

What Is the Meaning of Meaningful Purpose in Children's Remembering? Istomina Revisited

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In a classic study, Istomina (1977) found that preschool children remembered more items when remembering served a meaningful purpose than when it was for the purpose of reporting recall to an adult. Istomina's findings have not been replicated in several recent attempts; however, we argue that these attempts have not focused sufficiently on the purpose of remembering. We report a study in which we asked parents to present a set of pictures of 10 grocery items to their 4-year-old children (with the same order of items and number of presentations) in one of two conditions: Either, the remembering fit into a clear functional goal (making a sack lunch), or remembering was itself the goal (in a memory test). In the lunch condition, children were told that they were to remember the items so that they could get them from the "grocer" on the other side of the room in order to make a sack lunch. In the test condition, children were told to remember the items so that they could tell an adult what they were. Children remembered more items when the remembering served the goal of making lunch than when the purpose was simply remembering the items to tell someone else. We discuss the findings in the context of the other replications, some of which created fun activities to contrast with a test condition but often did not embed the remembering as a necessary way of reaching a meaningful goal. We also discuss the likelihood that across differing historical periods and cultural settings, the activities that are meaningful for young children are likely to vary.

This article examines Istomina's (1977) argument that to understand memory performance it is essential to examine the purpose of performing the memory activity. It investigates young children's remembering a list of items that they would need to tell to another person either to get materials to make themselves a sack lunch or to demonstrate their memory of the items. The distinc-

tion between remembering in the service of a meaningful goal and remembering in a test or lesson situation has remained unclear despite attempts to replicate Istomina's (1977) study. In this article, we focus on understanding and examining the meaning of meaningful purpose and its role in remembering.

THE ROLE OF PURPOSE IN REMEMBERING

Several theoretical approaches emphasize that cognitive efforts function to assist individuals in intelligent participation in activities, leading to a stress on the role of the purpose in remembering and other cognitive efforts (e.g., Bartlett, 1932; Rogoff, 1990; Wertsch, 1985). Examining the purpose of remembering has played a central role in influential Soviet research and theorizing on memory processes. The Soviet perspective goes beyond examining the depth of processing of stimuli to stress that what people do as they voluntarily remember is intimately related to the purposes for which they are remembering and the activity that motivates the efforts to remember (Leont'ev, 1981; Meacham, 1977; Smirnov & Zinchenko, 1969; Vygotsky, 1978; see also Reese, 1999). In the Soviet perspective, the purpose of remembering is central for understanding how people remember, contrasting with the emphasis on a simple scale of meaningfulness of the thought process in the depth of processing approach.

Most research on memory processes has paid little attention to the purposes for which individuals remember. However, a few empirical studies note variations in memory performance depending on the goal of the task (Skeen & Rogoff, 1987). Brewer and Dupree (1983) found that memory was enhanced when the goal of an action was known. Children's large-scale spatial memory has been found to differ according to the goals of their exploration (Gauvain & Rogoff, 1986; Herman & Siegel, 1980).

These studies do not explicitly compare memory performance when remembering serves the goal of some other meaningful purpose versus being the goal itself in a test of memory performance. As Brown (1975) pointed out, in everyday life, remembering is usually in the service of accomplishing some other goal than simply demonstrating that one has remembered. Consistent with this idea, preschoolers are notoriously poor performers in laboratory memory tests but they deliberately remember aspects of past events, locations, and names of "lost" objects when the memory tasks are embedded in meaningful activities (Nelson & Ross, 1980; Todd & Perlmutter, 1980; Wellman & Somerville, 1980).

ISTOMINA'S STUDY

A landmark study by Istomina (1977; reported in Russian in 1948) sparked interest in understanding the importance of meaningful goals for young children's recall. Istomina distinguished the purposes involved in involuntary and voluntary remembering:

If retention is the object of a special "memory" task, rather than merely a part of some other task, it then becomes voluntary, and is transformed into a special kind of internal act, i.e., into a process directed toward a particular goal, with a specific motivation and accomplished with specific operations. (p. 102)

We have assumed that the emergence of voluntary memory from earlier forms takes place as a result of the differentiation of a specific type of act, the purpose of which is to remember or recall something from among the child's overall activity. (p. 103)

