Perceptual and Motor Skills, 2010, 111, 2, 447-457.

PRESCHOOLERS' KNOWLEDGE ABOUT THE APPEARANCE OF PROPER NAMES[1, 2]

KATHRYN MAYCUMBER STEWART AND ROBERT PASNAK

George Mason University

Summary.—Preschoolers' knowledge of the appearance of proper names was tested in three experiments with 25 boys and 22 girls from low-income families. Children from a Head Start program, whose parents signed a permission letter, participated. Their ages ranged from 3 yr. 6 mo. to 5 yr. 6 mo. (M = 52.2 mo., SD = 4.9). When shown consonant-vowel-consonant trigrams such as Rit or baF or dEg with various capitalization patterns, the children showed a tendency to recognize that CVC trigrams with the first letter capitalized or all letters capitalized were the ones most likely to represent a person's name. When their own names were substituted, which typically contained more than three letters, their performance was markedly better. Children also had a strong tendency to consider trigrams of Latin letters as more likely to be a person's name than trigrams of non-Latin characters (e.g., Sanskrit).

When young children begin to develop an understanding that writing conveys information, they must first recognize the kinds of forms that letters take. Recognition requires knowledge of the kinds of marks or symbols that look like letters. Lavine's early work (1977) showed that even three-year-olds were 70 to 100% accurate in differentiating forms that did not resemble letters from letter-like forms and real letters, and that 4-, 5-, and 6-year-olds progressively improved in differentiating letter-like forms from real letters.

When children try to produce their own letters, the sequence is similar. Scribbles and small shapes—irregular oblongs, ovals, and polygons—may represent the first stage of writing, termed "graphic" (Levin & Bus, 2003; Levin, Both-Devries, Aram, & Bus, 2005). Letter-like forms and real letters follow. In a cross-cultural study, Levin, *et al*. (2005) found that there was a gradual improvement over the age range they studied (2 to 5 years), and that children's writing was most advanced when they were trying to write their own names. The latter finding reflects those of Bader and Hildebrand (1991), who also found that preschoolers were more prone to write the letters of their own name from left to right, with fewer reversals than with letters of the alphabet in general.

[1]Address correspondence to Robert Pasnak, 3F5 George Mason University, Fairfax, VA 22030 or e-mail (rpasnak@gmu.edu).

[2]This research was supported by Grant R305B070542 from the Cognition and Student Learning Division of the Institute of Education Sciences. The opinions expressed are those of the authors and not the institute. The authors give special thanks to Finley M. Stewart, and are grateful for the gracious cooperation of the children, parents, teachers, and administrators of the Alexandria Head Start program.

DOI 10.2466/10.11.28.PMS.111.5.447-457 ISSN 0031-5125

Welsch, Sullivan, and Justice (2003) and Treiman, Cohen, Mulqueeney, Kessler, and Schechtman (2007) pointed out that young children are especially knowledgeable about personal names, their own and those of other children. These names are important to children and they encounter them frequently in printed form if they attend preschool. Children's names are often the first written forms that have meaning to them (Ferreiro & Teberosky, 1982). Hence, it seemed reasonable that children might learn how names usually look early in the process of developing a more general understanding of the importance of letters and the appearance of words.

Treiman, *et al*. (2007) tested this idea by presenting preschoolers with consonant-vowel-consonant trigrams presented in various patterns of capitalization. The 3-year-olds' choices were random, except that they overwhelmingly recognized trigrams composed of Latin letters as being more like names than trigrams composed of three Sanskrit symbols. Five-year-olds consistently thought that trigrams composed of all capitals were more like someone's name than others, even those with just the first letter capitalized. This is not surprising, even though only the first letter is ordinarily capitalized when a person's name is printed. Preschoolers are commonly taught capital letters before lowercase letters, and usually see words and names with all letters capitalized. These children did, however, think trigrams with the first letter capitalized were more name-like than those with the last letter capitalized. This pattern was not changed when the children's own names were presented in four different capitalization patterns (first letter capitalized, last letter capitalized, all letters capitalized, and no letters capitalized). More than 90% thought that the version with all letters capitalized was the way their name should look, and nearly three-quarters also thought that the version with the first letter capitalized was a valid representation of their name. These percentages did not differ significantly.

