

# A Child Learns the Alphabet

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This study chronicles the process in which a young child teaches herself to write the letters of the alphabet. The letters which she chose to learn may be classified into categories containing distinctive features: of circles: O, C, Q; straight lines: L, I, T, E, F, H; lines and loops: B, P, R; and angles: M, N, Z, K, V, W. The four stages through which the child progressed before she was able to recall the graphic form of a letter which only the letter name was mentioned were: Stage I, the letter must be visible so that the child could copy the form; Stage II, the distinctive features of a letter written in the air facilitated recognition of the graphic form; Stage III, the verbal description of the letter enabled the child to write the letter; and Stage IV, the name of the letter was sufficient information to enable the child to produce the letter. Implications for further research and possible teaching methods are recommended.

## *Review of the Literature*

The majority of literature that has been written on the process of writing acquisition centers on developmental theory. Legrums (1932) lists five stages through which a child progresses. At first a child makes unorganized scribbles which become more recognizable as time progresses. Cattell (1960) describes the stages as starting with scribbling at 18 months and steadily progressing toward the written word with its goal, expressive writing. The stages begin at four years when the child prints a few capital letters with a preference for circular letters (such as C, G, O, Q) or straight line letters (such as E, H, I, L, T). By five years the child prints some letters of varying sizes, which are usually large and placed in various positions. As time passes, the writing develops from letters to words to sentences.

The role that instruction plays in the development of children's writing causes as much interest as does the role of spontaneous development of writing. Wheeler (1971) analyzes the spontaneous

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writing of kindergarten children in order to detect developmental trends from aimless designs to words in sentences. Experiments by Wheeler (1971) and Gibson, Schapiro and Yonas (1968) indicate that children can learn to write without instruction if sufficiently motivated.

At this point, there is no step-by-step description of the development of letter acquisition. Therefore, there is no evidence to indicate whether a child learns letters in an organized manner or in a haphazard manner. Certain questions concerning beginning writing need to be answered. Is the acquisition of letterforms a random process that the child stumbles through and eventually emerges with the ability to write letters? What motivates a child to begin writing? What types of motivation enable the child to learn all 26 letters, upper- and lower-case? What type of reinforcements are needed until mastery is achieved? Does the child need to know that a letter is a letter or that a letter can be read and has a sound correspondence in order to have the motivation to continue learning to write? What methods of instruction can be utilized to teach the letters of the alphabet to children who are not motivated to learn without assistance? These questions can be answered more fully after examining the manner in which a child has mastered the alphabet.

### *The Study*

*Learning Circle Letters.* This study started when Sarah—a white, middle class child—began to teach herself to write at the age of 2½ years. Sarah is the second child of college educated parents. At the time that Sarah began to write, she was able to identify the names of all the letters of the alphabet. Neither parent taught her the names of the letters in a formal manner, although she did learn most of the letters and became motivated to write through television program, *Sesame Street*. After viewing the presentation of the letter *Q* on *Sesame Street*, Sarah requested that someone draw the letter for her. A number of requests for someone else to write the letter were made before an attempt was made to draw the letter alone. The first attempt consisted of a very uneven and overlapping circle with a slanted line piercing the circle (Figure 1).

The letter *O* developed from the letter *Q* when Sarah discovered

Figure 1. The letter *Q*.



that just before the addition of the intersecting line, the letter *Q* looked like an *O*. Although this discovery was made within a week of writing her first letter, Sarah had made hundreds of *Q* letters before she discovered the similarity between *Q* and *O*. The process of writing the circle and the intersecting line required complete concentration and therefore the parts of the letter could not be separated from the whole. It was only after the child was familiar with the letter could she examine the unfinished letter. After the discovery of these two letters, Sarah became an avid creator of notes and letters that consisted of strings of the letters *O* and *Q* which were then read as words. At this point she was aware that letters written on a page could be used to communicate a message.