Based on several studies she carried out to test these ideas, Istomina (1977; reported in Russian in 1948) reported that preschoolers' performance on a free recall task was much better when the task was embedded in a purposeful familiar activity (a shopping "game") rather than when demonstrating memory was the sole purpose (in a "lesson"). In the lesson condition, the experimenter called a child "for a lesson" and asked the child to listen attentively to the words and try to remember them, in order to recount them later to the experimenter. For the "game" situation, children participated in a game combining two themes typical in the play of preschool children—playing store and playing school. Six children and the experimenter played the game together, with three children given the roles of store employees, and three of them given roles in the "kindergarten" (teacher, cook, director). In the course of play, the kindergarten director (the experimenter) invited one of the children to go on an errand to the store to buy some things for the kindergarten and slowly named five items. The child was given a permission slip, money, and basket, and went to the store and told the store manager what she or he was sent to buy. When the child completed the purchase and returned to the kindergarten, the game continued until all the children playing in the "kindergarten" had been to the store.

Apparently, the shopping game was very popular in Russia at that time among young children (E. Matusov, personal communication, February 25, 1995). Further, Istomina (1977; reported in Russian in 1948) designed the game condition to be as realistic as possible—all aspects of the "kindergarten" and "store" play settings were constructed to be similar to the settings that children experienced in their daily life (Folds-Bennet, 1994). The critical feature of embedding the memory task in the context of an activity with a meaningful purpose was apparent from Istomina's descriptions of the play. In one example, the target child played the role of the teacher and put the dolls to sleep.

"Lyuba," says the experimenter, "when the children are asleep you can do an errand and go to the store."

Lyuba immediately jumps up and runs up to the experimenter saying: "What should I buy?" (p. 116)

In another example, the experimenter reminded the target child of his role as "cook," and set up the scenario for the task in the following way:

"Valerik," says the experimenter, "you're our cook. What are you going to prepare for lunch today?"

Valerik answers: "I don't know."

"Well then," says the experimenter, "the children are coming back from a walk and there is nothing to eat. (Valerik smiles and gazes questioningly at the experimenter.) Here is an entry permit to go to the store. Go and buy..." (she then names the items). (pp. 114–115)

As this example suggests, the game situation went beyond simply extrinsically motivating the children or providing a familiar situation. It created conditions that provided a relevant purpose for remembering the items by making remembering a means to reach a meaningful goal. Under such circumstances, Istomina argued, young children could set the goals of remembering for themselves, unlike their difficulties when simply asked to remember without a purpose that directly required remembering.

Three-to-four-year-olds already understand what remembering means. But this is not enough: they must not only know what remembering is by itself but also be able to see it as an end result, an objective to which activity must be directed, i.e., to grasp it as a goal. For this, the relationship of the remembering to the motivation giving rise to the child's activity in the first place must be apparent. However, in the laboratory test situation such a relationship is not simple and direct. In this case the goal of remembering and the operation of remembering itself do not directly follow from the specific nature of the motivation. These two factors are linked for the child only in an external fashion, i.e., remembering the words is something the experimenter interjected into his social communication with the child, i.e., into what he was doing with the child. But for the child, his interchange with the experimenter does not entail the need to recall or memorize anything. [It is in the social interchange and relationship with the experimenter that the child's motivation lies.]

The make-believe [shopping] situation is a different matter. The child assumes the role of a person sent to the store to buy groceries; in other words, he takes on the task of buying what he has been told to buy. The general motivating force of play in general takes the particular form of the motivation of the particular game: for the child to get what he has been asked to get at the store. Hence, recalling what he must get becomes for the child an intrinsically necessary goal; and the relationship between the goal and the act becomes itself an intrinsic relationship. He consciously grasps that this relationship entails the goal of remembering and thus, retrospectively, of recalling. In other words, the goals of remembering and recalling have a totally specific and real meaning in this situation. For this reason, in a play or game situation the child grasps mnemonic goals as such both more quickly and more easily [than in a laboratory situation]. (pp. 154-155)

REPLICATIONS OF ISTOMINA'S STUDY

Istomina's study aroused a great deal of interest, and several efforts to replicate her important findings have taken place in recent years (Reese, 1999; Weissberg & Paris, 1986). The closest replication seems to be that of Ivanova (1998), who reported replication of Istomina's findings at preschool ages, although the details of her study are not yet available in English.

