of the children were familiar with the setting or the procedure.

The basic procedure was based on Nadel *et al.*'s (2000) version of the classic still-face procedure (phase 1–3) with some modifications (phase 4) as outlined by Escalona *et al.* (2002). Thus, the implemented procedure (see Figure 1) consisted of four distinct phases, each lasting for 3 minutes.

1. *Still-face 1 (SF1)*: The child enters an unfamiliar room alone, where an unfamiliar adult is sitting still like a statue with no facial expressions or movements.
2. *Intervention phase*: Each child received either an imitative interaction (IM) or a contingent interaction (CN). In the IM condition, the experimenter imitated everything the child did (i.e. *all* movements and *all* sounds, including stereotypes). The aim was to immediately reflect back the child's behaviour, imitating the actions exhibited by the child. In the CN-condition, the experimenter also responded immediately to every behaviour and sound exhibited by the child, but without using an imitative behaviour. This is in accordance with Escalona *et al.*'s (2002, p. 142) description of the CN-condition. Thus, in both conditions, the child had control (albeit unknowingly) over the nature of the evolving interaction, and in both conditions the adult was responding immediately (i.e. contingently) to all behaviours exhibited by the child. The difference between the two conditions concerned the degree of 'matching' or 'reflection' that was inherent within the response. In the IM condition, children effectively received both contingent and matched responses, while in the CN condition, children received only contingent responses.
3. *Still-face 2 (SF2)*: This phase was identical to SF1. The experimenter returned to the sofa and sat still, statue-like, once again.
4. *Free play (FP)*: This last phase was meant to be a spontaneous play episode between the experimenter and the child. The adult was instructed to play as freely as possible but asked not to use imitation as a means of contact. The experimenter was allowed to take any initiative, other than imitative, which created a free and relaxed interactive climate. This greater flexibility in the nature of responsiveness distinguished this phase from the CN-condition in Phase 2.

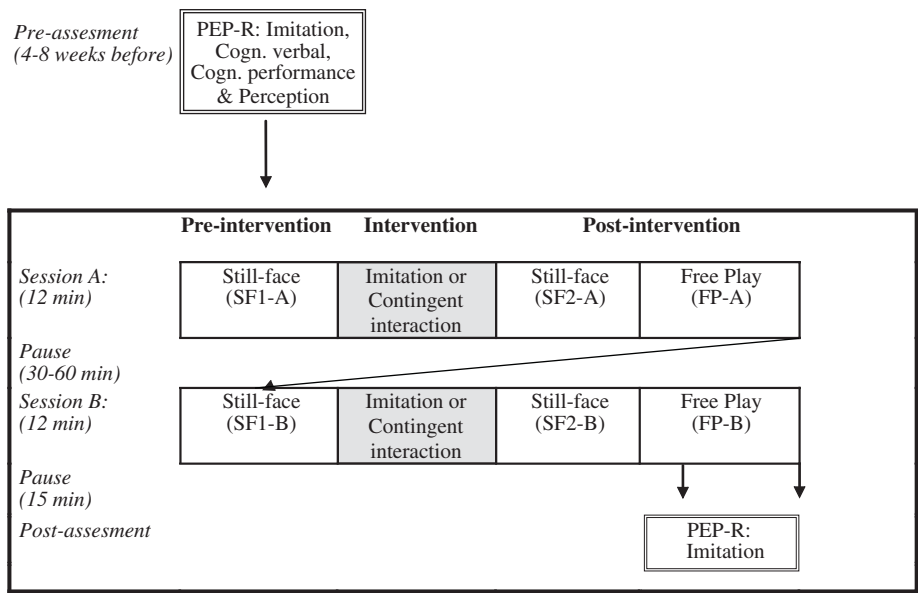


Figure 1. The overall design of the experiment: For detailed explanation of the various phases included in the sessions A and B, see Method section.

