DOCUMENT RESUME

ED 454 668 EC 308 472

AUTHOR Lewis, Pamela F.

TITLE Categorization in Adults with Severe to Profound Mental Retardation.

PUB DATE 2001-04-00

NOTE 15p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Minneapolis, MN, April 19-22, 2001).

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS Adults; *Classification; *Cognitive Processes; *Communication Disorders; *Concept Formation; Expressive Language; *Language Acquisition; Receptive Language; *Severe Mental Retardation

ABSTRACT

This brief paper presents a summary of a study which examined the developmental progression of categorization and its relationship to language development in 12 adults with severe to profound mental retardation and with less than 100 words of expressive language (including manual signs). Subjects were asked to sort physically eight miniature objects consisting of four objects from each of two categories. Perceptual similarity and inclusiveness were manipulated as five contrasts had perceptually identically category members and five had perceptually non-identical category members. Receptive and expressive understanding of object labels was also assessed. The study found that only perceptual similarity influenced categorization. Nine subjects were able to sort categories with identical members, an ability associated with the onset of naming in typically developing infants and toddlers. Level of inclusiveness did not influence categorization and there was no relationship between the number of categories sorted and any of the language measures. (Contains 15 references and 4 tables.) (DB)

Categorization in Adults with Severe to Profound Mental Retardation.

Pamela F. Lewis

Categorization in adults with severe to profound mental retardation

The development of categorization and its relationship to language development are important issues that should be explored in atypical populations for both theoretical (e.g., converging support for proposed sequences of development) and applied (e.g., intervention) reasons.

In typically developing infants and toddlers the development of categorization skills has been linked to the level of inclusiveness of the category, i.e., basic ("car"), global or superordinate ("vehicle"), and subordinate ("convertible") levels. Researchers do not agree, however, as to the developmental primacy of these levels (Mandler and McDonough, 1993; Rosch, 1978). More recently, researchers have linked the developmental progression of categorization skills to similarity of category members (Madole and Oakes, 1999).

Regarding the relationship of language and categorization, several researchers have found a positive link between between vocabulary size and categorization skills in typically developing infants and toddlers (e.g., Gopnik and Meltzoff, 1987, 1992).

The present study examined the developmental progression of categorization and its relationship to language development, in adults with severe to profound mental retardation.

Method

Participants were 12 adults with severe to profound mental retardation who had no more than 100 words of expressive language (including manual signs). An object manipulation technique was employed. Each participant handled 10 category contrasts, each consisting of four miniature objects from each of two categories, with all eight objects presented simultaneously. The dependent measure was the number of categories they sorted (physically placed together).

To study the development of categorization, perceptual similarity and level of

inclusiveness were manipulated. Thus five of the contrasts had perceptually identical (i.e., highly similar) category members, and five had perceptually non-identical category members. The category contrasts included basic and global levels. Because this was an exploratory study, there were also two "nonlinguistic" contrasts. See Table 1.

To study the relationship of categorization skills and vocabulary, participants looked at pictures of objects from the same categories used in the categorization task, and were tested on receptive and expressive understanding of the object labels. In addition, a familiar caregiver completed a receptive and expressive vocabulary checklist.

Results

Nine of the 12 participants sorted one or more categories. They sorted categories with identical members more frequently than those with non-identical members, $t(11) = 3.58$, $p<.01$, 2-tailed (t-test for correlated groups). They sorted global and basic level categories with equal frequency, $t(11) = 0.00$, n.s., 2-tailed (t-test for correlated groups).

There was no relationship between the number of categories sorted and any of the language measures: receptive vocabulary task ($r = .21$, n.s.), expressive vocabulary task ($r = .03$, n.s.), receptive vocabulary inventory ($r = .05$, n.s.), expressive vocabulary inventory ($r = .01$, n.s.).

Discussion

For these participants with mental retardation, only perceptual similarity influenced categorization. Nine of twelve were able to sort categories with identical members, an ability that is associated with the onset of the naming explosion in typically developing infants and toddlers (Gopnik and Meltzoff, 1987, 1992). The implications of this finding for this population, as well as for the development of categorization generally, need to be explored.

Categorization in adults with severe to profound mental retardation

Pam Lewis- University of Wisconsin at Madison

Biennial meetings of the Society for Research in Child Development- Minneapolis, Minnesota
April 20, 2001

THE QUESTIONS

1) What is the relationship of thought to language?

