

*CORRESPONDENCE IN CHILDREN'S SELF-REPORT:
TACTING AND MANDING ASPECTS*

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Four boys and 4 girls (3 to 5 years old) played with as many as three toys chosen from a set of six, and were then asked whether they played with each of the toys. After a baseline in which all children showed high levels of correspondence between reported and actual behavior, reports of play were differentially reinforced, first in an individual and then in a social context. Two children in the individual condition began to report play with all six toys, even though no more than three toys had been played with. When reports of play were reinforced in a group context, 5 children reported play with all six toys. When correspondence was subsequently reinforced, virtually complete correspondence returned and was maintained in a third noncontingent reinforcement condition. Correspondence and lack of correspondence were discussed in terms of self-tacting and distorted tacting or manding.

Key words: verbal behavior, (self) tacting, distorted tacting and manding, correspondence training, rule-governed behavior, truth telling and lying, self-report, children

Learning to talk is largely learning to emit verbal behavior appropriate to specific situations, according to practices of the verbal community. Despite the multiple functions of verbal behavior (Skinner, 1957), or the diversity of language games (Wittgenstein, 1953/1958), much of the analysis of verbal behavior concerns its correspondence with some state of affairs.

One important form of such correspondence is that between a person's behavior and a verbal report of it. The majority of empirical operant studies about correspondence between verbal and nonverbal behavior in children, however, are concerned with self-control or the verbal control of nonverbal behavior. The main

focus is on the behavior of the child as a listener to his own verbal behavior. Correspondence training seeks to increase the probability of a target behavior by reinforcing the joint occurrence of the behavior and its report, either in a do-say or in a say-do fashion (Israel & Brown, 1977; Karoly & Dirks, 1977, Risley & Hart, 1968; Rogers-Warren & Baer, 1976).

Little work has been done on correspondence between self-report and a child's behavior per se, independent of the effect of correspondence on a target behavior. For example, very few operant studies have assessed the child's general accuracy of self-report. In the correspondence literature, baseline measures focus upon the relation between self-report and the target behavior of interest. Often the baseline appears as the percentage of children engaging in target behavior and the percentage of children reporting the target behavior (e.g., Israel & Brown, 1977; Risley & Hart, 1968; Rogers-Warren & Baer, 1976). Because the target behavior usually occurs at low frequency during baseline, the percentage of children doing and reporting the target behavior must be low. Such measures do not show the actual general self-reporting repertoire of the children's own behavior and do not purport to do so. It is important to examine the conditions under which a child will be an accurate or inaccurate speaker, because the child's social community depends on an accurate reporting repertoire.

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Skinner (1957, chap. 5) describes how the verbal community may establish a reporting repertoire in the child, primarily through tacting. In tacting, a response of a given form is evoked by an object or event, or their properties. The task of the community in establishing a tacting repertoire in the child is to sharpen the stimulus control over a response of a given form while weakening its relation to particular reinforcers. It does this by consistently reinforcing a verbal response of a given form in the presence of a given situation, while varying reinforcement and using generalized reinforcers. In this manner, the tacting response comes to "specify" the situation for the listener.

The person's own behavior and internal conditions can also evoke tacts. When trying to evoke a response to past behavior the community supplies stimuli that narrow down the response possibilities, distinguishing the behavior to be reported from an undifferentiated background of past events. For example, a child may be asked, "What did you do at the zoo?" If the child responds with what she did at school, additional cues are likely to be supplied to limit the range of responding to that relevant to the specified past event (e.g., "Did you see an elephant at the zoo?"). Responses to one's own behavior, responses to covert behavior, responses to the level of probability of behavior, and responses to the variables controlling behavior all comprise part of a self-tacting repertoire.

Verbal responses under motivational control are mands. A response of a given form is followed by a characteristic consequence, coming under the control of relevant conditions of deprivation and aversive stimulation. Because a mand is characterized by the relation between a response form and its typical consequence, manding can be seen as "specifying" its reinforcer, as in "Give me a cookie!" Many responses, however, may share both tacting and manding functions, irrespective of their form. "I am hungry" may be a tact of internal conditions but may be emitted also because of the possibility of being provided with food.

Lying may be an example of verbal behavior that has the form of a tact but the function of a mand. In lying, behavior in tact form is instead under the control of specific consequences, because of special conditions of positive or negative reinforcement. Skinner (1957, p. 153) gives the example of a child who upon

reporting that he lost his penny is provided with another coin by a listener. The event may prove to be so reinforcing that the child may emit the same response under inadequate or inaccurate circumstances. The first "I lost my penny!" response may be a tact under the control of the event of having lost the coin. The second, however, may come under control of the consequence of having received a coin. It is then a distorted tact; having the same function as the mand "Give me a penny!"