After a break, of 30–60 min, the 4-phase procedure was repeated (Session B). The procedure was identical during this second administration, with the exception that the experimenter would now have been more familiar to the children in Phase 1 (Still-face, SF1-B) than had been the case in Session A (Still-face, SF1-A). In total, each child was presented with a still-face phase four times (yielding a total of 12 min), an intervention phase two times (IM or CN, yielding a total of 6 min) and also two free-play episodes (yielding a total of 6 min).

After completion of the two sessions, the child was taken to a different room where the experimenter (re-)administered the Imitation Sub-scale from the PEP-R (see below). The complete procedure (Sessions A and B) lasted for 60–90 min (including the break).

The whole procedure was videotaped with two video cameras. One camera was mounted on a tripod and operated by a second researcher, who also signalled to the experimenter when each 3-minute phase should end. Both the camera and the second researcher were behind a curtain in one of the corners of the room, and thus not visible to the child during the procedure. The second camera was mounted on the opposite wall and primarily used as a back-up source, maximizing the possibility of capturing the child’s face during play.

Ethical considerations: Special precautions were taken since the children were completely unfamiliar with the setting, the procedure and the ‘still-face-person’. All parents had been thoroughly informed about the procedure and had given a signed consent allowing their child to participate. Each child was also accompanied to the experimental setting by his or her parent, guardian or teacher. The

adult watched the procedure on-line through a monitor fed with the video-signal from the main camera. They were told that they could interrupt the procedure immediately if necessary. This never occurred, and when interviewed afterwards none indicated that they had observed anything out of the ordinary or any signs of distress.

Measures

A coding scheme adapted from Nadel *et al.* (2000) was used to measure relevant social behaviours in the still-face and free play phases. Initially, the scheme included several behaviours that were scored for duration (thus allowing us to calculate the percentage of time each child spent within each category or behaviour during any specified phase) and organized into three broad categories:

- Proximity (caress, embrace and touch);
- Social Gestures (give, show, point, request and imitate);
- Look (look at person, look away, look at object and look at one's own body).

After piloting, the coding scheme was altered, due to the low frequencies observed for many of the behaviours. For example, embrace and caress were never observed during the still-face episodes, and give, show, point and imitate were observed less than 1% of the time. Thus, the final coding scheme only includes three behaviours:

- Touch as a proximal category,
- Look at person as distal category, and
- Request as either proximal or distal, depending on the context of the action.

We also combine all three categories to create a composite score—Social Interest.

Instrument

The PEP-R (Psycho-Educative Profile—Revised; Schopler *et al.*, 1990) evaluates learning problems of children with various communication disorders. It is commonly used for children with autism spectrum disorder. The test gives a description of the child's developmental functioning within eight different areas: imitation, perception, fine motor, gross motor, eye-hand integration, cognitive performance, cognitive verbal, and behaviour. The PEP-R was administered twice, both before and after the intervention:

1. *Estimating the developmental level:* Four of the sub-scales (imitation, perception, cognitive performance and cognitive verbal; see Table 1) had been administered prior to the experiment (4–8 weeks) in order to provide an estimate of the child's developmental level, which could be used for subsequent randomization and pairwise matching of the children. Of the two experimenters (K. L. and B. N., authors), the person testing the child on this initial occasion operated the camera during the later experimental procedures.
2. *As an outcome measure:* The imitation subscale was administered a second time, after completion of the experimental procedure. This sub-scale includes 16 items, covering object imitation, motor imitation, and sound and word imitation. It was included to determine whether imitation, as a 'skill', was affected by the intervention strategies. To avoid any effects of familiarity, the testing on this occasion was always carried out by the experimenter who

had acted as the still-face person, whom the child had only met for the first time on the day of the experiment. The results from the first PEP-R were unknown to the tester.

Reliability

The videotaped material was digitized and analysed with the Observer software package for video analysis (Noldus, 1997). All observations were coded independently by two of the authors (K. L. and B. N.). The obtained reliability coefficients (negotiated scores) for the overall categories were: 1.0 for Touch, 0.99 for Look at person, and 0.95 for Request. These scores indicate an acceptable level of reliability. In addition, two graduate students not participating in the study coded two randomly selected tapes for one of our initial categories, Social Gestures that included Request ($r = 0.83$).