2) What are the universals of development?

* * * * *

Categorization is a basic cognitive process.

Universals bridge atypical and typical populations.

Therefore, two more specific questions are:

1) How do categories develop?

in atypical as well as typical populations

2) What is the relationship of category development to language development?

in atypical as well as typical populations

In this study, I asked:

1a) What factors affect categorization in adults who are nonverbal due to mental retardation?

1b) Are these factors the same as for typically developing infants?

2a) Is there a relationship between categorization skills and language development in adults who are nonverbal due to mental retardation?

2b) Is this relationship the same as for typically developing infants?

IMPORTANCE of RESEARCH with ADULTS with SEVERE to PROFOUND MENTAL RETARDATION

Theory

1) To better understand universals of development, by identifying constants across populations.
2) To better understand developmental processes, through observed differences across populations.

For example, two nonverbal populations are:

1. prelinguistic infants
2. some adults with severe to profound mental retardation

Very little is known about how the cognitive development of these two groups compares. The number of studies on adults with severe to profound mental retardation is disproportionaely low, even given their small percentage of the total population (approximately .1%). A recent literature search yielded no hits at all.

Intervention

Approximately 275,000 in the U.S. are at this level of mental retardation.

Vocational and residential programs would benefit from intervention programs which could be developed with greater knowledge.

BACKGROUND

How categories develop

In typically developing infants, categorization has been linked to:

1. level of inclusiveness of the category (Mandler and Bauer, 1988; Mandler, Bauer, and McDonough, 1991; Mandler and McDonough, 1993; Poulin-Dubois, Graham and Sippola, 1995; Rosch, 1978).
2. physical similarity of category members (Madole and Oakes, 1999; Oakes, Coppage, and Dingel, 1997; Quinn, Eimas and Rosenkrantz, 1993)

Relationship of language development to category development

In typically developing infants and toddlers:

A positive link has been found between categorization skills and vocabulary development (e.g., Gopnik and Meltzoff, 1987, 1992; Mervis and Bertrand, 1994; Poulin-Dubois, Graham, and Sippola, 1995; Shore, Dixon, and Bauer, 1995).

In atypical populations:

Children with Williams syndrome show a vocabulary spurt without categorization (Mervis and Bertrand, 1993).

Children with mental retardation, and autism showed no link between receptive language and categorization (Ungerer and Sigman, 1987).

METHOD

Participants

--12 adults with severe to profound mental retardation from a large midwestern congregate living facility

-- 1 had an additional dx of Autistic Disorder.

--Level of language development was measured with a language task administered by the E, and a language survey filled out by a familiar caregiver. Each had no more than 100 words of expressive language (including manual signs). Most had far fewer.

--Ages of all but two ranged from 18-42 years, with one who was 79 years old and one who was 63.

See Table 1.

Stimuli

Miniature objects from global and basic level categories, as well as "nonlinguistic" categories of geometric shapes (clothespins, blocks, rectangular sponges, round lids), and a category contrast of airplanes and winged animals.

See Table 2, and Figure 1.

Procedure

Categorization

1) 10 trials were presented, each consisting of a category contrast.
2) On each trial, 8 objects were presented in a row, 4 from each of two categories, with the items from each category alternating with each other
3) Each trial lasted 2 minutes.
4) Participants were urged to "fix them up," or "what can you do with all of these?"
5) The entire procedure was videotaped for later scoring.
6) Sorting by category was the dependent measure (the members of at least one of the two categories in that contrast had to be placed clearly separate from the others).

Choice of dependent measure

Unlike typically developing infants and toddlers, these adults with severe to profound mental retardation tended to exhibit little behavior. They required frequent urging to touch the objects and praise after doing so each time. There were not a sufficient number of touches to use a sequential touching paradigm (e.g., Starkey, 1981; Sugarman, 1981), however sorting into groups occurred relatively often, hence the choice of dependent measure.

Language

Inventory: Caregivers were given a vocabulary inventory similar to the MCDI (1993).

Task: 1) Pictures of objects from the same categories as the categorization task were presented 3 at a time.
2) Participants were asked to name each, and then were requested to touch each one as it was named.
3) The procedure was videotaped for later scoring.

Receptive and expressive vocabulary sizes were obtained from the inventory and from the language task.