One month later Sarah became interested in the letter *A* after she discovered that she could write it by herself. One day, while writing a series of lines and circles, she recognized one of the figures as an *A*. This *A* was made with curved lines and resembled a divided and bisected *O* (Figure 2). This letter *A* continued to be written in this manner for almost one year, and did not change its shape or form and is therefore classified as a circle letter. Further development of this letter to a straight-line form will be covered later in this study. The first two letters learned consisted of circles as distinctive features of the *Q* and *O*. The third letter, *A*, was altered in shape and therefore a circle became part of the features of this letter. All these beginning shapes contained a circle with a line which distinguished this circle from the other letters.

*Learning Line Letters.* Letters that consisted of straight lines (such as *T*, *L*, *I*) were learned together approximately three months after she learned the letter *O*. When Sarah saw the letter *T* on television,



Figure 2. The letter *A*.

she announced, "I can make that!" In this instance she was aware of her ability to write a letter before attempting it. The letter *T* often varied in shape because of Sarah's poor coordination (Figure 3). Many times it was very difficult for adults to recognize this symbol as the letter *T*, but it was never difficult for Sarah to recognize the letter.

The choice of the next four letters—which were also learned at three years of age—indicated an emerging pattern. The letters *H*, *I*, *E*, *L* consist of horizontal and vertical straight line features. None of these letters, nor the *T* that had been previously learned, contained curves or diagonal lines. It is possible that these letters were chosen to write because they required the least amount of control or because the similar features made them easier to identify and to remember; perhaps it is a combination of all these factors. Only one letter of all these straight-line letters continuously varied in its shape. The capital letter *E* was made with one vertical line and a range of from two to seven horizontal lines (Figure 4).

The other letters learned did not require the fine distinction that the letter *E* required. Even after thirteen months of writing these letters—from age 2 years 9 months to 3 years 10 months—the letter *F* consisted of two vertical lines often arbitrarily placed (Figure 5), while the letter *E* consisted of nine horizontal lines (Figure 6). The number of horizontal lines for the letter *E* may have been caused by the inability to discriminate letters or by an analysis that the more lines, the better one is able to discriminate the letter *E* from the letter *F*. A theory of "if three lines are okay, several should be superb" emerges.

Each time that Sarah became interested in a new letter, her parents wrote both the upper-and the lower-case forms until preference was shown for one form of the letter. The most frequent response to the wrong form of the letter was an exasperated, "Not that one, the other one." Some of her choices were easy to analyze, while the reason for other choices did not become evident until later. The lower case *i* is a distinctive letter which was always made with care, especially the dot which perched on the tip of the straight line (Figure 7). Sarah's sister wrote a capital *L* for the first letter of her name and the familiarity with this letter resulted in the use of the capital rather than small letter *l*.



Figure 3. Variations of letter *T*.

Figure 4. The letter *E*.

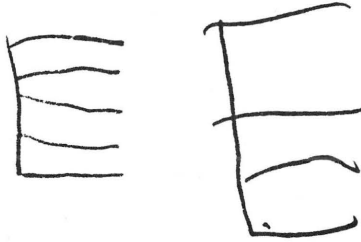


Figure 5. The letter *F*.



Figure 6. The letter *E*.

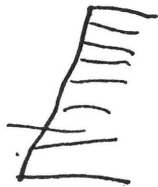
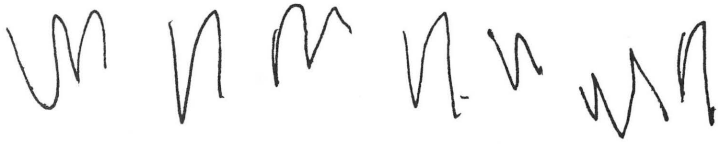


Figure 7. The letter *i*.



Figure 8. The letters *m* and *n*.