The present study examined this process as it affects the behavior of the child as a speaker. Little is known about the reinforcement practices related to the child's report that may lead to lying. As in Skinner's example, innocent reinforcement practices can lead to undesirable results. The present study focused on the effects of reinforcing the content of children's verbalizations in a group context on the accuracy of self-report. If, for example, children see other children rewarded for the content of speech, they may be particularly prone to produce similar content regardless of its accuracy.

Because the present study is interested in the self-reporting repertoire of the child in a general sense, we modified the do-say procedure of correspondence training studies, which focuses on a child's report regarding an activity targeted for change. No specific behavior was targeted for change in this study. The child's reports covered all activities available during play-time. Baseline was designed to reflect the actual self-tacting repertoire of the children for their recent past behavior.

METHOD

Subjects and Setting

Eight children (4 males and 4 females, 3 to 5 years old) were selected from a church-affiliated nursery school on the basis of age, sex, and parental and child consent. Two rooms in the nursery school served as an experimental playroom and report room. The playroom had an area furnished with a toy display (a wooden cabinet with transparent Plexiglas doors), a child's table, chair, and stool, and a separate observation booth with a one-way mirror and mechanism for remotely locking and unlocking the toy display doors. The report room had a table and chairs used for interviewing the child and another table for displaying jars containing reinforcers.

Play Materials

Three sets of toys were used. A given set had one toy from each of six categories: people, arts, games, manipulatives, structures, and vehicles (e.g., cowboys and Indians, crayons, puzzles, play dough, blocks, and train). Sets were changed session by session; each set repeated each third session. Color pictures (10 by 13 cm) of each toy were available for use during report time. Before the first session with each set of toys the child was asked to match each picture to the corresponding toy to insure the child could relate one to the other.

Procedure

Experimental sessions consisting of a playtime and a report time were held daily, five times a week, during school hours. The child was brought to the playroom and told to play with any toy he or she wanted for as long as he or she desired, or until the experimenter said that playtime was over. The child was instructed to play with one toy at a time, returning each to the display before taking another. Toy display doors were locked remotely if a child attempted to take a second toy before returning the first. In this case, the child was also reminded after the session that each toy must be returned before taking another one.

Playtime was over when 12 min passed or the child finished playing with three toys, whichever came first. When 12 min elapsed, if a second or third toy had been out for less than 5 min, additional time was provided until the child finished playing with the toy or 5 min was completed. Limiting play to three toys balanced the number of possible accurate reports of play and reports of not-play for each session.

After playtime the child went to the next room for reporting. A second experimenter, unaware of the child's toy play, told the child that he would like to know what the child did during playtime today. He sat at the opposite side of the table from the child, held up the picture of each toy, and asked whether it was played with (e.g., "Did you play with the cowboys and Indians?"). Any clear response, whether in complete sentence or "yes" or "no" format was scored.

Conditions during playtime were constant throughout the experiment. Five experimental conditions were introduced sequentially during report time:

Baseline. In the first four to six sessions the experimenter acknowledged the child's report without commenting on its content. After reporting, the experimenter thanked the child for participating and distributed a poker chip token immediately redeemable for desired fruit, small cookie, or candy.

Individual reinforcement of reporting play. For the next six sessions (fewer if the subject missed sessions) reinforcement was contingent upon reports of play. Each report of play produced praises and a token, whereas reports of not-play had no consequences. The child exchanged tokens for edibles at the end of the session.

Reinforcement of reporting play in group. In the next four sessions, the reinforcement contingencies were unchanged, but the report was given in a group with the other same-sex subjects. The child went back to the classroom after playtime, returning for the report time when children in the same relevant group (males or females) had finished playing. The 4 children sat at one side of the table and were interviewed in a left-to-right order determined by their sitting position. After finishing the six questions to 1 child the experimenter moved to the next child. As before, at the end of the session, the children exchanged the tokens for edibles.

Reinforcement of correspondence in group. For the next eight sessions reinforcement was contingent upon the correspondence between reported and actual play behavior. Each corresponding report of play and not-play produced praises and a token, whereas noncorresponding reports of play and not-play had no consequences. This condition was the only one in which the experimenter interviewing the child knew about the children's toy play. The experimenter observing toy play had written the names of the children who played with each toy on the back of its corresponding picture, so that the interviewer could know if a child's report was accurate. Except for the changed contingency of reinforcement, the remaining experimental arrangements for this condition were the same as the previous phase.

Noncontingent reinforcement. A final session was similar to baseline, except that each child received six tokens and exchanged them for primary reinforcers prior to reporting.