Statistical Analysis

The analysis was based on non-parametric statistics for small samples. Mann-Whitney *U*-test was used for comparisons between the two groups while within-group comparisons were based on the Wilcoxon signed rank test.

RESULTS

Pre- vs Post Intervention Comparisons

The Still-face Phases

Hypothesis I—that an imitation strategy would promote greater social interest than would a contingent only strategy—is addressed by comparing the percentage of time the children display Social Interest (i.e. the sum of touch, look at person and request) in the pre-intervention still-face phases (SF1-A and SF1-B) compared with the post-intervention phases (SF2-A and SF2-B). Results are shown in Figure 2. A significant change is observed from pre- to post-sessions for the children in the IM-condition ($z = -2.29, p < 0.05$), but not for the children in the comparison CN-condition ($z = -1.17, ns$). That is, the children who had received the imitation intervention increased their social interest during the post intervention phases, while no change was observed for the children having received only contingent responses from an adult. A direct comparison between the groups revealed that, in the two still-face phases following the intervention phases (SF2-A and SF2-B), the IM-children displayed Social Interest for more than a third of the time ($M = 35.23\%$; $S.D. = 31.01$), while the children in the CN-condition spent just over 10% of their time in a similar mode of social interest ($M = 12.90\%$; $S.D. = 14.59$). This was a significant difference ($z = -1.97, p < 0.05$).

Further analysis comparing the results from Sessions A and B (see Figure 1) revealed that the aforementioned effect was only evident in the last still-face phase in the last session (SF2-B). This held for each of the three behavioural categories (i.e. Touch, Look at person and Request), as depicted in Figures 3(a)–(c). A significant increase was noted for the IM-condition during the last still-face period. In addition, a significant decrease was noted in the time spent looking at the stranger (Look at person) after the first still-face phase (SF2-A).

The PEP-R Imitation Sub-scale

Our second hypothesis—that imitation skills would generalize to other settings, as a consequence of the imitation intervention—was investigated by examining the scores obtained for the imitation sub-scale of the PEP-R. Scores for the two conditions are displayed in Tables 2 and 3. When mean scores for the groups were compared, there were no significant differences between the two conditions, either before or after the experiment. The mean score for children in the imitation condition was slightly lower than for the children in the contingent condition at pre-assessment, although this difference did not reach significance ($p > 0.05$).

However, an analysis of the change scores revealed a different pattern. Eight out of the children in the IM-condition increased their scores at the post-assessment, while the same was true for only two children in the CN-condition. This difference in change scores between the groups was highly significant ($M = 6.55$, $S.D. = 9.6$ vs $M = -0.6$, $S.D. = 2.75$; $z = -2.74$, $p < 0.01$). These findings indicate that the imitation intervention was effective in increasing children's imitation skills, at a more generalized level than within the experimental setting.

Post-intervention Comparisons

Free Play Phases

Evidence to support Hypothesis I could also be found in the free play phases. In terms of the composite Social Interest scores, there were no observable differences between the two groups during the free play phase at the end of the first session (FP-A; see Figure 4). However, the second free play phase during session B (FP-B) revealed a different pattern: children in the IM-condition spent a significantly larger proportion of their time showing Social Interest than the children in the CN-condition ($M = 33.7\%$, $S.D. = 14.6$ vs $M = 21.5\%$, $S.D. = 11.8$; $z = -1.97$; $p < 0.05$).