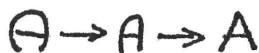


*Letters with Lines and Loops.* The next group of letters (*R, B, P, D, m, and n*) all contained a loop and a straight line. The first of these was learned at 3 years 2 months. The letters *m* and *n* were confused perhaps because of an inability to discern the finer features of *m* and *n*. As in the letters *E* and *F* where there was no fine distinction in the number of lines used, there was an inconsistent number of loops in the *m* and *n* (Figure 8). The letter *U* and the letter *V* were read as different letters, but were written as the same letter, *U*. In this instance the distinctive features being learned were a line and a loop; therefore, an existing letter was changed in form to emphasize the new distinctive feature. The letter *V* was altered and written with a loop so that it now resembled the letter *U*. At the same time, the letter *A*, which had resembled an open *O* bisected with a bar, began to change its form until it resembled an upside-down *U* (Figure 9). In both of these instances, the line and loops of letters were determined to be the important feature of the letter and other letters were altered in order to contain this distinctive form. The angles in the letter *A* were distorted in order to accommodate the newly discovered attribute of lines and loops.



Figure 9. The letter *A* changes form.

Figure 10. The progress of letter *A*.



*Angle Letters.* Angle letters did not appear until ten months after the writing process had begun and were the last type of letters to be learned. When Sarah became aware of letters with diagonal lines (at the age of 3 years 6 months), distinct changes in her writing became apparent. The letter *A* developed further to two diagonal lines and an angle (Figure 10). The *m* and *n* developed more angled and diagonal lines. The loops of the lower-case *m* were changed to the angles of the upper-case *M*. But, just as in the loop form, there was no distinction as to the number of slanted lines (Figure 11).

A form of regression also developed when slanted lines were introduced. The letter *U*, which Sarah had been writing for six months, became confused with the letter *V*. The curved loop of the *U* seemed to disappear and became an angled *V*. If Sarah wanted to spell the word “cute,” the letter *u* resembled the upper-case *U*, but after the introduction of the letter *V* it would be written “cvte.” She could, however, still tell the difference between the letters *U* and *V* when they were printed by someone else. Here again, she altered the distinctive feature of a letter to accommodate the angle feature that she has just discovered.



Figure 11. The progress of letters *m* and *n*.

Because Sarah's name begins with *S*, she was highly motivated to write this letter, yet she had distinct problems mastering it. She was unable to write a recognizable symbol after fourteen months of letter writing. She was consistently unable to perceive how to start the formation of the letter and consistently began with a straight rather than a curved line. The letter then resembled a ζ, yet Sarah never confused this symbol with a ζ when presented with her own letter days later (Figure 12). At four years old a curved beginning line was produced, but the start was still backwards and did not resemble the letter *S*. Sarah was always aware of the fact that she could not produce the letter *S* and when she signed her name, often requested that someone "start it" for her and then she would finish the rest. Needless to say, this situation often caused frustration for the child and one day, Sarah threw her pencil across the room and declared that she would never be able to write the letter *S*. She was then introduced to tracing over a letter written by someone else as well as sandpaper letters for finger tracing. After ten tracings, she was able to do the letter *S* on her own. She jumped about shouting with surprise, "I did it!" Within a few weeks, however, she was unable to write it as well as she had after the tracing activity. Eventually, she returned to the backward starts (Figure 12). A repeated tracing activity would cause a brief improvement for a few days, but then this improvement would disappear. Learning to write includes not only the motivation but also the developmental dexterity needed to produce the components of a letter. In this instance the ability to write did not keep pace with the motivation to write. Activities such as tracing written letters and tracing sandpaper letters did not speed up the process of coordination and perception that are needed to produce a symbol correctly for a long period of time.

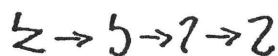


Figure 12. The progress of letter *S*.

### *Mental Processing and Distinctive Features*

Sarah was always aware of the letters that she could write and of the letters that she could not write. The previous example of asking someone to start the *S* in her name is one instance. Sarah seemed to “picture” the letters in her mind when she heard a letter name. If she asked the spelling of a word like “Daddy,” she would respond in one of two ways to a letter name. If the letter was well known to her, like *A*, she would immediately write it down. If, however, she was given the name of a letter with which she did not have immediate recall, like *Y*, she would stop, stare off in the distance and then say, “Oh, yeah,” or “I don’t know it.” It seemed as if she was trying to produce a mental picture of the letter in order to produce this letter on paper. One of the main questions then is, how does she store the information about the letters in order to produce a specific letter upon demand?