RESULTS

Only perceptual similarity influenced categorization. Participants sorted categories with identical members more frequently than those with non-identical members, $t(11) = 3.58$, $p < .01$, 2-tailed (t-test for correlated groups). See Table 3.

Level of inclusiveness did not influence categorization. Participants sorted global and basic level categories with equal frequency, $t(11) = 0.00$, n.s., 2-tailed (t-test for correlated groups). See Table 3.

There was no relationship between the number of categories sorted and any of the language measures: receptive vocabulary task ($r = .21$, n.s.), expressive vocabulary task ($r = .03$, n.s.), receptive vocabulary inventory ($r = .05$, n.s.), expressive vocabulary inventory ($r = .01$, n.s.). Additional analyses were done with only nominals, which are a subset of total vocabulary. No relationship was found between number of categories sorted and either receptive nominals ($r = -.11$, n.s.) or expressive nominals ($r = .00$, n.s.). See Table 4.

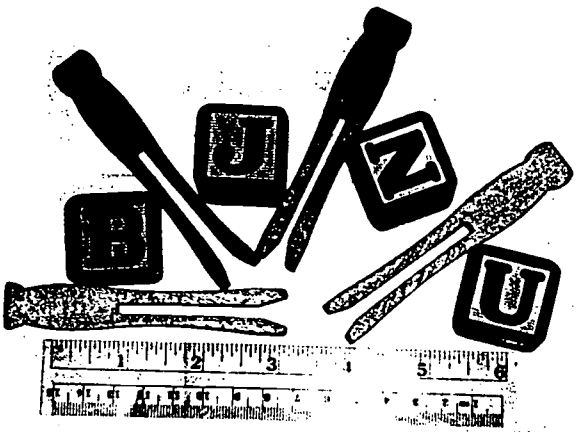
DISCUSSION

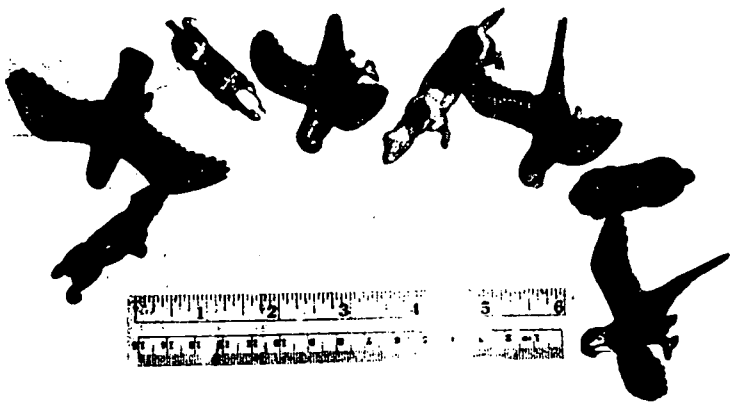
1. demonstration of a viable procedure for studying categorization in this population
2. support for similarity as more important than level of inclusiveness in the development of categories
3. lack of support for connection between language development and categorization
4. possibly no longer a connection once categorization and language skills are no longer developing
5. are these skills still developing in this population?

