Extension of the Audio-Visual Combination Discrimination Test

Valerie R. Davine
Western Michigan University

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EXTENSION OF THE AUDIO-VISUAL COMBINATION
DISCRIMINATION TEST

by

Valerie R. Davine

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
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EXTENSION OF THE AUDIO-VISUAL COMBINATION DISCRIMINATION TEST

Valerie R. Davine, M.A.
Western Michigan University, 1990

The Audio-Visual Combination (AVC) scale (Kerr, Meyerson, & Flora, 1977) was developed to assess basic discrimination skills in the developmentally disabled population. Acquisition of such skills has been demonstrated to follow a progressive pattern. The existing AVC test assesses discrimination skills in the following hierarchy: Imitation, Position, Visual, Match-To-Sample, Auditory, and Auditory-Visual Combination. This investigation attempted to discover transitional skills between the Match-To-Sample and the Auditory levels. Twenty-four developmentally disabled adults were tested using the original AVC tool with the addition of four new discrimination tasks that were added to the existing scale to ascertain a finer gradation of skills. Results showed that the new discrimination skills are not, in fact, intermediary, except possibly for one form of a visual nonidentity match-to-sample task.
ACKNOWLEDGMENTS

I express a very special acknowledgment to Dr. Jack Michael, my advisor and committee chair, whose encouragement and direction formed a vital foundation for my graduate studies. His analytical approach and positive commitment to the field serve as a model for me. I deeply appreciate his genuine interest in my progress.

It is with gratitude that I acknowledge Dr. Joel Macht, Associate Professor of Educational Psychology at the University of Denver. His methodology and achievements, which I observed first-hand, inspired my decision to pursue graduate work in my chosen field. His valuable guidance and counsel underscored his faith in me.

Sincere thanks is extended to my friend and fellow student, Mike Urbach, for his constant encouragement and assistance.

I am grateful to my parents, who fostered my desire to maintain an open mind and to persevere. It is my family's unfailing belief in me that helped me bring this project to completion.

Valerie R. Davine
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Davine, Valerie R., M.A.

Western Michigan University, 1990

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>v</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>The Audio-Visual Combination Test</td>
<td>1</td>
</tr>
<tr>
<td>Research Objective</td>
<td>7</td>
</tr>
<tr>
<td>II. METHOD</td>
<td>10</td>
</tr>
<tr>
<td>Subjects</td>
<td>10</td>
</tr>
<tr>
<td>Setting and Reinforcers</td>
<td>10</td>
</tr>
<tr>
<td>Reliability</td>
<td>11</td>
</tr>
<tr>
<td>Experimental Procedure</td>
<td>12</td>
</tr>
<tr>
<td>Response Definition</td>
<td>20</td>
</tr>
<tr>
<td>Pass/Fail Criterion</td>
<td>21</td>
</tr>
<tr>
<td>III. RESULTS</td>
<td>23</td>
</tr>
<tr>
<td>Phase I</td>
<td>23</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>23</td>
</tr>
<tr>
<td>New Tasks</td>
<td>24</td>
</tr>
<tr>
<td>Phase II</td>
<td>25</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>25</td>
</tr>
<tr>
<td>New Tasks</td>
<td>25</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>26</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>26</td>
</tr>
<tr>
<td>New Tasks</td>
<td>29</td>
</tr>
</tbody>
</table>
Table of Contents--Continued

CHAPTER

IV. DISCUSSION ........................................ 32
    Hierarchy ........................................ 32
    New Tasks ........................................ 34
    Future Research .................................. 38

APPENDICES

A. Data Recording Forms ................................ 40
B. Protocol Letter From Human Subjects Institutional
    Review Board ........................................ 49

BIBLIOGRAPHY ............................................... 51
LIST OF TABLES

1. Phase I. Lower Functioning Subjects ........................ 13
2. Phase II. Higher Functioning Subjects ...................... 14
CHAPTER I