Sarah learned the letters of the alphabet in a definite pattern: circles—*O, Q, A* (with curves); straight lines—*L, H, T, i, E, F*; lines and loops—*B, R, P, D, m, n*; and diagonal lines—*K, W, X, M, N, A, V*. This pattern of the grouping of characteristic features of the letters of the alphabet corresponds to the theory of distinctive features (Gibson and Levin, 1975). Distinctive features consist of the contrastive features of the alphabet—such as the straight, curved, and diagonal lines—that provide the pattern of uniqueness of one letter to another. These patterns enable the individual to distinguish one letter from another letter.

In order to determine whether or not a child can and/or does use distinctive features in order to distinguish the letters of the alphabet, Sarah’s parents developed a series of activities to determine the influence and importance of distinctive features. In the first stages of writing, any letter that Sarah requested was written on a piece of paper and Sarah copied the letter that the adult had written. After a certain amount of familiarity with a letter, a requested letter was written in the air. For example, if the letter *H* was requested, a two-foot high letter *H* was drawn in the air. Each letter was written in the form of the upper- or the lower-case that Sarah had chosen for the letter; *m, n, i, L, H, T*. Sarah watched the letter as it was drawn in the air and then she wrote the letter on her paper. If the form written in the air did not

match the form that Sarah used, she was not able to write the letter. For example, if the capital *H* rather than the lower-case *h* (which Sarah used) was written in the air, Sarah was not able to recognize the letter. An unfamiliar form of the symbol did not help her in connecting the letter name with its graphic symbol.

As Sarah became more accustomed to this form of recognizing letters, the form written in the air became more vague. As she became more familiar with the letters, she needed less clues in order to recognize the letter. The letters were written in a general pattern that reflected the major distinctive feature of each letter. *P*, for example, would be written as a straight line and a loop. In addition, the letter could be written backwards or upside down since only the distinctive features were needed to provide recognition.

The next stage was to give Sarah the distinctive features orally. For example, "The letter *P* has a line and a loop on part of the line." "The letter *B* has a line with two circles on the line." A certain amount of familiarity with the letter was necessary in order to progress from one stage to another.

The goal of these stages and the last stage to be reached occurred when a letter name was all that was needed for the child to recall the graphic symbol. The letters which were produced upon mention of the letter name were those letters used most frequently. These letters were familiar enough to Sarah that she did not need assistance in order to write the letter name that she heard. Other letters, such as *J* and *G*, which were rarely written by Sarah never progressed beyond the first stage in which they had to be written on paper in order to be recognized. If these letters were written in the air, Sarah was unable to recognize them. The progress from one state to another was determined by the child's familiarity with the letter.

### *Conclusions*

The findings of this study may help us to look further at how children begin to learn the alphabet. If one child's unstructured and internally motivated learning of the alphabet can be categorized into sets that contain specific features, then it may be true that other children abstract specific features of a letter and are aware of these contrastive features. A study of other children may

indicate that there are specific patterns of letter learning. In addition, general features may be consistent and all children may learn the letters in a specific order: circle letters, straight line, line and loop, diagonal. Perhaps the sequence of letters in each category will differ with one child learning the sequence *B, P, D* as Sarah did and another child learning the sequence *D, B, P*. Certainly, Sarah characterized letters as a set that included specific distinctive features and then differentiated individual letters. The acquisition of the alphabet is not a random process, but an organized and systematic act of learning.

The fact that Sarah never associated any sounds to the letters other than the letters in her name indicated that she did not see the relationship between writing individual letters and reading. Often, Sarah would “read” a note that she had written, but the note always was read with words which did not contain the letters that she had written on the paper. She never tried to sound out a letter nor did she give a sound correspondence to any letter. The only exceptions were *S* and *M*, the initials of her name. Just after the last category of distinctive features was learned, Sarah wrote a note to a friend (Figure 13). This note included representative letters from each set of distinctive features: circles, *O*; straight lines, *H*; line and loop, *B, P, D*; and angles, *V*. This note indicated that Sarah is aware that letters convey meaning, but more important, it is a culmination of her letter learning. Sarah did not concentrate on the fact that letters had sounds. This fact may be due to her total involvement in the writing act. She is looking only at the graphic details of the letters that she has learned. Perhaps attention to sounds and symbols at the same time is too much for this child. Learning sounds is a step that follows after this step is completed. The note, however, reflects that Sarah is aware of her final goal, to communicate.