Measures. Play was defined as any interaction with a toy during a session, such as touching, actively looking at, or verbalizing

towards the toy. The experimenter recorded the specific toys the children played with by session. The child's reports of toy play were counted as corresponding or noncorresponding to the previously observed play for both reports of play and reports of not-play for each session.

Reliability. A second observer recorded play behavior in eight sessions and child report in three sessions arranged across the phases of the experiment. Reliability was calculated as the number of agreements divided by the number of agreements plus disagreements. Reliability was 100% for both play and child report.

RESULTS

Picture Identification

Prior to onset of the first session with each set of toys, the children were asked to match pictures with the corresponding toys. All did so without errors.

Correspondence Data

The six responses of each child, during each report period, are represented in Figure 1 as columns of six squares. Closed squares indicate reports of play, open squares reports of not-play. Corresponding reports are in the top half of each figure and noncorresponding reports in the bottom half.

Baseline. All children had a reliable repertoire for reporting past behavior. Six of the 8 children evidenced complete correspondence between actual and reported play; 2 children (Dave and Rachel) made one or two noncorresponding reports.

Individual reinforcement of reporting play. There was considerable variability among children in this phase. Six children made one or more reports of play that did not correspond to actual behavior. Five did so in the first session. Among those 5 children, Dave and Linda (the oldest boy and girl, respectively) maximized reinforcement by consistently reporting play for the remaining sessions, regardless of actual behavior. The other 3 children (Pam, Brien, and Nicole) returned to correspondence within one to three sessions. John and Bob did not make any noncorresponding reports of play. They were the only children whose reporting behavior did not at least once make contact with the fact that reporting play was reinforced regardless of actual behavior. Without non-

corresponding reports, Bob's rate of reinforcement increased because he played with more toys per session relative to baseline.

Overall, the contingency increased reports of play. Among the 51 noncorresponding reports, 49 were reports of play. Even discounting Dave and Linda's reports (who systematically reported play regardless of actual behavior), nine of the remaining 10 noncorresponding reports were reports of play.

Reinforcement of reporting play in group. In this phase differential reinforcement of reporting play was maintained. However, reports were now given in a group context to permit observation by each child of the other children's reports and their consequences. Dave and Pam continued to report 100% play throughout the phase. By the second session, 3 other children (Bob, John, and Nicole) also reported 100% play and did so for the remaining sessions. Only 3 children (Brien, Pam, and Rachel) maintained correspondence. This condition also occasioned verbal interaction among the children and two observed instances of instructing about the contingency.

Reinforcement of correspondence in group. In this condition, reinforcement was contingent upon reports of play and not-play that corresponded to the previously observed behavior. To maximize vicarious contact of reporting with the new contingency, the experimenter began the first session of the phase by obtaining reports first from the children who maintained correspondence during the previous phases (Brien for the boys' group; Pam and Rachel for the girls' group). Those 3 children maintained correspondence throughout the phase. In the boys' group Bob's report followed Brien's and reverted to correspondence in the first session. Dave's and John's reports reverted to correspondence in the second session, preceded by two unreinforced noncorresponding responses in the previous session. In the girls' group, the same discrete reversal to correspondence in the first session occurred in Nicole's report. Linda's report took three sessions and seven unreinforced noncorresponding responses to return to correspondence.

DISCUSSION

The present study addressed the question of correspondence in children's self-report and some conditions that contribute to its distur-