In sum, the literature indicates that 4 ½- to 5 ½-year-old children had some appreciation of what names should look like: not only should the names be composed of Latin letters, but all of the letters or only the first letter should be capitalized. Since Treiman, *et al*. (2007) were the first to directly address the issue of capitalization, three experiments were conducted in this study to replicate key parts of their pioneering study in a different environment and population.

Middle-class or upper middle-class children such as those tested by Treiman, *et al*. (2007) have many advantages in enriched and challenging environments. These presumably include exposure to letters and words in printed form. Levin, *et al*. (2005) found that Israeli and Dutch preschool children of higher socioeconomic status were significantly more advanced

in stages of prewriting and writing than their counterparts with lower socioeconomic status. The same might apply to recognizing printed versions of names; hence, the middle- or upper middle-class children in the study by Treiman, *et al*. (2007) may represent only the upper end of the development that characterizes preschoolers. In contrast, the participants in the current study were children enrolled in federally funded preschools for families of lower socioeconomic status. Such children's understanding of the capitalization of names has not been studied, and investigating it might provide a more complete picture of the development of this aspect of early literacy, as these children often have more limited experience with books and alphabetic practice than those from higher income families. Such an investigation may also provide benchmarks and insights for developmental psychologists and educators who attempt to design curricula for such children. Hence, the present study was a replication, but it was also an extension of the pioneering study by Treiman, *et al*. (2007).

EXPERIMENT 1: CAPITALIZATION PATTERNS

Method

Design

For this experiment, three-letter consonant-vowel-consonant trigrams (which did not form any English words) were used as neutral stimuli. Five capitalization patterns were used: first letter capitalized, medial letter capitalized, last letter capitalized, all letters capitalized, and no letters capitalized. Each possibility was compared with every other, yielding 10 pairs, to test whether some capitalization patterns would be thought by the participants to look more like names than others.

Participants

Since Treiman, *et al*. (2007) found that children younger than 4 yr. old showed no preferences for different patterns of capitalization, children in the present study were the same age as the older preschool group in the Treiman, *et al.* study. Forty-seven participants ranged from 3 yr. 6 mo. to 5 yr. 6 mo. old ($M = 52.2$ mos., $SD = 4.9$). There were 25 boys and 22 girls. Three were East Asian, 19 were African American, and 25 were Hispanic/Latino. All the children were enrolled in a Head Start preschool program located in an urban suburb of Washington, DC. These preschools receive government subsidies to provide preschool education for children whose families have incomes below poverty guidelines.

Stimuli

Materials consisted of 20 laminated cards, each measuring 8 × 12 cm. These cards were printed in the same font and type size using five consonant-vowel-consonant (CVC) trigrams representing different nonword

capitalization patterns. The font printed on the cards was chosen based on its resemblance to letters found in a preschool classroom environment. Each card had a nonword CVC trio of letters, with either the first, second, third, all, or no letter capitalized. The vowels and consonants used were a, e, i, b, d, f, g, m, r, t, which look different as lower case or capital letters. No letter was repeated within a CVC pattern. The cards were formed into 10 pairs, with each pair showing two different capitalization patterns of the same nonword, so that each capitalization pattern was contrasted once with each of the other capitalization patterns. Different CVCs were used for the 10 different pairs, but the same CVCs were used for both cards within a pair (see Table 1).

TABLE 1
Capitalization Patterns of Nonword Consonant-vowel-consonants

	Patterns 1–5		Patterns 6–10
1	CVC vs Cvc	6	Cvc vs cvC
2	CVC vs cVc	7	Cvc vs cvc
3	CVC vs cvC	8	cVc vs cvC
4	CVC vs cvc	9	cVc vs cvc
5	Cvc vs cVc	10	cvC vs cvc

Procedure

To put the children at ease and create rapport with the researchers, the children were introduced to stuffed animals and asked to choose one and name it. The researcher kept the other one and gave it the name of Coco. The children and the researcher engaged in preliminary play with these toys in a quiet section of their classroom. This preliminary play was an effort to establish rapport and was the lone deviation from the procedure described by Treiman, *et al.* (2007). Once rapport was established, the researcher introduced a new game in which data would be collected. Thereafter, the procedure paralleled that used by Treiman, *et al*. (2007).