Several other investigators have regarded their findings as not supportive of Istomina's. Our study differs from these replication attempts both in its conceptualization and in its findings. We believe that the studies that we review below, although intended to replicate Istomina's procedures, eliminated Istomina's central idea of examining the *meaningful purpose* of remembering in their efforts to improve on Istomina's procedure. These studies did not seem to retain the meaningful purpose of the play activity in their replication attempts; they seemed to focus more on the motivational effects of calling an activity "play."

We believe that the central aspect of Istomina's argument is the importance of needing to accomplish something of interest through remembering; this is quite different from whether or not the situation is playful, fun, or attractive. The distinction is whether remembering is "endogenous" to accomplishing something versus "exogenous" to the purposes of the activity, which may have attractive features. Oyen and Bebko (1996), building on the work of Lepper, illustrated this contrast with differences between computer games.¹

¹Unfortunately, Oyen and Bebko's (1996) effort to create conditions to test this contrast in their serial recall task involved complexities that make the results difficult to interpret.

Games in which the fantasy component is only arbitrarily linked with the learning content ("exogenous" games) have been hypothesized to be somewhat less effective than games in which the learning component is intrinsically interrelated with the fantasy component ("endogenous" games). An example of an exogenous game is one in which the learning task is an obstacle to be overcome in order to play an unrelated game or to display some special effect. In endogenous games, the fantasy activity is used to create a context in which the learning activity is an integrated component. In these games, the goal of the game and the goal of the learning component are directly related (p. 175).

In one of the attempts to replicate Istomina's (1977) work, Weissberg and Paris (1986) focused on examining the role of "global motivation" to account for differences in performance between meaningful and nonmeaningful task situations. They examined how 3- to 7-year-old children remembered words that were presented either as part of "pretend" shopping (the child was told by an experimenter to pretend to buy items from the grocery store and then read a list of six items) or as part of deliberate lessons (the child was told to remember the list in order to repeat them back to the experimenter). Weissberg and Paris did not find improved performance in the condition involving recall of items to pretend to purchase, and concluded that Istomina's findings were not solid and that global motivation may not be an adequate explanation. They argued that the lesson condition (standard free recall) apparently enhanced children's understanding of the goal of remembering, the need to act deliberately in order to foster recall, and a dawning awareness of rehearsal as a useful mnemonic strategy.

Schneider and Brun (1987) replicated Istomina's (1977) results but concluded that there were methodological shortcomings in her study. They obtained results similar to Istomina's (children remembered better in the game than in the lesson) when they used a close replication of her procedures, which included the possibility that children could go back to the experimenter and ask her to repeat the items. (Apparently, children felt a greater *need* to remember all items in the game condition and therefore asked the experimenter to repeat the items more often in the game condition than they did in the lesson condition.) Schneider and Brun considered this a methodological problem, and conducted a second experiment in which children were told that the experimenter would read the list only once and that they could not ask for a repetition of the list. In this version, recall differences between the game and lesson conditions were no longer apparent. (However, Ivanova [1998] reported that her results followed the pattern reported by Istomina at preschool ages, although Ivanova's replication removed the repetition of the lists.)

In another investigation, Schneider and Hasselhorn (1994) found that Istomina's (1977) results could be replicated under certain conditions, but they also concluded that methodological problems were a confounding issue. Their first experiment, which extended Schneider and Brun's (1987) study, indicated that children recalled better in a game condition. However, Schneider and Hasselhorn concluded that different behavior on the part of the experimenter in the two activity conditions accounted for these results. They claimed that "the game condition seduced the experimenters to communicate in a more friendly, motivating, and empathic way with the children than they did in the more sterile lesson condition" (p. 197). In their second experiment, in which experimenters were instructed to behave neutrally in the two activity conditions, children recalled more in the lesson than the game conditions. However, it may be that if an experimenter behaves neutrally, a situation that researchers regard as a "game" may be less likely to be regarded as such by child participants.