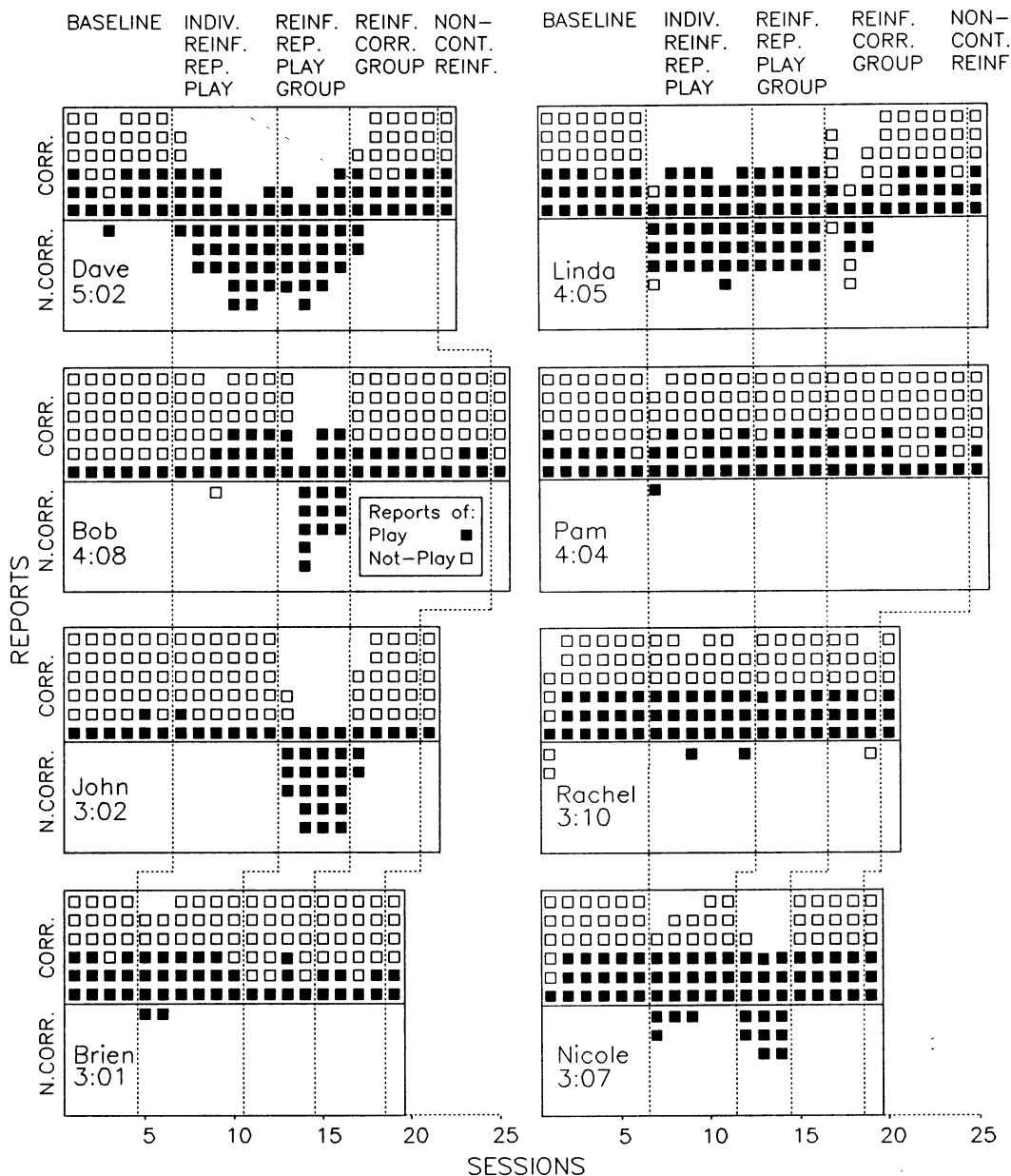


Fig. 1. Corresponding and noncorresponding reports of play and not-play across experimental conditions for each child. Closed squares indicate reports of play, open squares reports of not-play. Corresponding reports are in the top half of each figure; noncorresponding reports are in the bottom half. The children's ages appear under their respective names.

tion. To avoid variability in correspondence due to differences in vocabulary or size of tacting repertoires in children as different in age as 3 to 5 years old, we used pictures of the toys during the report time. In this manner the child could tact his or her past play be-

havior with a specific toy even if he or she could not tact or name the toy itself.

The high correspondence levels found in baseline show how accurate self-tacting of recent past behavior is in children 3 to 5 years old, under the present conditions. This level

of accuracy appears to be common, given that no effort was made to screen the children for accuracy. The development of self-report presumably begins earlier than the age of 3 years. In our pilot work using a 2-year-old boy as a subject, questions about his play behavior often instead occasioned tacts vis-à-vis the toy itself (e.g., when asked if he played with the train he responded, "Choo-choo train! Woo-woo!").

When the individual reinforcement of reporting play phase began, "excitement" may have accounted for some of the initial distortion seen in reporting, perhaps due to the elicited effects of reinforcement. It is likely that some children realized, after the fact, that they made an inaccurate report, considering that 3 of them returned to correspondence within this phase. As a reporting repertoire evolves, a possible natural consequence of accurate reporting is to permit events in the past to affect either a listener or the speaker himself. Correspondence may constitute, in this sense, a natural or automatic reinforcement for reporting that may compete with contrived consequences.

The shifting control over reporting behavior in 5 of the 8 children across the experimental conditions very likely involved both contingency-shaped and rule-governed behavior (Skinner, 1969, 1988). Rule-governed behavior involves control by antecedent events, without direct shaping by the relevant contingency. An antecedent controlling event may be formulated by another person as in verbal instruction, may be self-formulated verbally, or may have a nonverbal status as when behavior changes as a function of observing the relevant situation. For example, Bob changed from 100% correspondence to 100% reporting play in the reinforcement of reporting play condition. This reversal was preceded by Dave telling Bob, when he finished reporting in the previous session, that he had an "important secret" to tell him.