The children were shown a toy trashcan and a toy mailbox, and told that the game involved mailing cards or throwing them away. The children would see two cards at a time and use their stuffed animals to help decide which cards went in the mailbox and which went in the trashcan. For a practice exercise, the children were shown two cards, one with the name Coco and the other with three shapes: a triangle, a circle, and a square. The two cards were shown side by side. The children were told that one of the cards contained Coco's name and explained that the letters on the card were how Coco wrote her name. They were also told that the other card, which contained geometric shapes, was not how Coco wrote a name. (The name Coco is the same as that used by Treiman, *et al*. in their 2007 study. It might have been better to replicate their method less faithfully and use a name with three letters.)

The experiment was conducted over one session using 10 pairs of cards from a randomized list. A different random order was used for each child. Each pair of cards contained the same letters but with different capitalization patterns. The cards in each pair were presented in an alternating left-right pattern to control for children making responses based on placement.

The researcher told the child (and the stuffed animal) to place the card that "looks more like how a name should look" into the mailbox. They were told to put the other card, the one that did not look like a name, into the trashcan. The children were told that the names would not be ones they had ever seen. They were not told whether their responses were correct or incorrect.

Results and Discussion

Children's preference for the patterns in each pair was analyzed using chi square, the appropriate analysis for independent binomial scores. There were five significant differences: between CVCs with the first letter capitalized versus the last letter capitalized, with all capital letters versus all lowercase letters, all capital letters versus only the last letter capitalized, all capital letters versus only the medial letter capitalized, and all lowercase letters versus only the last letter capitalized. The preferences of the children for all comparisons are shown in Table 2. Effect sizes were medium (Cohen, 1972).

The preschoolers' preferences seem to indicate that they generally realized names had some letter capitalized, and that it should not be the medial letter or last letter. They tended to think that CVCs with all letters capitalized looked like names. Preschool teachers usually do write children's names in all capital letters, and parents may do so also. Children also see

TABLE 2
Children's Preferences For CVCs in Different Capitalization Patterns

Pattern	*N* Chosen	Comparison Pattern	*N* Chosen	χ^2	*p*	Effect Size
Cvc	26	cVc	21	0.53	> .05	
Cvc	34	cvC	13	9.38	< .01	.44
Cvc	19	CVC	28	1.72	> .05	
Cvc	23	cvc	24	0.02	> .05	
CVC	33	cVc	14	7.68	< .01	.40
CVC	31	cvC	16	4.79	< .05	.32
CVC	34	cvc	13	9.38	< .01	.44
cvc	23	cVc	24	0.02	> .05	
cvc	36	cvC	11	13.30	< .001	.53
cVc	26	cvC	21	.53	> .05	

Note.—Effect size is Cramér's φ. *N* Chosen is the number of times the CVC was chosen by the children.

signs and labels in the environment that have all letters capitalized. These factors probably contribute to the children's imperfect understanding of the rules for capitalizing names.

Direct comparison with the results of Treiman, *et al*. (2007) is complicated by the decision of those researchers not to differentiate between cvC and cVc patterns in their presentation of results. However, there are two clear-cut replications. CVCs composed of all capitals were thought to be more name-like than those with some letter other than the first capitalized, which is consistent with English capitalization rules. There were also two partial replications. CVCs with the first letter capitalized were thought more like names than those with the last letter capitalized, but not those with the medial letter capitalized. Treiman, *et al*. reported a significant difference when conditions where the first letter was capitalized were compared with the last two conditions (medial or last letter capitalized) combined. Similarly, Treiman, *et al*. reported that their 4-yr.-olds thought that CVCs with no letters capitalized were more like names than those with last or medial letters capitalized, combining the last two conditions. For the present sample, this was true when the last letter was capitalized, but not true when the medial letter was capitalized. There is one contradiction between the results of the two studies. Treiman, *et al.*'s older children thought that CVCs with the first letter capitalized were more like names than CVCs with no letter capitalized. The children in the present study showed no such preference.

