

# TELLING FRONTS FROM BACKS: THE IMPACT OF MISSING VISUAL INFORMATION FOR THE ACQUISITION OF LOCATIVE EXPRESSIONS IN YOUNG BLIND CHILDREN

Anne Baker



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## BACKGROUND

### Linguistic forms of locative expressions

- Using affixes  
e.g. Finnish  
Turkish - *deniz-e* sea+dative 'in the sea'
- Using adpositions  
e.g. French *dans la rue*  
English *in the street*
- Using verbs with locative meaning  
e.g. Korean  
*kkita* 'put X in/on Y where X fits tightly'

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## BACKGROUND

### Order of acquisition

The following is attested in many languages:

1. in, on, under
2. beside
3. back (with objects with back-front orientation)
4. front (with objects with back-front orientation)
5. between
6. behind (with objects with no back-front orientation)
7. front (with objects with no back-front orientation)

- usually attributed to cognitive development.

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## BACKGROUND

### Cross-linguistic differences

- But do all language divide up space according to vertical/horizontal dimensions and surface and containment?

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## LINGUISTIC DIFFERENCES

### English on



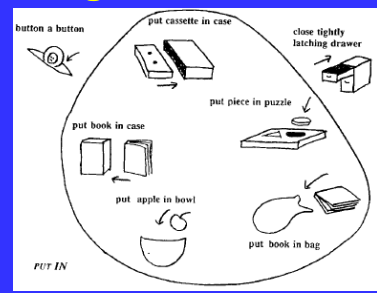
Bowerman & Choi 1993

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## LINGUISTIC DIFFERENCES

### English in



Bowerman & Choi 1993

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LINGUISTIC DIFFERENCES

### Equivalents in other European languages

Clark 2004

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LINGUISTIC DIFFERENCES

### Korean

Bowerman & Choi 1993

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LINGUISTIC DIFFERENCES

### Acquisition order revisited

- Korean children learn the distinctions made in Korean early (18 months)
- Even before they produce the forms.
- Conclusion: children probably have a conceptual map for spatial categories but the linguistic forms they are exposed to are mapped on to the concepts very early

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LANGUAGE AND COGNITION

### Acquiring locative expressions in English

Linguistic term	Cognitive concept
<i>in</i>	containment
<i>on</i>	support & attachment
<i>on top of</i>	support & vertical alignment
<i>next to</i>	lateral horizontal alignment
<i>in front of</i>	horizontal alignment, front surface of referent object/self
<i>behind</i>	horizontal alignment, back surface of referent object/self

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LANGUAGE AND COGNITION

### The importance of the reference object

'place the ball in front of the doll'

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LANGUAGE AND COGNITION

### The importance of the reference object

'place the ball in front of the doll'

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## LANGUAGE AND COGNITION

### The importance of the reference object

'place the ball in front of the doll'



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## LANGUAGE AND COGNITION

### The importance of the reference object

'place the red ball in front of the yellow ball'



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## LANGUAGE AND COGNITION

### The importance of the reference object

'place the red ball in front of the yellow ball'



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## LANGUAGE AND COGNITION

### Pre-requisites for carrying out the task

1. Knowing whether the reference object (doll/ball) has a front
2. Knowing that this knowledge is necessary for understanding and producing the term *in front of*
3. Knowing which features identify the front of the reference object if appropriate
4. Identifying these features

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## LANGUAGE AND COGNITION

### Stages in acquisition

(Kuczaj & Maratsos 1975)

1. Child knows front and back of own body.
2. Child knows the fronts and backs of fronted-object types
3. Child can place another object in front of and at the back of these objects.
4. Child can generalize knowledge of fronts and backs to novel objects.

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## METHODOLOGY

### Study of comprehension of locative expressions in blind children

- 20 English speaking blind children aged 5-8 years (14 boys, 6 girls)
- No other known disability
- Tested at their school
- Tested on expressions: *in, on, on top of, under, in front of, behind*

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## METHODOLOGY

Asked to place objects in relation to one another:

for *in front of* and *behind*

- Objects to be placed:  
a squeezey ball or doll
- Reference objects  
doll (fronted)                      cube (non-fronted)  
car (fronted)                        football (non-fronted)
- Total of 8 items per expression
- After all testing was complete, subjects were asked to identify the fronts and backs of all objects.

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## RESULTS

### Quantitative Results (number and % correct)

Variable	fronted max = 8	non-fronted max = 8
<i>in front of</i>	3.4 43% (sd 3.1)	6.05 76% (sd 2.7)
<i>behind</i>	3.65 46% (sd 2.9)	5.85 72% (sd 1.9)
<b>Total</b>	<b>3.5 44% (sd 3.1)</b>	<b>5.95 74% (sd 2.2)</b>

Less than 2% non-responses

Sign. difference ( $p < .01$ ) between fronted and non-fronted objects

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## RESULTS

### Quantitative Results (knowledge of front/back features)

Variable	Does X have a front side? max = 20	Where is the front of X? max = 20
<i>Self (fronted)</i>	20	20
<i>Car (fronted)</i>	8	2
<i>Doll (fronted)</i>	11	7

Sign. difference between knowledge of existence of a front side and ability to identify it.

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## RESULTS

### Quantitative Results (knowledge of front/back features)

Variable	Does X have a front side? max = 20	Where is the front of X? max = 20
<i>Self (fronted)</i>	20	20
<i>Car (fronted)</i>	8	2
<i>Doll (fronted)</i>	11	7
<i>football (non-fronted)</i>	5	n.a.
<i>Cube (non-fronted)</i>	6	n.a.

Some children (younger) attribute front/back to non-fronted objects

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## RESULTS

### Qualitative results

Children identified front sides:

Self: on basis of stomach or nose

Doll: nose sometimes confused with little finger

Car: no consistent response e.g. headlights, bumper, bonnet

Football and cube: responses like 'if they talk'

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## BLINDNESS

### Errors with non-fronted objects

In front of = close to self

Behind = far from self

No clear orientation to reference object

Older children start to place a hand on reference object.



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## Conclusions: stages

1. Blind child knows the front and back of own body.
2. Blind child learns *one for one* that some objects have fronts and backs and some do not.
3. Blind child learns *one for one* to identify those front/back features and can then place another object in front of and at the back of these objects.
4. Blind children have problems generalizing knowledge of fronts and backs to novel objects.

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## Thoughts for future research

- Training on frontal features in younger children, then test on understanding of linguistic expressions
- What are the implications for blind children learning a language with a different structure?

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