INTRODUCTION

The Audio-Visual Combination Test

Individuals categorized as mentally retarded comprise a very heterogeneous group, making skills assessment and subsequent classroom and/or vocational training a difficult matter (Wacker, Steil, & Greenebaum, in press). The Audio-Visual Combination (AVC) measurement of discrimination (or learning to learn) skills was developed by Kerr, Meyerson, and Flora (1977) as a relatively quick and inexpensive means of assessing basic discrimination skills required for many classroom, vocational, and daily living tasks. The tasks completed during the test reflect the individual's ability to perform such tasks as going to a bus that is always in the same place, putting dirty clothes in a hamper, sorting by shape and/or color, or following verbal instructions.

The AVC test divides the discrimination skills into the following six levels:

Level 1: Imitation. At this level, the subject imitates the experimenter in the placement of a white piece of rubber foam into either a yellow can or a red box, placed one at a time in front of the subject. For example, the red box alone is on the table in front of the subject, and he or she is required to put the foam into the box after the experimenter has demonstrated the response. This
discrimination level resembles many early teaching programs in which the learner is expected to imitate what the instructor has just demonstrated (Kerr et al., 1977).

Level 2: Position. During this task, both containers are in front of the client in the same position for each trial, and the subject is supposed to place the foam into the same container (the yellow can) at each trial. Many times items remain in relatively fixed positions, and the individual is expected to respond appropriately to an object's location (i.e., toys in a box, clothes in a hamper). According to Kerr et al. (1977), this is not a purely visual discrimination because a correct response is not necessarily dependent on visual feedback. Assuming the individual has been well trained to put something in a container that is consistently in a fixed position, he or she could conceivably respond correctly without looking.

Level 3: Visual. At this level the two containers are presented in randomized left-right positions, and the subject is required to put the rubber foam into the yellow can (as in Level 2, Position) on each trial. In this type of discrimination, the subject is required to observe the discriminative stimulus (sD) in relation to other stimuli (Kerr et al., 1977). This would be similar to picking up a fork regardless of its position in relation to other utensils.

Level 4: (Identity) Match-To-Sample. During this assessment the containers alternate positions randomly as in Visual discrimination (Level 3 above), and the subject is required to put a small
yellow cylinder into the yellow can and a small red cube into the red box. The cylinder and cube are given to the subject in random order at each trial. Many tasks require this kind of discrimination in which the correct response depends on what sample stimulus is present. In Identity Match-To-Sample, the sample stimulus physically resembles the comparison stimulus to be selected. When the tester hands the subject the red cube (sample stimulus), he or she is to put it in the red box (one of the two comparison stimuli). The correct response is conditional upon which of the two smaller objects the subject is given. At this level, the sample stimulus (or $S^D$ as it will sometimes be referred to) is similar in shape and color to the correct comparison stimulus. This type of conditional discrimination occurs in daily living and vocational tasks when an individual is required to sort objects by shape or size, or places like items on a shelf labeled with a matching picture (Kerr et al., 1977).

Level 5: (Vocal) Auditory. Here the containers are in a stable position in front of the subject and the subject puts a piece of white rubber foam into either the yellow can or the red box depending on the randomly delivered, examiner-spoken $S^D$ ("red box" or "yellow can"). This is another example of a conditional discrimination, only in this case the correct response is dependent upon a sample stimulus that does not resemble either comparison stimulus. The words "red box" do not physically resemble the actual red box. This is a more difficult conditional discrimination because of this arbitrariness. However, responding under control of verbal stimuli is a common and needed skill for most vocational and daily living responsibilities.
Kerr et al. (1977) maintained that Level 5 discrimination does not require visual feedback since the two containers remain in the same position. Essentially, a person who is blindfolded could be trained to put the foam into the appropriate container based on the verbal command (i.e., "red box") as long as the red box is consistently on one side. However, under the investigated circumstances using only sighted subjects, it seems that visual stimulation is relevant to making a correct response.