EXPERIMENT 2: CAPITALIZATION OF ONE'S OWN NAME

Method

Exp. 1 indicates that 4-yr.-old preschool children have some sensitivity to English capitalization rules for names, but that it is very incompletely developed and quite possibly influenced by frequently seeing children's names printed in all capital letters in their preschool classrooms. However, it is reasonable to suppose that children would be more knowledgeable about how their own names are supposed to look than names in general. Levin, *et al*. (2005) suggested that children may have an emotional bond with their own first name, which their parents use with them. They see their own name printed more than any other, and both Levin, *et al*. and Bader and Hildebrand (1991) found that they learned to write their own names early in the process of developing literacy. Treiman, *et al*. (2007) also found that children were most accurate when asked whether their own names in different capitalization patterns were written "like your name should look." The 4-yr.-olds they studied were most likely to agree that their own name looked like it should look when it was composed of all capitals (91%) or had only the first letter capitalized (74%). A significantly different approach was taken in the present study to test which capital-

ization patterns of their own names the children thought looked the most like their names were supposed to look. Instead of being asked whether the various capitalization patterns of the letters in their names looked like their names should look, the children were asked which looked *most* like their names should look.

Participants

As was the case in the study by Treiman, *et al.* (2007), the children tested in Exp. 1 proceeded directly to this experiment, which lasted only about 5 min. The possibility of a carryover effect from Exp. 1 cannot be entirely ruled out. However, Treiman, *et al.* pointed out that, "we did not expect the prior participation to affect children's responses because no feedback about the correctness of the responses had been given in the prior tasks." The present researchers agreed a carryover effect was unlikely in the absence of feedback, and in addition performed analyses to test for one. The children's responses when a given CVC comparison was among the first five they saw in Exp. 1, as opposed to when it was among the last five, were compared. In no case did χ^2 approach significance. This indicated that the children's preferences did not change during the course of Exp. 1, which would be the case if a carryover effect was developing.

Stimuli

In Exp. 2, five cards per child were used, printed with the child's name in five different capitalization patterns: (1) initial letter capitalized, (2) medial letter capitalized, (3) final letter capitalized, (4) all uppercase letters, or (5) all lowercase letters. There is a problem in making comparisons of names and CVCs in that few names contain only three letters. Inasmuch as names also differ from each other in this respect, no solution is apparent, and the present study replicated that of Treiman, *et al*. (2007). If the name contained an even number of letters, one of the two letters closest to the center was chosen as the medial letter to be capitalized. If the medial letter appeared too similar to the lowercase version (such as the letter "u") the letter next to it was chosen to be the capitalized letter.

Procedure

No practice test was necessary for this experiment. The researcher explained to the child that he would be shown five cards placed in front of the child at one time. The child was told that each card was printed with the child's name and that he should choose the card which had his name correctly written. Because many of the preschoolers were from culturally diverse backgrounds, where multiple languages are spoken and written at home, each child was asked to look slowly at each card and "put the one that looks more like how your *teacher* would write your name in the mailbox, and place the other ones in the trash can." The cards were pre-

sented in a different random order for each child, to control for making a response based on order of presentation.

Results and Discussion

The children chose a version of their name with the first letter capitalized on 77% of the trials. No more than four children chose any other capitalization pattern. Effect sizes were large (see Table 3). Hence, it is clear that they were much better at recognizing the correct appearance of their own names than the rule by which names in general should be capitalized. The method used here indicates that most children understood that only the first letter of their name should be capitalized. This did not emerge in the study by Treiman, *et al*. (2007), who did not require children to make a single choice between different capitalization patterns, and whose participants consequently showed tendencies to choose versions of their names with all letters capitalized as frequently or more frequently than versions with only the first letter capitalized. Despite this difference, both studies make the point that 4-yr.-old preschoolers have a sense of how English capitalization rules should apply to their own names before they apply them consistently to personal names in general. This sort of perception is characteristic of preschoolers in many contexts; they learn what applies to them personally before they learn what applies to other children (Piaget, 1937/1954).