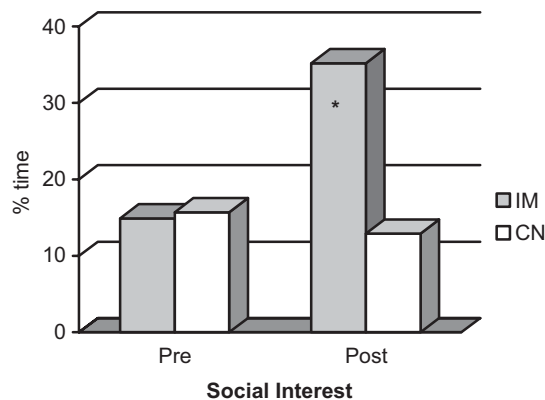


Figure 2. Percentage of time the children in the imitation (IM; $n = 10$) and the contingent (CN; $n = 10$) conditions displayed Social Interest in the still-face episodes during the pre- and post-intervention sessions (* = $p < 0.05$).

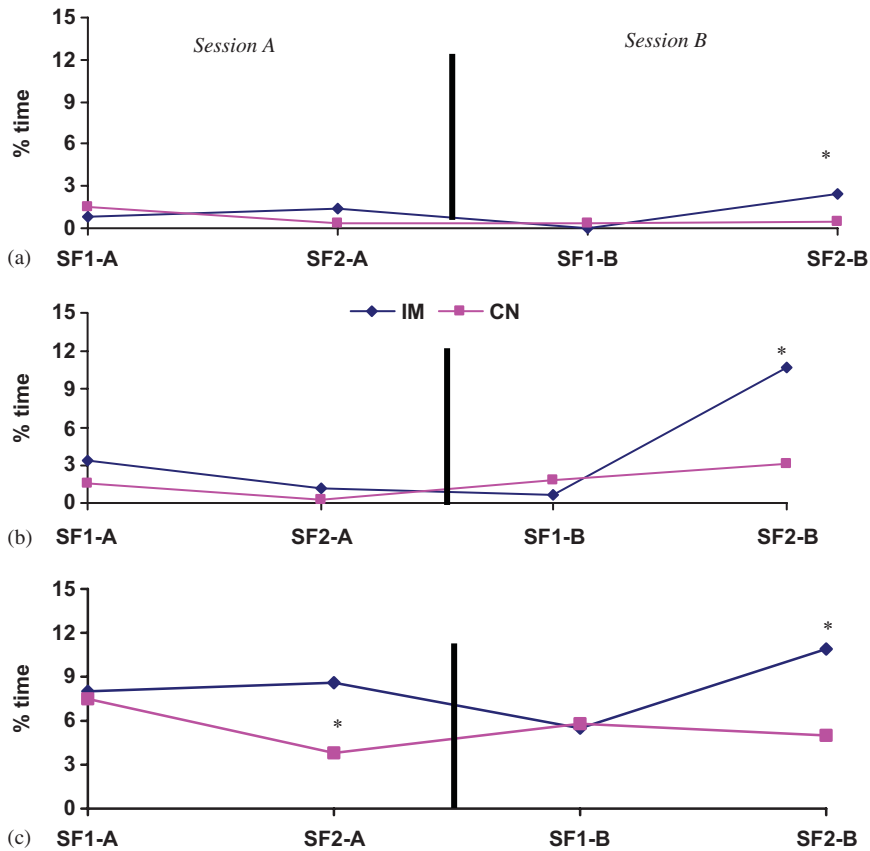


Figure 3. Percentage of time the children displayed request (a), touch (b) and look at person (c) in the four still-face (SF) episodes during sessions A and B. SF1-A and B are pre-intervention while SF2-A and B are post-intervention phases (* = $p < 0.05$).

DISCUSSION

Our results show that an intervention of a mere 6 minutes in length resulted in a significant increase of social interest among non-verbal children with autism. After experiencing a period of intense imitation, children looked more at an unfamiliar adult, and also displayed increased touching and requesting. A comparison group receiving an alternative intervention, in which children received only contingent (but not imitative) interaction, failed to show a similar change in social interest. The effect was evident for both the still-face phases following directly after the intervention phase and also the free play phases that came at the end of each session. Such results support our main hypothesis that imitation would be effective in increasing social interest. They are in line with the findings of previous studies that have investigated imitative interaction experimentally, using Nadel's still-face procedure (Escalona *et al.*, 2002; Field *et al.*, 2001; Nadel *et al.*, 2000). It also lend additional support to the notion that children react positively to being imitated as noted already two decades ago by Dawson and Adams (1984).