Level 6: Auditory-Visual Combination. At this level the containers are presented in randomly alternating left-right positions. As in Level 5, the subject places the foam into the correct container based on the examiner-spoken, random $S^D$. This nonidentity conditional discrimination involves not only an arbitrary, or symbolic, relation between the sample and comparison stimuli, but also straightforwardly encompasses two sense modes (visual and auditory). This is a fairly common type of discrimination required in vocational, classroom, and daily living responsibilities.

Since its inception, the AVC test has been repeatedly studied, and results of these investigations have demonstrated that discrimination skills appear to be acquired hierarchically (Martin, Yu, Quinn, & Patterson, 1983; Tharinger, Schallert, & Kerr, 1977; Wacker, 1981; Wacker, Kerr, & Carroll, 1983; Wacker et al., in press; Yu & Martin, 1980; Yu, Martin, & Williams, in press). In other words, subjects in the previous investigations who failed at a certain level of discrimination passed all lower discrimination levels, yet failed all of the tasks above the one failed. For example, subjects who
failed Level 5 (Vocal Auditory), but passed Level 4, Identity Match-To-Sample, also passed Levels 1 (Imitation), 2 (Position), and 3 (Visual), while failing Level 6 (Vocal Auditory-Visual Combination).

The AVC test provides a methodology with which to assess the developmentally disabled individual's present performance level, thus enhancing placement into more homogeneous training groups (Wacker et al., 1983; Wacker et al., in press; Yu et al., in press). Subdividing subjects in this manner has also facilitated investigations of training methods to determine which procedure is most productive in teaching the level failed, an acquisition that is usually very difficult for the subject (Witt & Wacker, 1981, Yu & Martin, 1980). The AVC scale's predictive abilities allow accurate placement into vocational and learning groups where success is more immediate (Martin et al., 1983; Tharinger et al., 1977; Wacker et al., 1983; Wacker et al., in press) while training on the higher, failed levels can be continued using specialized training procedures.

In research involving the use of the AVC test with hearing impaired clients, visual manual signs were used at Levels 5 and 6 instead of the spoken auditory commands. Wacker (1981) is the only researcher who discussed prior signing experience of his subjects, who had had unsuccessful oral/lip reading training, and were now considered candidates for ongoing sign language programming.

In both studies involving hearing impaired, mentally retarded subjects, the same hierarchy evolved with visual sign discriminations (at Levels 5 and 6) being the most difficult tasks (Kerr & Meyerson, 1977; Wacker, 1981). In spite of the fact that in these
investigations the modality of the $S^D$ in Levels 5 and 6 was visual, rather than vocal-auditory as in previous studies, the same pattern as the earlier investigations emerged. Kerr and Meyerson (1977) remarked that this may be because both the auditory $S^D$s and the manual sign $S^D$s represent a higher level of symbolism than matching like objects. In Level 4 the stimulus that indicates where the object should be placed is physically similar to the object—the small red cube is to be placed in the large red box and the small yellow cylinder in the large yellow can. In Levels 5 and 6, whether a vocal auditory or a signed instruction is given, there is no physical similarity between the correct location for the object and the stimulus that tells the subject where the object is to be placed. There is no physical similarity between the auditory vocal word "yellow can" and the yellow can itself, and similarly for "red box" and the red box. The same is true when a visual sign for yellow can and red box is used as the instruction. In other words, Level 4 is an instance of what is called identity matching, and Levels 5 and 6 are nonidentity, or symbolic, matching.

Levels 5 and 6 are also more difficult than Level 4 in that the sample stimulus that tells the subject where to put the object is continuously present in Level 4 (the physical appearance of the object that is in the subject's hand), whereas in Levels 5 and 6 the sample stimulus is transient (the experimenter saying "yellow can" and "red box"). It is not clear from the description of the procedure involving a signed instruction whether the hand sign was held while the subject placed the white piece of rubber foam in the
appropriate container or not (Kerr & Meyerson, 1977).