Recent discussions of these attempts to replicate Istomina's study have underscored the necessity for replications of classic studies, whereas acknowledging the difficulties inherent in executing exact replications. Folds-Bennet (1994), Schneider and Hasselhorn (1994), Valsiner (1994), and Reese (1999) made critical distinctions between exact methodological replications versus attempts to replicate the general model or hypothesized relationships.

The present study is a test of Istomina's (1977) hypothesis rather than a faithful replication of her procedures. Following Istomina, we investigated the significance of meaningful purposes for remembering by 4- to 5-year-old children. Although our tasks and procedures varied substantially from those used by Istomina, we designed them such that the critical feature of having the memory task serve a meaningful purpose was maintained.

Our study, rather than using a play scenario, embedded remembering in a practical activity of making a sack lunch. As Reese (1999) pointed out, most of the replication efforts have focused on play. He reported that Istomina also extended her work (in a 1953 Russian article) to remembering in a practical activity—apparently, repairing toys. She found that remembering in the service of a practical goal, like remembering in the service of a playful goal, was better than when the purpose of remembering was simply to satisfy the request of an adult to report recall.

To examine the influence of remembering being embedded in an activity as a way of achieving a meaningful goal, we compared conditions in which (a) the goal of remembering served the meaningful function of remembering items children needed to make an actual sack lunch versus, (b) the goal for remembering was to demonstrate recall by reporting the names of the pictured items to an adult. We assume that for the 4-year-old children of our study, the free recall goal is a less compelling and meaningful purpose for remembering than is remembering items to make a sack lunch. The predictions were that 4-year-old children would remember more items if remembering them served the meaningful goal of preparing to make a sack lunch than if demonstrating their memory was the goal.

METHOD

The sample consisted of 29 4-year-old children (mean age in lunch condition = 47.4 months; mean age in test condition = 49.2 months) from three preschools in Salt Lake City and from three preschools in Honolulu.² Children from each school were distributed approximately equally in the two conditions. In both cities, the samples consisted of middle-class children from preschools that were located close to universities. The Salt Lake children were primarily of European-American descent; the Honolulu children were of diverse ethnic backgrounds as is typical in Hawaii (including mixed European, Asian, Hawaiian descent). The 14 girls and 15 boys were distributed approximately equally in the two conditions; each child participated in only one condition.

A parent of each child presented the items to be remembered in both conditions, so that these young children would all be in a comfortable situation. The parent presented pictures of 10 items to their children, labeling each picture as they showed it: cheese slice, napkin, apple juice, bread, crackers, paper plate, grapes, cookies, plastic bags, and corn chips. The colored pictures of the items were cut out from grocery store advertisements, mounted onto 3" × 3" pieces of cardboard, and laminated. In the lunch condition, 14 children remembered in order to accomplish a motivat-

²There were no systematic differences between the two samples.

ing goal in the context of a meaningful activity—to remember items to be requested from the “grocer” to actually prepare a sack lunch; and in the test condition, 15 children remembered for the sake of reporting what is remembered, as in a laboratory free recall task. The items that the children in the lunch condition requested and “bought” from the “grocer” were real grocery items.

Children were tested individually in an empty room in their preschool by one of their parents (usually the mother). The entire procedure was videotaped. The research assistant (who later served as the “grocer” or as the person to report the remembered items to) played with the child in one corner of the room while the parent was given the instructions for task presentation. Both conditions held constant the specific items, the number of presentations (two), and the order of pictured items in the set. Parents were instructed to explain the task to the child using their own words and then to follow a consistent procedure to present the items: Keep the set of pictures face down in a pile, pick each picture up one at a time in the order in the pile, and show it to the child and label it once on each of two rounds of presentation. The researcher who explained the task to the parents also modeled the pacing (about 5 sec per picture) and the presentation of the items for the parent, and asked the parents not to elaborate on the procedure; they were told that in presenting each picture they should only name the pictures.

In the lunch condition, parents were instructed to ask the children to remember the pictured items so that they could get them from the assistant (the “grocer” at the “pretend store”) so that the parent and child could make a sack lunch together. After the two presentations, the children went across the room and asked the “grocer” for the items, which were stored behind the storefront counter and were not visible to the children. After listing remembered items, the child received the actual items that had been recalled and took them back to the parent. The number of items recalled at this time was the child’s recall score. To ensure that the children got all the sack lunch items, they then returned to the “store” to get any forgotten items and then the parent and child put together the lunch for the child to take home as a treat. Thus, in this task, remembering served the goal of getting items to make up a sack lunch with the parent, and the request to learn the items was explained to the child in terms of this meaningful purpose for remembering.