Table 2. The PEP-R imitation sub-scale assessed before (4–8 weeks) and directly after the intervention, as well as estimated level of communication. Individual results for the children in the two intervention conditions: imitation (IM) and contingent (CN)

Condition	PEP-R imitation score			Level of communication		
	Before	After	Diff	Sounds and touch	Single words	Single signs
Imitation						
Im1	7.5	7.5	0.0	×		
Im2	7.5	14.5	7.0	×		
Im3	16.5	21.0	4.5		×	
Im4	45.5	45.5	0.0		×	
Im5	9.5	10.0	0.5	×		
Im6	18.5	21.0	2.5		×	×
Im7	14.5	20.5	6.0		×	
Im8	21.0	32.0	11.0		×	
Im9	14.5	16.5	2.0		×	
Im10	35.5	67.5	32.0		×	
Contingent						
Cn1	14.5	14.5	0.0		×	
Cn2	10.0	10.0	0.0			×
Cn3	18.5	21.0	2.5	×	×	×
Cn4	45.5	40.0	−5.5		×	
Cn5	21.0	21.0	0.0	×		
Cn6	32.0	32.0	0.0		×	
Cn7	23.5	26.0	2.5		×	×
Cn8	40.0	40.0	0.0	×		
Cn9	12.5	12.5	0.0	×		
Cn10	45.5	40.0	−5.5		×	

Table 3. Mean and Change scores for elicited imitation assessed with the PEP-R before (4–8 weeks) and directly after the intervention ($n=10$ in each group)

Condition	Before		After		Change score		$p <$
	M	S.D.	M	S.D.	M	S.D.	
Imitation	19.1	12.4	25.6	18.4	6.5	9.6	0.05
Contingent	26.3	13.6	25.7	11.8	−0.6	2.8	ns

Of the three behaviours included in our composite measure of 'Social Interest', one might be described as primarily proximal (touch), one mainly distal (look at adult), and the final one (request) as either, depending on the context. The increase achieved through imitation seems to be carried by all three separately. That is, they each increased significantly in the group receiving the intense imitation intervention (the IM-condition). This corroborates Field *et al.*'s (2001) observation that both distal and proximal behaviours might be affected by repeated sessions of intense imitation.

Although based on two randomized groups, one needs to be cautious when interpreting the results. Children with autism constitute an extremely heterogeneous group and it is extremely difficult to create groups that are equal in mental ability, language skills and intervention history. Thus, chance factors might have affected the children's pre-intervention experience with imitation training. Fourteen children had experienced some pre-intervention training where imita-

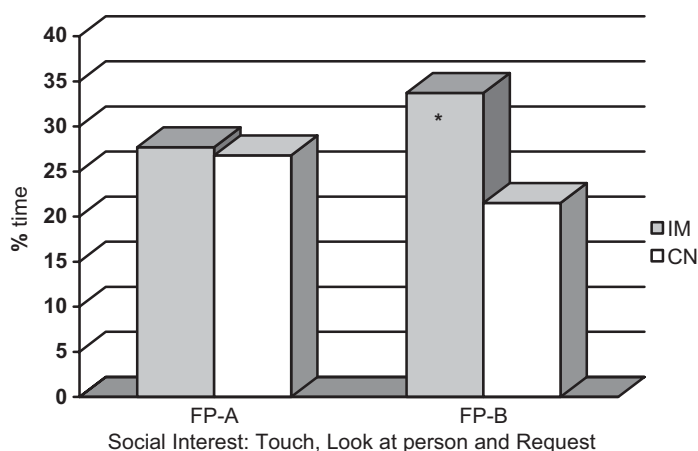


Figure 4. Percentage of time the children in the two conditions (IM and CN) displayed Social Interest (touch + look at person + request) during the first and second free play episodes (FP-A vs FP-B; * = $p < 0.05$).

tion was a central ingredient. Two of these children (child Cn4 and Cn8 in Table 2) had participated in psycho-educative programs where imitation training played a major role. However, an inspection of the data from these two children did not indicate any unusual pattern although a longer follow-up study would have been needed in order to completely rule out confounding influences.