Although Levels 5 and 6 may be more difficult than Level 4 because the Level 4 task involves only visual stimuli, whereas Levels 5 and 6 require simultaneous visual and auditory stimulus control, there are these other two factors which may contribute to the difference in difficulty—nonidentity versus identity matching and a continuously present stimulus versus a transient one—that confound the interpretation of the two different kinds of tasks. Said another way, the Level 4 task is easier than the Level 5 and 6 tasks not only because it involves just a single sense mode, but also because it is identity matching rather than nonidentity, and because one of the controlling stimuli is transient in Levels 5 and 6, but continuously present in Level 4.

This analysis implies that there may be transitional skills intermediate between Level 4 and Levels 5 and 6 which are, in a sense, overlooked in the rationale for the AVC test. Thus, some of those who pass 4 but fail 5 and 6 may be unable to perform a nonidentity match, even if it consists entirely of visual stimuli, whereas some may be capable of the nonidentity match with visual sample and comparison stimuli but incapable of the cross modal stimulus control. The relevance of the transience of one of the controlling stimuli is also unclear with the present version of the AVC test.

Research Objective

The purpose of this study was to determine if the AVC scale failed to include intermediate steps that are pivotal to the
acquisition of skills needed to make the auditory level discrimina-
tions. To accomplish this objective, this investigation added the
following steps to the AVC when testing subjects.¹

Task 7: Visual (kinesthetic and tactile) Nonidentity Match-
To-Sample. While being tested for this discrimination, the subject
held objects that were physically unrelated to the containers (i.e.,
a black haired troll doll to be placed in the red box and a small
black car to be placed in the yellow can). This is an arbitrary
conditional discrimination in which the sample stimulus, at this
level held by the subject as in Task 4 (Identity Match-To-Sample), is
unlike the correct comparison stimulus to be selected.

Task 8A: Visual, Nonidentity Match-To-Sample. Here the piece
of rubber foam was on the table in front of the subject. Placement
into the correct container was based on which of two objects that
were physically unrelated to the containers was held up by the exper-
imenter. The sample stimulus was shown to the subject until a re-
response was made. Again this is a symbolic conditional discrimination
since the $S^D$ did not physically resemble the correct comparison stim-
ulus.

Task 8B: Visual, Nonidentity Match-To-Sample. During this
assessment, the rubber foam was placed in front of the subject on a
piece of carpet. The carpet was the sample stimulus and a correct

¹It would have been possible to number the new tasks in such a
way as to indicate that they were transitional between Levels 4 and
5, for example, 4.1, 4.2, etc. However, as will be addressed in the
results section, these new steps are not all intermediate. There-
fore, they are numbered 7 through 9 to show they are different from
the original tasks.
response was dependent upon which piece of carpet (with the foam sitting on it) was put in front of the subject. Again this was an arbitrary conditional discrimination because the carpets did not physically resemble either of the containers. This discrimination is similar to Task 8A above, except here the subjects were more likely to look at the $S^D$ (the piece of carpet) as they picked up the foam to make the response. In Task 8A, above, the subject could conceivably pick up the foam and place it into a container without ever looking at the sample stimulus being held up by the examiner.

Task 9: Continuous, Nonvocal Auditory. In testing this discrimination skill, the nonword and nonhuman sounding auditory $S^D$s remained until a response was made. The sounds used were a rattling sound from a typical baby rattle shaken under the table out of the subject's view, and a squeaky sound from a child's plastic toy that squeaked when squeezed, again under the table and out of sight to avoid any inadvertent visual clues. This task was unlike Tasks 5 and 6 (Vocal Auditory and Vocal Auditory-Visual) in two ways. First, the sound remained present until the subject made a response, and second the sounds were not words nor were they produced by the human voice.
CHAPTER II

METHOD

Subjects

Twenty-four mentally retarded adults were used for this study, 17 men and 7 women. Diagnoses ranged from mildly retarded to severely retarded; none was profoundly retarded. Some resided in a large residential facility while others lived in smaller group homes in Denver, Colorado. Several had physical handicaps (wheelchair bound, movement disorders, potential seizures), but none that interfered with their ability to perform the tasks in this experiment.