In the test condition, the parent was asked to explain that she was going to show the child a set of pictures that the child would have to remember and then go to the adult at the other corner of the room and tell her the pictures she remembered. When the children were through recalling, the adult gave the child a packed sack lunch with the actual items, although the children had not been led to expect this.

CODING

The child’s *recall score* was the number of items recalled during the first “shopping” trip to the “grocer” for the children in the lunch condition and the first recall to the experimenter in the test condition.

In addition, as a *procedural check*, we examined the videotapes to determine whether there were differences in how the parents presented the task, although they were instructed to present the items in a standard procedure. We examined four aspects of parent and child activity:

- The total number of times the parent referred to the need to remember.
- The sum of five types of mnemonic strategies provided by parents during item presentation: linking items to child’s personal preferences or experience (e.g., “Chocolate chip cookies are your favorite, aren’t they?”); linking items to each other (e.g., “We need the cheese to eat with the

crackers") or to the lunch theme (e.g., "We need to have some dessert for our lunch, so let's have grapes"); elaborating the function or utility of the item (e.g., "We need napkins to wipe our faces"); and modeling or suggesting remembering strategies (e.g., "See the pictures in your head"). Since the frequencies of each strategy used were low, a total score combining all five strategies was used (5 strategies \times 10 items \times 2 presentations = maximum score of 100).

- Parental encouragement of child's participation during item labeling. Parents were asked to show and label each picture to the children, which we coded "parent labels." If parents explicitly asked the child for labels ("What is this?") or deliberately paused or used a questioning look as they presented each item, these requests were coded as "parent prompts labeling" (maximum coded was once per item).

- Children's labeling of items. Children's labeling in response to parents' prompts as well as their parroting of their parents' labels were coded as "child labels in response" (thus, the frequency of child labels in response could exceed parental prompts to label). When children labeled spontaneously in the absence of any verbal or nonverbal cues from the parent (i.e., before the parent provided or prompted a label), it was coded as "child labels spontaneously" (maximums coded were once per item for either responsive or spontaneous labeling).

All the sessions were coded by one coder, with 18% of the sessions also coded by a second coder for reliability on the ways that the dyad handled the task. The average percentage agreement was 86% for parent refers to the need to remember, 82% for the parents' provision of mnemonic strategies, 90% for parental prompting of labeling, and 91% for child labeling.

RESULTS

We first report the children's recall in the two conditions varying the purpose of remembering. Then we examine whether the parents' and children treated the two conditions in the standard fashion in the presentation phase.

Purpose of Remembering

Preschoolers remembered more items when making a sack lunch provided a meaningful purpose to the free recall task than when the purpose was simply to report the remembered items. In the lunch condition, children remembered an average of 5.3 items ($SD = 1.5$) whereas their counterparts in the test condition remembered an average of only 3.7 items ($SD = 2.1$), $t(27) = 2.32$, $p < .03$. This finding supports the main hypothesis of the study, replicating Istomina's (1977) results.³

³ Levels of recall in our study appear somewhat higher than in Istomina (1977) and most of the replication studies, perhaps due to procedural differences such as our provision of pictures of the items along with naming them in two presentations of a larger pool of items. Out of 10 items, children in the lunch condition remembered an average of 5.3 and the children in the test condition remembered 3.7. In several studies, children only heard the list of items: In Istomina's primary study, the comparable means were 3.0 and 1.5, respectively, out of 5 items; in Ivanova's (1998) replication, the means were 3.1 and 2.4 out of 5 items; and in Weissberg and Paris' (1986) study, the means were 2.8 items in the "shopping" condition and 3.5 items in the "lesson" condition out of 6 items. Schneider and Brun's (1987) 4-year-old children recalled an average of 1.6 to 3.6 items out of 8, depending on the conditions. In Hasselhorn and Schneider's study (1990; reported in Schneider & Hasselhorn, 1994), in which 8 items were read and presented visually in Experiment 1, 4-year-old children recalled 3.5 to 5 items; when 5 items were either read or presented verbally in experiment 2, recalls were 1.4 to 1.9 items.