Figure 1

Sample Category Contrasts

Identical
Nonlinguistic





Nonidentical
Basic

Nonidentical
Global

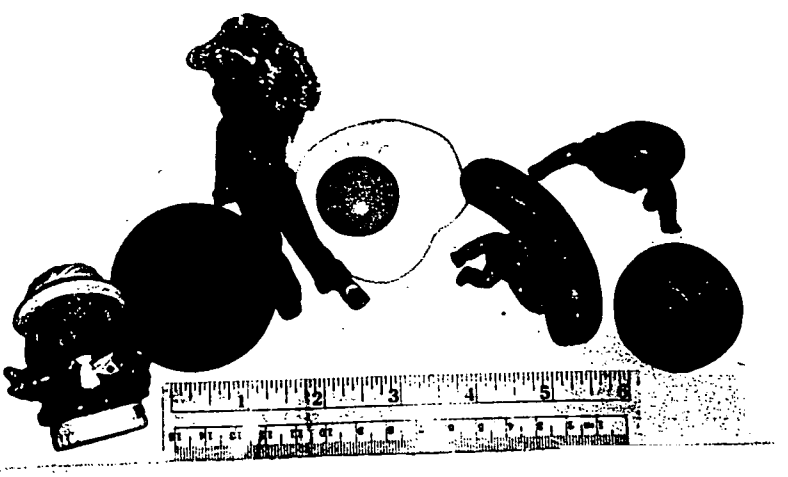


Table 1: Participant characteristics

Participant # and age	Diagnosis	Receptive task: # identified (of 27)	Expressive task: # identified (of 27)	Receptive vocabulary size by inventory	Expressive vocabulary size by inventory
1 29 yr.	severe-profound	1	0	57	12
2 23 yr.	profound	4	0	87	13
3 79 yr.	severe	0	0	37	71
4 63 yr.	severe	0	1	269	4
5 25 yr.	severe	23	0	224	43
6 24 yr.	profound	3	0	340	4
7 28 yr.	profound	22	0	116	19
8 42 yr.	severe	2	0	57	1
9 39 yr.	profound	9	0	224	37
10 26 yr.	severe; autism	27	0	295	17
11 18 yr.	profound	27	0	358	19
12 41 yr.	profound	1	0	0	0

Table 2: Characteristics of Categories Used

Objects	Category level	Identical members?
sponges/caps	nonlinguistic	yes
blocks/ clothespins	nonlinguistic	yes
cars/trucks	basic	yes
cars/trucks	basic	no
dogs/birds	basic	yes
dogs/birds	basic	no
furniture/vehicles	global	no
winged animals/airplanes	global	no
food/people	global	no
girls/cookies	global	yes

Table 3: Number of Categories Grouped, by Type

Partici-pant Number	Identical mem-bers (of 5 sets)	Non-identical members (of 5 sets)	Basic (of 4 sets)	Global (of 4 sets)	Non-linguis-tic (of 2 sets)	Total # of categories sorted (of 10 sets)
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	1	0	0	0	1	1
4	2	0	0	0	2	2
5	2	0	0	1	1	2
6	0	0	0	0	0	0
7	5	1	3	1	2	6
8	5	0	2	1	2	5
9	3	0	1	1	1	3
10	1	0	0	0	1	1
11	1	0	0	1	0	1
12	1	0	0	1	0	1

Table 4: Vocabulary, Nominals, and Total Number of Categories Sorted

Partici-pant #	Recep-tive vo-cabulary: inventory	Expres-sive vo-cabulary: inventory	Recep-tive nominals: inventory	Expres-sive nominals: inventory	Recep-tive vo-cabulary: task (of 27)	Expres-sive vo-cabulary: task (of 27)	Total categor-ies sorted (of 10 sets)
1	57	12	35	1	1	0	0
2	87	13	55	3	4	0	0
3	37	71	31	56	0	0	1
4	269	4	166	0	0	1	2
5	224	43	165	38	23	0	2
6	340	4	218	4	3	0	0
7	116	19	100	10	22	0	6
8	57	1	38	2	2	0	5
9	224	37	140	18	9	0	3
10	295	17	195	8	27	0	1
11	358	19	236	10	27	0	1
12	1	0	0	0	1	0	1

REFERENCES

Gopnik, A. and Meltzoff, A. (1987). The development of categorization in the second year and its relation to other cognitive and linguistic developments. Child Development, 58, 1523-1531.

Gopnik, A. and Meltzoff, A. (1992). Categorization and naming: basic-level sorting in eighteen-month-olds and its relation to language. Child Development, 63, 1091-1103.

MacArthur Communicative Development Inventory: Words and Gestures (1993). San Diego, CA: Singular Publishing Group, Inc.

Madole, K. and Oakes, L. (1999). Making sense of infant categorization: stable processes and changing representations. Developmental Review, 19, 263-296.

Mandler, J. M. and Bauer, P. J. (1988). The cradle of categorization: is the basic level basic? Cognitive Development, 3, 247-264.

Mandler, J. M., Bauer, P.J., and McDonough, L. (1991). Separating the sheep from the goats: differentiating global categories. Cognitive Psychology, 23, 263-298.

Mandler, J.M., and McDonough, L. (1993). Concept formation in infancy. Cognitive Development, 8, 291-318.

Mervis, C.B., and Bertrand, J. (1993). General and specific relations between early language and early cognitive development. Paper presented at the biennial meetings of the Society for Research in Child Development, New Orleans.