Setting and Reinforcers

The AVC assessment was administered at the individual's place of residence in a quiet area in which distractions were at a minimum. The subject sat at a table across from the experimenter. The observer sat away from the table and behind the subject (Kerr et al., 1977). Sessions lasted between 30 and 60 minutes.

Praise, such as "That's right!" "Good job, Joe!" along with smiling and occasionally clapping, was given after each correct response. Subjects selected from miniature graham crackers, M&Ms, goldfish crackers, and Garfield fruit candies after every fourth or fifth correct response, and usually at the end of testing an entire level. Correct responses during the correction procedure that
followed each error were neither scored nor reinforced with an edible (Kerr et al., 1977; Yu & Martin, 1980; Yu et al., in press). Such responses were, however, reinforced with the praise described above.

Reliability

An observer accompanied the experimenter to every session and took data on every trial for each subject. Training of the recording of subject and experimenter behavior began with observers reading the detailed definitions and instructions put forth by Kerr et al. (1977). In addition to observing subject responses, the observer also monitored the examiner to ensure that no extraneous cues (e.g., nodding toward a particular container, holding a visual sample stimulus closer to its respective container) were given to the subject. In addition, the observer was to confirm that the experimenter completely removed the box and can from the subject's view and returned them to the table in the proper position (as per the recording sheet) for the next trial during those tasks that required random switching of the stimuli (Kerr et al., 1977; Wacker, 1981). Observers practiced scoring with role play, and only after 100% mastery did an observer accompany the experimenter to corroborate scoring during the actual procedure.

There was 100% agreement between observer and experimenter for every trial of every task for each subject. This interobserver agreement may be spuriously high, however, because observers were with the experimenter while scoring was done. Thus, the observer could generally hear whether the experimenter had reinforced the
subject's response. Observers were instructed to comment on any disagreements. Additionally, the type of response was such that incorrect scoring would be unlikely. The only time there might have been difficulty in correctly scoring a response was if the subject placed his hand into a container without letting go, and then, after a moment switched to the other container. In that situation there may be some question as to which response should be scored. This type of responding occurred approximately 15 times over the entire investigation. In the future, a video camera should be used during the assessment and observers should score responses when the video tapes are played without sound.

On occasion, the examiner did not place the containers on the table as dictated by the data sheets for that trial. When that occurred, the observer told the experimenter as soon as that trial was over, and both made notes on their data sheets as to how the containers had been placed for that trial.

Experimental Procedure

The experiment was divided into two phases (see Tables 1 and 2). Phase I consisted of an attempt to confirm or disconfirm that Tasks 7 through 9 were intermediate steps between Levels 4 and 5. Lower functioning subjects were used for this phase and were so categorized because they could not read or write and spoke in one or two word phrases if they were able to speak at all. They had very few, if any, signs in their repertoire.
### Table 1

#### Phase I. Lower Functioning Subjects

<table>
<thead>
<tr>
<th>Tasks</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>Task 1. Imitation. One container at a time.</td>
<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
</tr>
<tr>
<td>Task 4. Identity Match-To-Sample. Small can and small box as $S^D$ objects.</td>
<td>P(4)</td>
<td>P(8)</td>
<td>F(2)</td>
<td>F(9)</td>
<td>P(3)</td>
<td>P(9)</td>
</tr>
<tr>
<td>Task 5. Auditory. Examiner-spoken word (&quot;red box&quot; or &quot;yellow can&quot;) $S^D$. Containers in stable position.</td>
<td>P(5)</td>
<td>F(4)</td>
<td>F(3)</td>
<td>F(5)</td>
<td>F(7)</td>
<td>P(2)</td>
</tr>
</tbody>
</table>

**Note.** $P$ = pass (eight consecutive correct responses before subject has accumulated eight incorrect responses before subject has made eight consecutive correct responses). The null tasks were administered.
Table 1