A Check on Parental Presentation of the Task and Child Involvement

Although the parents were asked to use a standard procedure, they might have varied in implementation. We examined whether parents helped their children by reminding them of the need to remember, providing specific mnemonic strategies, or prompting the child to be actively involved in labeling the pictures as they were being presented. In addition, we examined the extent to which the child labeled upon prompting or spontaneously. (Data for part of the session for 1 dyad was missing due to mechanical problems in videotaping, hence the following analysis is based on 28 of the 29 dyads.)

Parent reminds child to remember. Occasionally, parents in both conditions emphasized the mnemonic goal in introducing the task or during item presentation; there were no significant differences between the two conditions. In the test condition, parents emphasized the mnemonic goal an average of 0.3 times ($SD = 0.7$), as in the following example:

"I'm going to show you the pictures and I'm going to tell you what they are (pause). And you try real hard to remember so you can go and tell Jamie (research assistant) what you saw. Okay?"

In the lunch condition, parents emphasized the mnemonic goal in the context of the activity of making a sack lunch an average of 0.1 times ($SD = 0.3$), as in the following example:

"We need to go to the grocery store and get things for our lunch first. So you need to remember the things we need for lunch. ... [Later,] And we need baggies, so you have to remember to get those at the store or we'll be sunk."

Parental provision of mnemonic strategies. Parents also occasionally provided some mnemonic strategies, although they were instructed not to do so. However, this was rare and not significantly different between conditions. Out of a possible score of 100 (2 presentations of 10 items with 5 possible strategies), the parents in the lunch condition provided mnemonic strategies an average of 0.9 times ($SD = 1.4$) and those in the test condition provided mnemonic strategies an average of 1.9 times ($SD = 4.5$). Thus, a few parents did not follow instructions not to assist, but the rarity of this help in both conditions suggests that it is not responsible for the differences in children's recall between the lunch and test conditions.

Parents' and children's labeling. Parents were asked to show each picture and label it for the children, but in both conditions, they provided less than the 20 labels that would have been possible had they labeled each item for each presentation (averaging 13.2 items labeled in the lunch condition, $SD = 6.9$, and 10.4 items labeled in the test condition, $SD = 7.7$; not a significant difference). Parents sometimes appeared to attempt to get children to label by using subtle nonverbal strategies, such as deliberately pausing as they showed the picture; however, this did not differ significantly by condition. Parental prompting for labels occurred on average 7.1 times ($SD = 7.1$) in the lunch condition and 8.3 times ($SD = 7.5$) in the test condition.

Children in the test task labeled in response to their parents' prompts (or parroted their parents' labeling) more often than did children in the lunch task ($M = 8.4$, $SD = 6.1$; lunch = 3.7 , $SD = 4.5$, $t = 5.3$, $p < .03$). Recall scores did not correlate significantly with children's labeling in response to parents' prompts in either condition ($r = -.26$ in the test condition and $-.20$ in the lunch condition).

Children's spontaneous labeling of items before the parent labeled or prompted labeling did not differ across the two conditions ($M = 5.6$, $SD = 5.2$; lunch = 5.4 , $SD = 7.2$). However, in the test condition, children's spontaneous labeling correlated positively with recall ($r = .45$, $p < .03$); in the lunch condition, the relationship was in the same direction ($r = .30$) but was not significant, perhaps because children in the lunch condition were generally near the ceiling of recall performance.

For most of these procedural checks, differences were not significant but parents' and children's straying from the standard procedure was at least as great in the test than the lunch condition. Thus, straying from the standard procedure to provide greater assistance seems not to account for the primary finding of higher recall in the lunch than the test condition.

DISCUSSION

Results indicated that when the free recall task was embedded in a functional purpose (getting items to make a sack lunch), 4-year-old children remembered more items than when the purpose was to remember the items to report them to an adult (as in a laboratory or school test). We cannot rule out the possibility that identifying the items as related to a lunch theme in a test situation would be sufficient to improve the children's recall, without the purpose of remembering the items to make a lunch. (In our study, the children in the lunch condition had the lunch theme pointed out to them explicitly, whereas those in the test condition did not.)