Oakes, L.M., Coppage, D. J., and Dingel A. (1997). By land or by sea: the role of perceptual similarity in infants' categorization of animals. Developmental Psychology, 33(3), 396-407.

Poulin-Dubois, D., Graham, S., and Sippola, L. (1995). Early lexical development: the contribution of parental labelling and infants' categorization abilities. Journal of Child Language, 22, 325-343.

Quinn, P.C., Eimas, P.D., and Rosenkranz, S.L. (1993). Evidence for representations of perceptually similar natural categories by 3-month-old and 4-month-old infants. Perception, 22, 463-475.

Rosch, E . (1978). Principles of categorization. In E. Rosch and B.B. Lloyd (ed.s). Cognition and categorization. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Starkey, D. (1981). The origins of concept formation: Object sorting and object preference in infancy. Child Development, 52, 489-497.

Sugarman, S. (1981). The cognitive basis of classification in young children: An analysis of object-ordering trends. Child Development, 52, 1172-1178.

Ungerer, J. A. and Sigman, M. (1987). Categorization skills and receptive language development in autistic children. Journal of Autism and Developmental Disorders, 17 (1), 3-16.

ACKNOWLEDGMENTS

I would like to thank the adults who participated in this study as well as their guardians for giving consent for their participation. I would also like to thank Len Kobliska and the staff at St. Coletta's in Jefferson, Wisconsin, for assistance in identifying participants and for scheduling them. I also want to thank the following people for valuable discussion and comments: Len Abbeduto, Jill Chafetz, Susan Riley, and Eve Wilkie.

Pam Lewis
lewis@waisman.wisc.edu
157 Waisman Center
University of Wisconsin at Madison
1500 Highland Ave.
Madison, WI 53705-2280

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Categorization in adults with severe to profound mental retardation

Author(s): Pamela F. Lewis

Corporate Source: —

Publication Date: —

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1 ↑ ☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A ↑ ☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B ↑ ☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: Pamela F. Lewis	Printed Name/Position/Title: Pamela F. Lewis
Organization/Address: 157 Waisman Center - U.W. Madison, 1500 Highland Ave. Madison, WI - 53705-2280	Telephone: 608-263-9670 FAX:
	E-Mail Address: lewis@waisman.wisc.edu Date: 4-23-01

2 ennial Mtg. of the Society for Research in Child Dev. (Minn, MN, Apr. 19-22, 2001) (over).

ERIC/
EECE

Make sure your work is included in the ERIC database...

Providing information since 1967 about the development, education, and care of children from birth through adolescence

ERIC Clearinghouse on Elementary and Early Childhood Education (ERIC/EECE)

University of Illinois
Children's Research Center
51 Gerty Drive
Champaign, IL 61820-7469

ericeece@uiuc.edu (email)
http://ericeece.org (Web)

800-583-4135 (voice/tty)
217-333-1386 (voice)
217-333-3767 (fax)

April 17, 2001

Dear Colleague:

It has come to our attention that you will be giving a presentation at the ***2001 Biennial Meeting of the Society for Research in Child Development*** to be held in Minneapolis, Minnesota, on April 19-22, 2001. We would like you to consider submitting your presentation, or any other recently written education-related papers or reports, for possible inclusion in the **ERIC** database.

As you may know, **ERIC (the Educational Resources Information Center)** is a federally sponsored information system for the field of education. Its main product is the **ERIC** database, the world's largest source of education information. **The Clearinghouse on Elementary and Early Childhood Education** is one of 16 subject-specialized clearinghouses making up the **ERIC** system. We collect and disseminate information relating to all aspects of children's development, care, and education.

Your paper should be at least 8 pages long and not published elsewhere at the time of submission. **Announcement in ERIC does not prevent you from publishing your paper elsewhere** because you still retain copyright. The reproduction release is simply a tracking device for us to know the level of availability you want for your material. Your paper will be reviewed, and we will let you know within 6 weeks if it has been accepted.

Please sign the *reproduction release on the back of this letter* and return it with an abstract and two copies of your presentation to **Booth #20**, or mail it to **ERIC/EECE**. If you have any questions, please contact me by *phone at (217) 333-1386 or by email at ksmith5@uiuc.edu.* I look forward to receiving your paper.

Best wishes,

Karen E. Smith

Karen E. Smith
Assistant Director