TABLE 3
Children's Preferences For Different Capitalization Patterns of Their Own Name

	Method of Writing Child's Own Name				
	Name	NAME	name	naMe	namE
N Chosen as correct	36	2	3	2	4
Comparison	χ^2	*p*	Effect Size		
Name vs NAME	30.42	< .001	.80		
Name vs naMe	16.49	< .001	.59		
Name vs namE	30.42	< .001	.80		
Name vs name	25.60	< .001	.73		

Note.—Effect size is Cramér's φ. *N* Chosen is the number of times the CVC was chosen by the children.

EXPERIMENT 3: LATIN LETTERS VS SANSKRIT SYMBOLS

Method

Design

Lavine (1977) reported that 3- and 4-yr.-olds distinguished Latin letters from dissimilar symbols from other writing systems. Levy, Gong, Hassels, Evans, and Jared (2006) found that 4-yr.-olds, but not 3-yr.-olds, distinguished strings of Latin letters from Indian symbols, and Treiman,

et al. (2007) found that both 3- and 4-yr.-olds were very accurate at distinguishing Latin CVCs from trigrams made of Sanskrit letters. Exp. 3 was intended to replicate the latter finding.

Participants

The children who participated in the first two experiments also participated in Exp. 3.

Stimuli

Exp. 3 utilized five cards with letters from the Latin alphabet in a CVC pattern and five cards with letters from the Sanskrit alphabet. The letters from both alphabets were printed in the same size and font. The Latin letters used were u, o, c, k, s, v, and z. The Sanskrit letters अ ए इ ओ ठ were used; these look very different from their Latin counterparts. For both the Latin and Sanskrit cards, either the first, third, all, or no letters were capitalized.

Procedure

The practice exercise was conducted as in the first experiment. Then the researcher explained to the child that he would see two cards side by side. The child was asked to look at the cards and choose which one "looks most like a name in English" and place it in the mailbox. He was asked to place the other card into the trashcan.

Results and Discussion

Children consistently preferred CVCs with Latin letters over CVCs with Sanskrit. In all five comparisons the difference was statistically significant and effect sizes were large (Table 4). This experiment supports the finding of Lavine (1977) and Treiman, *et al*. (2007) that preschoolers differentiate Latin letters from symbols used in other languages that are very dissimilar in appearance, and the report of Levy, *et al*. (2006) that this is at least true for 4-yr.-olds. This was consistent across all patterns of the capitalization of the letters. The children's disregard of the pattern of capitalization in these comparisons is similar to that reported by Treiman, *et al*. (2007).

TABLE 4

Children's Preferences For Latin Versus Sanskrit Trigrams

Pattern	*N* Chosen	Comparison	*N* Chosen	χ^2	*p*	Effect Size
Cvc	39	Sanskrit	8	20.45	< .01	.65
cVc	38	Sanskrit	9	17.89	< .01	.62
cvC	38	Sanskrit	9	17.89	< .01	.62
cvc	40	Sanskrit	7	23.17	< .01	.49

Note.—Effect size is Cramér's φ. *N* Chosen is the number of times a CVC was chosen by the children.

GENERAL DISCUSSION

Studies of children's knowledge of their names and then names of other people may provide a window for study of the very early development of literacy. Children first learn that a fixed string of letters has a fixed meaning in the context of their own names, then learn the letters in their names, and finally learn proper capitalization rules for their names. It is not altogether surprising that in this respect they show the usual tendency of preschoolers to learn about themselves before they learn about other people.