However, we interpret our finding that 4-year-old children remembered more items in the lunch-making than in the test condition as providing a conceptual replication (Valsiner, 1994) of Istomina's (1977) hypothesis that young children's deliberate remembering first emerges in activities with meaningful purposes, in which the memory goal is endogenous to the activity. In our lunch task, children were provided a functional purpose for remembering because the remembering goal was embedded in the activity of making a sack lunch with the parent. In contrast, in the test task, the purpose for remembering was not embedded in an activity in which the remembering goal would seem to be as compellingly endogenous to the task. Our findings that children remembered more items in the lunch-making task than in a test support the notion that the process of remembering is related to its purpose in the activity in which individuals engage.

What Is Remembering for a Meaningful Purpose?

Different interpretations of the key contrast in Istomina's (1977) study may underlie the differences between Istomina's studies (and our replication) and those of Weissberg and Paris (1986), Schneider and Brun (1987), and Schneider and Hasselhorn (1994). In our interpretation and test of Istomina's hypotheses, we focused on embedding remembering in an activity with a compelling purpose. This went beyond just setting it in a "game-like" exogenously motivating context; children were asked to remember the items to be bought from the store so that they could make a sack

lunch together with their parent. We believe this task was like Istomina's task in that the remembering task was functional, although it was not procedurally the same task.

In Istomina's study (1977; and Ivanova's 1998 replication) as well as ours, the remembering task served a meaningful endogenous purpose—to get groceries within the context of the roles children were playing in Istomina's shopping game (and in Ivanova's replication) and in our lunch-making.

Evidence of the meaningful purpose of the task in Istomina's study (1977) is apparent in an example of one child who listed the items needed to the store manager and added, "And hurry, because the children are hungry" (p. 118), suggesting that for him the task of buying groceries fit his purpose as "cook" to enact his part of preparing the food for the kindergarten children. Similarly in our study, comments made by several children in the lunch condition indicated that getting real things from the store to make lunch was a salient feature of the task. For example, one child asked with excitement, "Is this what we're going to eat for lunch?" when his mother was presenting the items. Another commented, "That's a lot of lunch" as her mother went through the list. One 4-year-old child made sure she understood the situation by asking, "Do you get to take the food home?" and other children also commented, often with much pleasure, on the fact that they would "get to take the things home."

In contrast, although the goal of remembering in the Weissberg and Paris (1986) "shopping" situation was embedded in a familiar "pretend" activity, the task of buying groceries itself was not made functional in the pretense. The experimenter simply asked the children to play a game and go to the "play grocery store" (a "store counter" with a variety of play food items and a cash register) to buy a list of six items. The children heard the list of items, then went to the "play" store and asked for the items from someone other than the person who read them the list. Using play money, children then paid for the play grocery items that they remembered and returned to the experimenter. However, there was no other purpose for "buying" the items beyond that of responding to the experimenter's request. Presumably, the children did not get to keep the items, either. Thus, perhaps, the task still did not have a meaningful purpose for the children, especially since the pretend activity only involved "play" with an experimenter (which may not have been a convincing play situation). Hence the conditions may have made the activity somewhat familiar and fun, but might not make remembering functional.

Similarly, Schneider and Brun's (1987) replication of Istomina's (1977) study also focused on manipulation of the "game vs. lesson" contrast, rather than on making the remembering goal functional. Even in their first experiment, which they claimed was a replication of Istomina's procedure, they did not embed the shopping task in an elaborate pretend game as Istomina did. The child was asked to play a "game" with the experimenter and her adult friend. In this game, the experimenter asked the child to go on an errand, read the child a list of eight items once, and then gave the child a purse with toy money and a shopping basket. The child went over to the pretend store, asked the experimenter's assistant for the items, paid for the items they remembered, and returned to the experimenter. Thus, whereas the activity was presented as a "game," the purpose for remembering did not go beyond responding to the experimenter's request to go to the pretend store and purchase the items.

Folds-Bennet (1994) offered a similar critique of Weissberg and Paris' (1986) and Schneider and his colleagues' replication efforts, stating that in efforts to standardize methodology, they not only failed to create the rich game context that Istomina (1977) created, but they sterilized their game conditions to the point that the meaning may have been lost.