A second attempt to instruct another child was observed during a session of reinforcement of reporting play in group. Linda told Pam when she was reporting: "Say that you played! Say that you played!" Pam, however, in the next playtime session said to the experimenter that she never got the time to play with all toys like Linda did. Pam maintained self-tacting throughout.

The reinforcement control of reporting play, regardless of actual behavior, parallels similar findings in the correspondence training liter-

ature (e.g., Israel & Brown, 1977, Karoly & Dirks, 1977; Risley & Hart, 1968). However, in the individual reinforcement of reporting play condition only the oldest 2 children came under reinforcement control of reporting play. It took exposure to the contingency in a group situation to have such an effect in the majority of the children. The possibility for each child to observe the relation between behavior and its consequences in other children and the verbal interactions among the other children very likely enhanced the control exerted by the contingencies by adding antecedent controlling stimuli to the situation.

Empirical work in rule-governed behavior has shown related effects of noncorrespondence between verbal and nonverbal behavior when they are subject to different contingencies (e.g., Catania, Matthews, & Shimoff, 1982; Hayes, Brownstein, Zettle, Rosenfarb, & Korn, 1986; Shimoff, Matthews, & Catania, 1986; Verplank, 1962). It might be argued that the increase in noncorresponding reports of play during the reinforcement of reporting play in group was due to the group context per se or to the increased interval between playing and reporting, considering that the report session was delayed until all children composing a group finished playing. This possibility seems to be ruled out by the control exerted by the two different contingencies in a group context. The reinforcement of correspondence in group condition retained the group context and the increased interval between playing and reporting. Nevertheless, correspondence re-emerged. It might also be argued that noncorrespondence resulted from proactive interference. Because the children may have played cumulatively with more different toys across sessions, self-reports could increasingly be controlled by earlier reports made about toys in earlier play sessions. This is ruled out by the reemergence of correspondence in the last two conditions, because proactive interference should have been even greater in these conditions.

The main effect of the experimental contingencies can be understood as changes in the nature of the variables controlling the reporting in 5 of the 8 children studied. In baseline, reporting was primarily under the control of the children's past behavior, demonstrating a reliable repertoire of self-tacting of recent past behavior. Under reinforcement of reporting play, especially in the group situation, re-

porting was controlled mainly by the consequence of reporting play. Although maintaining the form of tacts, the children's responses essentially had manding functions. During reinforcement of correspondence it is likely that reporting shared both tacting and manding functions. That is, although reporting was now once again related to the children's past behavior as self-tacting, they could be in this form in part to obtain tokens. To the extent that self-report in this condition was due to tokens per se, the reports were mands. Finally, under noncontingent reinforcement, reporting was fully under past behavior control, regaining its primary self-tacting functions.

The issue of truth telling and lying in a generic sense involves the added control of ethical contingencies. For example, at times telling the truth may lead to aversive consequences. To account for telling the truth in such circumstances implies added controlling variables, possibly in the form of rules that "one tells the truth irrespective of consequences." Thus, telling the truth may be more complex behavior than simply producing an accurate account in a given instance. Similarly, lying is more complex behavior than inaccurate or poorly controlled responding. In lying, immediate reinforcement control (positive or negative) prevails over an already established repertoire of tacting.

Telling the truth and lying involve both contingency-shaped and rule-governed behavior. For example, at first a person may not lie due to parental or social rules. Truthful reporting may gain added control, however, upon exposure to contingencies in which lying leads to disruption of social interactions and resultant mistrust (Skinner, 1969).

The difference between tacting and manding provides the beginnings of a behavioral account of lying. In contrast, classical approaches to moral development often view children's lying as virtually unlearned. For example Piaget notes that "... the tendency to tell lies is a natural tendency, so spontaneous and universal that we can take it as an essential part of the child's egocentric thought" (Piaget, 1932/1965, p. 139). Parenthetically, a behaviorally oriented reader may be surprised by how often Piaget (1932/1965) refers to social consequences accounting for the shaping of the child's responses, as when some young children in his study defined lying as naughty words,

undoubtedly because both naughty words and lies may have similar parental consequences.

The correspondence training studies have centered upon important questions of self-control and the behavior-change implications of correspondence in self-report. The present study suggests that a behavior analysis of correspondence in self-report is conceptually enhanced by Skinner's differentiation between the verbal operants of tacts and mands and his analysis of rule-governed and contingency-shaped behavior.

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