Phase I. Lower Functioning Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<tr>
<td></td>
<td>P(1)</td>
<td>P(1)</td>
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<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
<td>P(1)</td>
<td></td>
<td></td>
<td>P(9)</td>
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<td></td>
<td>F(2)</td>
<td>P(9)</td>
<td>P(3)</td>
<td>P(9)</td>
<td>P(2)</td>
<td>P(6)</td>
<td>P(2)</td>
<td>F(2)</td>
<td>P(1)</td>
<td>P(1)</td>
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<td>F(7)</td>
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<td>F(8)</td>
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<td>P(8)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>F(3)</td>
<td>F(7)</td>
<td>F(4)</td>
</tr>
</tbody>
</table>

Before subject has accumulated eight incorrect responses. \( F = \) fail (eight cumulative correct responses). The numbers in parentheses indicate the order in which the
### Table 2
**Phase II. Higher Functioning Subjects**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
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<tr>
<td>Task 1. Imitation. One container at a time.</td>
<td>P(1)</td>
</tr>
<tr>
<td>Task 4. Identity Match-To-Sample. Small can and small box as SD objects.</td>
<td>P(9)</td>
</tr>
<tr>
<td>Task 5. Auditory. Examiner-spoken word (&quot;red box&quot; or &quot;yellow can&quot;) S. Containers in stable position.</td>
<td>P(2)</td>
</tr>
<tr>
<td>Task 7. Nonidentity Match-To-Sample. Subject holds SD objects.</td>
<td>F(6)</td>
</tr>
<tr>
<td>Task 8A. Nonidentity Match-To-Sample. Examiner holds SD objects from 7. Foam on table.</td>
<td>F(7)</td>
</tr>
<tr>
<td>Task 8A'. Nonidentity Match-To-Sample. Examiner holds SD objects unlike those used in 7. Foam on table.</td>
<td>F(6)</td>
</tr>
<tr>
<td>Task 8B. Nonidentity Match-To-Sample. Foam on piece of carpet SD.</td>
<td>F(5)</td>
</tr>
</tbody>
</table>

**Note.** P = pass (eight consecutive correct responses before subject has accumulated eight cumulative incorrect responses before subject has made eight consecutive correct responses indicate the order in which the tasks were administered.

*Second session.*
Table 2
Phase II. Higher Functioning Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>14</th>
<th>15</th>
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<td></td>
<td>P(9)</td>
<td>P(2)</td>
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<td>P(1)</td>
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<td>P(1)</td>
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<td>P(1)</td>
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<tr>
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<td>F(7)</td>
<td>P(4)</td>
<td>P(5)</td>
<td>P(6)</td>
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<td>P(3)</td>
<td>P(2)</td>
<td>P(4)</td>
<td>F(7)</td>
<td>P(2)</td>
</tr>
</tbody>
</table>

Correct responses before subject has accumulated eight incorrect responses). F = fail before subject has made eight consecutive correct responses). The numbers in parentheses were administered.
Phase II was an attempt to determine the pattern of Tasks 8 (nonidentity, experimenter-held S^D) and 9 (nonvocal auditory) since Phase I did not provide enough data on those levels. Additionally, all available subjects at the original facility had been tested, and within the district that had approved the research, only higher functioning individuals living in group homes were available as subjects. Subjects in Phase II all had high language skills (i.e., could write their names and could converse in full length sentences with the experimenter and observer). Two subjects who were originally part of Phase I were later changed to the Phase II group because they could write at least their names and spoke in lengthy phrases with the experimenter and others. Three subjects from Phase II were later added to the Phase I group because they could not write at all and were unable to utter more than a few words.

The order of the tasks was randomly administered for all subjects in both phases to avoid any sequencing effects. It is unclear whether any previous researchers made this same attempt. Those that included sequencing information in their articles (Wacker et al., 1983; Wacker et al., in press) reported that they tested the tasks in succession. To avoid improved performance at one level due to skills acquired at other levels, it seemed that a true measure of discrimination skill acquisition would require that the sequencing confound be eliminated.