Historical and Cultural Aspects of Young Children's Participation in Lessons

Situations in which children remember for the sake of accomplishing a meaningful goal (such as playing store or making lunch) have been treated as easier for young children, in Istomina's work and in our own study, than having to marshal voluntary memory in order to demonstrate recall for an adult. However, historical and cultural differences may force revision of the claim that remembering in order to perform for an adult is necessarily an arbitrary or relatively meaningless activity for young children.

To explain the difference in results between Istomina's (1977) study and their own, Weissberg and Paris (1986) suggested that historical and cultural differences could account for better recent performance in the lesson condition. They speculated that there were broad contextual differences between the Soviet children of the 1930s or early 1940s in Istomina's study and the testwise children in U. S. preschools in the 1980s. They argued that middle-class children are now familiar with deliberate memory tasks and requests from adults to remember, through the influence of television and preschools. Whereas Istomina reported that the children in her study often seemed bewildered in the "lesson" task, children who are frequently tested in activities that adults label as "games" may in fact treat being tested for adult evaluation as having a *meaningful* purpose—demonstrating what one remembers for adult inspection!

The importance of historical and cultural aspects of free recall are supported by Ivanova's (1998) replication of Istomina's procedures with Russian children. Ivanova reported that Russian children's recall scores were higher in all conditions in her study than in Istomina's, over half a century earlier. In addition, Ivanova noted that the beginnings of use of voluntary memory strategies such as rehearsal to support remembering in the "lesson" condition occurred in children a year younger than in the earlier study. Even Ivanova's 3- to 4-year-old children were able to understand and participate in the mnemonic goal of a laboratory test (although not as well as in the shopping game)—a notable change from the confusion shown by Istomina's 3- to 4-year-old children over a half-century earlier.

The cultural and historical interpretation fits with Istomina's stress on the relation between school participation and voluntary control of mental processes such as remembering:

The psychological demands placed on a child entering school for the first time of course involve more than personal motivation; they also require that certain particular mental processes be developed. ... An analysis of the particular demands placed on the child's mind by schoolwork discloses one general requirement common to all of them, one, moreover, that is the most important of all: the child must have voluntary control over his mental processes. He must be able to guide his perception, which means that he must have the ability to concentrate; he must be able to structure his speech consciously and to control his motor behavior; and he must be able to remember and recall at will. (pp. 156–157; see also Skeen & Rogoff, 1987)

Since the 1930s and 1940s, in many nations, efforts to teach children school subjects in an academic fashion have been pushed earlier and become prevalent for a larger proportion of young children for greater amounts of time. Indeed, a great deal of research with young children involves recruitment from preschool settings. The increasing prevalence of schooling in the lives of the young children who serve as research participants may be a part of the explanation for improvements in some young children's recall-upon-demand in test situations.

The Enduring Importance of Consequential Learning

Across historical periods and cultural practices, children's familiarity with particular activities (such as learning to remember for adult inspection or different types of play) undoubtedly varies. Nonetheless, the distinction between remembering in the service of accomplishing something that makes sense and remembering for arbitrary reasons remains an understudied aspect of children's memory development.

The distinction has great practical importance for those who aim to help children learn. Many researchers and practitioners are currently exploring ways of working with children's interests and motivation to assist their learning in school and out. This can be seen in efforts to increase the "authentic" and "minds-on" learning that occurs in schools (Rogoff, Goodman Turkanis, & Bartlett, 2001) and the growing interest in informal settings for learning such as museums and voluntary activities. These issues are crucial for youth whose families and communities do not have long experience with school practices, and also for current efforts to go beyond superficial learning to aid children's conceptual understanding (National Research Council, Committee on Developments in the Science of Learning, 1999).

The complications in conceptualizing what meaningful or motivating activities *are*—seen in the various attempts to replicate Istomina's (1977) classic groundbreaking work—can be instructive for efforts to create what we call *consequential learning* opportunities for children. Just as schoolpeople struggle with the difference between "hands-on" and "minds-on" activities for children, we have argued that researchers have put children through the motions of "intrinsic" motivation by creating fun activities but need to attend to the purpose of the mental activities in the goals of the activity. For both research and practice, we argue that Istomina's emphasis on mental activities that are means to achieve goals that make sense are central to consequential learning.

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