With some differences, the 4-yr.-olds in the present experiments performed similarly to the 4-yr.-olds from higher income families studied by Treiman, *et al*. (2007). They recognized that personal names were more likely to be composed of Latin letters than Sanskrit symbols, although they were not as good at this activity, choosing Latin letters about three-quarters of the time versus nearly 100% for Treiman, *et al.*'s 4-yr.-olds. The children also tended to recognize that personal names should not have only their medial or last letter capitalized. Their strongest tendency when their own names were not involved was an erroneous tendency to perceive "names" composed of all capitals as correct, which may reflect a presentation common in preschools. This tendency was also found in the study by Treiman, *et al*. However, unlike the preschoolers in that pioneering study, present children did not make this mistake when deciding how their own names should appear. A large majority selected the proper capitalization (first letter only capitalized) when required to choose between it and other capitalization patterns.

A caveat is necessary here, in that, as with the studies by Treiman, *et al*. (2007), the same children were assessed in each experiment. This means that the order of the experiments was itself a variable which could have affected the preferences the children showed in Exps. 2 and 3. The absence of feedback diminishes this possibility, and analysis of potential shifts within the course of Exp. 1 indicates that no changes were occurring. However, whenever the same participants are used as their own controls, it cannot be ruled out that the subjects' later responses may have been affected by what they experienced earlier.

Hence, it is clear that by the age of 4 yr., preschoolers from low income or high income families have begun to develop some appreciation for the way printed personal names look. Their understanding of how names in general should look is partly correct but also seems to show an erroneous tendency that may be influenced by how they see names printed in their preschools or in labels sometimes used by parents. Children show a greater understanding of how their own names should look, and tend to distinguish the correct capitalization pattern as opposed to in-

correct alternatives. A change in practice, encouraging teachers to always capitalize only the first letter of a child's name, may speed the development of this understanding.

Communication of this idea to parents may be useful, because, as Levin, *et al.* (2005) pointed out, parents often use children's first names as a vehicle for teaching them about letters and writing. Children are encouraged to learn the names of the letters in their own names and to print their names. They may often see their names attached to their belongings or used as labels for their drawings and other creations. In addition to being able to distinguish their own things from those of others, learning their own names may be important as a step toward learning the use of names of others as labels, and as a gateway to learning the use of arrangements of letters to name things as well as people, and to convey ideas. Hence, parents can also be encouraged, through letters sent home from preschools and parent meetings, to be careful to capitalize only the first letters of their children's names in anything that the children may see.

REFERENCES

Bader, L. A., & Hildebrand, V. (1991) An exploratory study of three to five year olds' responses to the Bader Reading and Language Inventory to determine developmental stages of emerging literacy. *Early Child Development and Care*, 77, 83-95.

Cohen, J. (1972) A power primer. *Psychological Bulletin*, 112, 155-159.

Ferreiro, E., & Teberosky, A. (1982) *Literacy before schooling*. New York: Heilman.

Lavine, L. O. (1977) Differentiation of letter-like forms in prereading children. *Developmental Psychology,* 13, 89-94.

Levin, I., Both-Devries, A., Aram, D., & Bus, A. (2005) Writing starts with own name-writing: from scribbling to conventional spelling in Israeli and Dutch children. *Applied Psycholinguistics*, 26, 463-478.

Levin, I., & Bus, A. (2003) How is emergent writing based on drawing? Analyses of children's products and their sorting by children and mothers. *Developmental Psychology,* 39, 891-905.

Levy, B. A., Gong, Z., Hassels, S., Evans, M. A., & Jared, D. (2006) Understanding print: early development and contributions of home literacy experiences. *Journal of Experimental Child Psychology*, 93, 63-93.

Piaget, J. (1937/1954) *The construction of reality in the child*. New York: Basic Books.

Treiman, R., Cohen, J., Mulqueeney, K., Kessler, B., & Schectman, S. (2007) Young children's knowledge about printed names. *Child Development,* 78, 1458-1471.

Welsch, J. G., Sullivan, A., & Justice, L. M. (2003) That's my letter!: what preschoolers' name writing representations tell us about emergent literacy knowledge. *Journal of Literacy Research*, 35, 757-776.

Accepted September 17, 2010.