This work has not only been able to replicate the outcomes of previous work using this paradigm (Escalona *et al.*, 2002; Field *et al.*, 2001), but to extend the findings to determine whether the effects of imitation generalize beyond the experimental setting. Our second hypothesis sought to find evidence of such a carry over effect. We suspected that an imitation intervention might increase the children's motivation to participate in social interactions, which might be reflected in a better (or more reliable) performance when tested more formally. Thus, we administered the imitation sub-scale of the PEP-R developmental assessment measure, both before and after the experiment. While the results yielded no significant differences between the mean scores for the two intervention conditions (either before or after the experiment), the change scores did show such a difference. Eight of the ten children in IM-condition increased their scores, while only two children in the CN-group displayed a similar pattern. This finding indicates that imitative interaction, as used in our intervention, might influence a child's behaviour within other settings, including formal testing. However, we do not know if this effect was long lasting or if the increased social interest that the intervention seemed to promote carried over to other types of social encounters (i.e. those not focused on imitation, as was the case with the imitation sub-scale).

Nonetheless, we regard the findings as very informative and valuable for the field. This is because (a) they are based on a short intervention (six minutes in total), (b) the results are relatively robust in spite of the small number of children, and (c) our findings replicate those of previously published studies. A priority for future work is to integrate this vein of findings with the evidence from other studies on elicited and spontaneous imitation that report deficit-like responses from children with autism (Receveur *et al.*, 2005; Williams *et al.*, 2004; Volkmar *et al.*, 2004).

The field also needs to better understand why imitation should have this positive effect. Nadel *et al.* (2000) has suggested that the experience of being intensely imitated within a dyadic interaction creates social expectancies and therefore makes the social situation more salient for the non-verbal child with autism. Thus, the social world becomes more interesting, which in turn increases the likelihood that the children will themselves offer social responses. While it is mainly speculation, the evidence from our and other studies does point in that direction (e.g. Dawson & Adams, 1984; Escalona *et al.*, 2002; Field *et al.*, 2001; Nadel *et al.*, 2000). It may be that imitation has this effect on all children, given that imitation seems to have a positive social effect already in infancy: imitation decreases gaze aversion and increases face-to-face interaction (Field, 1977; Heimann, 1989). However, the positive effect of imitation may be particularly obvious for children with autism, perhaps because it contrasts so strongly with one of their core problematic areas (i.e. lack of social interest).

Overall, our study suggests that children with autism are sensitive to being imitated. This has been previously observed by others, but surprisingly few controlled studies exist in the literature. We concur with Field *et al.*'s (2001) conclusion that findings such as these highlight the potential usefulness of imitation as a clinical or educational tool. Intense imitation, as employed here, seems to facilitate both distal and proximal positive social behaviour. Thus, repeated sessions of imitation might be an additional intervention strategy for some children with autism spectrum disorder. We suspect that the effect will be strongest for children with a low developmental age and limited spoken language. However, observations to date are at best suggestive, and we do not know yet for certain that the observed effect of imitative interaction in an experimental setting—as in our study—will be transferable to a therapeutic or psycho-educative milieu (but see Caldwell, this volume). Imitation holds out the promise of an additional intervention technique, but it needs to be further studied and carefully adapted and integrated with current psycho-educative programs for children with autism.

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Note

1. Imitation also increases pro-social behaviour among normal adults, see van Baaren, Holland, Kawakami, and van Knippenberg (2004).

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