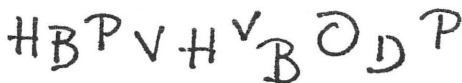
A handwritten string of ten letters: H, B, P, V, H, V, B, O, D, P. The letters are written in a simple, child-like cursive style. The 'H's are formed with a single vertical line and a diagonal line. The 'B's have a vertical line and a loop. The 'P's have a vertical line and a loop. The 'V's are formed with two diagonal lines meeting at a point. The 'O' is a simple circle. The 'D' is a vertical line with a curve at the top.

Figure 13. A note written by Sarah to a friend.

The only reinforcement that this child needed in order to learn all 26 letters was the satisfaction derived from the successful completion of the letter. Understanding of sound-symbol relationships was not necessary for Sarah to continue learning all the letters of the alphabet. She was aware of the fact that letters can be "read" and was able to "read" notes to her friends even though only five letters had been written on the page. In this instance, she dealt with the visual appearance of letters before approaching the linguistic meaning of letters.

This study has brought up another question concerning the complexity of the organizing system children use when learning a new skill. Is the discrimination of letters a totally different task than the writing of letters? Certainly in Sarah's case, the learning of a new letter caused regressions in the discrimination is intriguing and occurred specifically with *U* and *V*. One possible hypothesis is that a new set of distinctive features demands so much concentration that all letters are then examined in order to find this new distinctive feature. As a result, confusions occur. Another hypothesis is that a new writing movement may be required that is not natural and may be handled only if extreme attention is paid to the act. After the performance becomes more routine, the required attention decreases, and a more natural action takes over. Perhaps other studies with other children will be able to answer the question as to whether or not regressions are evidence of an interference effect.

Sarah's acquisition of letters can be divided into four stages:

Stage I: The letter learned must be seen, and direct copying is necessary in order to aid the child in successfully producing the letter.

Stage II: A more abstract symbol, such as writing the letter in the air, aids in graphic recall of the letter named. Familiarity with the letter enables the child to recognize the letter when provided with fewer clues. The clues necessary include the distinctive features of the letter: lines, loops, and circles.

Stage III: These same distinctive features may be given orally to the child. If told the letter *V* has two slanted lines, the child is able to produce the letter needed.

Stage IV: The name of the letter enables the writer to produce the graphic form of the letter.

In each of these stages, the use of distinctive features aids the child in learning to write the letters of the alphabet. Perhaps because the information concerning the graphics form of the letter is stored according to the distinctive forms of the letters. Familiarity with the letter is needed in order that the child progress from one stage to another. These stages may be investigated further in order to determine if the use of distinctive features aids the child in the learning process. A teacher may also develop games for each of these areas in order to provide visual, verbal, and motoric reinforcement for letter learning. Children may play guessing games with each other and give a verbal, motoric, or visual clue to aid in the guessing of a letter name.

How, then, does the information from this study provide us with information that will be of use in the teaching of the alphabet? If children do differentiate letters through the use of distinctive features, then we need to evaluate our present method of teaching letter recognition and other prereading skills. Presently we try to teach children letters, but in reality the child must develop his own strategy for distinguishing visual differences between letters. Early methods of instruction do not teach the differences between letters emphasizing distinctive features. If children use distinctive features, then we can simplify the task of the young child and provide him with the strategy that he will develop on his own.

A child is a learning theorist who looks for relationships in what he is learning in order to develop a system of categorization. If the teaching of the alphabet is built upon a system of categorization (i.e., distinctive features) a child then learns how to observe graphic similarities and differences. The emphasis on distinctive features enables the child to grasp the principle of categorization. He may then expand upon this system of categorizing relationships when he must search for relationships between sounds and letters in beginning reading. Further research will indicate if the teaching of distinctive features is a more effective means of teaching the letters of the alphabet because it coincides and supports the natural and spontaneous learning process.

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