All Phase I subjects, except the last three who were originally treated as part of Phase II, were given Tasks 1-6. As in the previous AVC assessment/training research (Kerr et al., 1977; Wacker,
1981; Wacker et al., 1983; Wacker et al., in press; Witt & Wacker, 1981; Yu & Martin, 1980), a 14 cm x 14 cm x 10 cm red box and a 15.5 cm x 17.5 cm yellow can served as the containers in which objects were placed by the subject. For Levels 1 (Imitation), 2 (Position), 3 (Visual), 5 (Vocal Auditory), and 6 (Vocal Auditory-Visual Combination), the object to be deposited into one of the containers was a 5 cm square-like piece of irregularly shaped, white rubber foam. For Level 4 (Identity Match-To-Sample), the objects placed into the red box and yellow can were a 5 cm x 5 cm x 5 cm red cube and a 9 cm x 4 cm yellow cylinder, which resembled the relevant containers. All Phase I subjects were given Task 7, Nonidentity Visual (and kinaesthetic/tactile) Match-To-Sample, in which a 7 cm high troll doll, made of squeezable beige rubbery plastic, with short black hair, was to be deposited in the red box, and an 11 cm long, black two-door Volkswagen Beetle model car, made of metal with doors that opened, was to go into the yellow can. (Which item went into which container varied among subjects to confirm that one object was not more easily correlated with a particular container.)

In Phase I, Subjects 1 through 9 were given Task 8A, Nonidentity Match-To-Sample discrimination involving a purely visual, but continuous sample stimulus held by the experimenter. The 5 cm piece of rubber foam was to be dropped into the red box if the examiner held up the troll doll from Task 7 until a response was made, and the foam was to be placed into the yellow can if the experimenter presented the black car. (Again this was varied to assure that one object was not more easily correlated with a particular container.)
Task 8A' was introduced during the middle of Phase II because the experimenter reasoned that the procedure in Task 8A of using $s^D$ objects like those in Task 7 was a confound. If the subject was given Task 8A, which used the same sample stimuli as Task 7, after he or she was given Task 7 (and many were), it seemed possible that the subject could have learned from that experience, making performance on 8A somewhat easier to accomplish. Since three subjects from Phase II were later determined to more accurately conform to the Phase I group because of their poor verbal skills, they had been given Task 8A', Nonidentity Match-To-Sample, involving purely visual, experimenter-held, continuous sample stimuli that were different from those used in Task 7. The rubber foam was to be deposited into the yellow can if the examiner held up a black, 29 cm hole punch until a response was made, and the foam was to be dropped into the red box if a 21 cm pair of black handled scissors was presented. (The match of objects was alternated between subjects to assure no ease of correlation.)

Task 8B was introduced toward the very end of Phase I because of the large failure rate with Task 8A. In Task 8A the sample stimulus is held by the experimenter away from the foam on the table. The subject could, in fact, pick up the foam and release it into a container without ever looking at the experimenter-held $s^D$ object. In 8B the rubber foam rests on the sample stimulus (a piece of carpet) that indicates into which container the foam is to be released. Under these circumstances, the subject was more likely to look at the $s^D$ (the carpet) as he or she picked up the foam. The experimenter
speculated that this change would make the task an easier one to perform than Task 8A. Subjects 9-13 of Phase I were given Task 8B, in which the rubber foam was presented on either a 35 cm x 26 cm piece of multicolored (though no yellow or red), geometrically patterned piece of carpet, or on a 20 cm x 26 cm piece of gray carpet with raised black bumps or squiggles. Which carpet corresponded to which container was varied to be sure that neither match made the task easier.

All 13 subjects of Phase I were given Task 9, nonvocal auditory discrimination with a continuous auditory SD, in which the 5 cm piece of irregularly shaped rubber foam was to be released into the red box when a 9 cm rubber hippopotamus squeaky toy was squeezed repeatedly under the table until a response was made. The foam was to be placed into the yellow can when a baby rattle was sounded out of the subject's view, and until he or she responded. The rattle was made of hard plastic with a round, 6 cm in diameter top, with items inside that made it sound something like a maraca.

Task 1, Imitation, was originally intended to screen subjects. If the subject could not pass Imitation, he or she would not be part of the study. No subject failed Task 1, and by the time Phase II began, Task 4, Identity Match-To-Sample, was used to screen subjects because anyone who had failed Level 4 in Phase I had also failed the new Tasks, 7 through 9. No one in Phase II, including those subjects later placed into Phase I, failed Task 4. Only Phase II Subjects 14 and 15 were given each task from 1 through 6 because they had originally been part of Phase I. No one else in Phase II received Task 1,
and only two others were given Task 2, Position; one because she had failed Task 3, and the other as part of a second session. Task 3, where the correct container was always the yellow can but the containers were randomly alternated, was given to every subject because it was the task that several subjects failed during Phase I, contradicting the previously established hierarchy. Task 5 was given to four subjects, two of whom were the original Phase I individuals; for the other two it was a warm-up for a second session. It was no longer regularly given during Phase II because of its similarity to Level 6 where the containers are switched at each trial, and because it provided no additional information regarding the new Levels 7 through 9.

Task 7, Nonidentity, Subject-Held, Match-To-Sample, was given to all 11 subjects in Phase II. Task 8A was given to the first eight, and Task 8A' was given to the last three. Task 8B was given to every Phase II subject, except Subject 14, who was originally too early in Phase I to have received it. All 11 Phase II subjects were tested on Task 9. Due to a misunderstanding, Subjects 10, 18, and 20 were erroneously not tested on Task 8A (examiner-held sample stimuli) after failing Task 7. Subjects 18 and 20 were retested at a later time. Other subjects (16, 17, 19) were reassessed at that time as well, and tasks given or regiven during a second session are so noted in Table 2. Many previous investigators had tested their subjects over more than one session, usually due to subject fatigue, with no adverse effects.
Response Definition

As outlined by Kerr et al. (1977), the creators of the AVC scale, the experimenter began the assessment of each level with a demonstration of the correct response. Following this demonstration, the examiner helped the subject to perform the task and then asked him or her to do the task independently prior to beginning the first scored trial for that level. After this demonstration procedure, a correct response was scored when the object was put into the appropriate container, or if the subject put his or her hand with the object into the container up to the wrist. For example, if, during presentation of the squeaky sound, the subject dropped the foam into the red box, or placed his or her hand with the foam into the box up to the wrist, a correct response was recorded. An incorrect response was scored if the subject put the object into the wrong container for that trial, except at Level 1 (Imitation), where an incorrect response was marked when the rubber foam was dropped anywhere except in the demonstrated receptacle. For example, if the subject placed the foam into the red box during Level 5 (Vocal Auditory) when the $g^D$ given was "put it in the yellow can," or if the subject placed his or her hand with the foam up to the wrist into the box, an incorrect response was recorded.

Incorrect responses were followed by a correction procedure that involved telling the subjects they were wrong, demonstrating the correct response, helping them make the correct response, and finally asking them to do it independently. If the subjects reacted
correctly when asked to make the response on their own, a correct response was not marked on the data sheet, but they were praised for good work. However, if another incorrect response was made, it was scored as such on the data sheet, with an underline to note that it was made during a correction trial. The correction procedure was then repeated. Each correct and incorrect response was registered by the examiner and an observer on data forms presented in Appendix A.

Pass/Fail Criterion

As in the previous research (Kerr et al., 1977; Witt & Wacker, 1981; Yu et al., in press), a subject is considered to pass a task when he or she has made eight correct responses in a row before making eight incorrect responses. A subject has failed a task when eight incorrect responses have been made in any order before eight consecutive correct responses have been made. It is important to keep in mind that although these numbers were chosen for a reason (statistically, eight consecutive correct responses will occur by chance only 4 times in 1,000 trials in a two-choice situation), there is still an arbitrary nature to them. Subjects may be inattentive during the session because they are physically uncomfortable unbeknownst to the experimenter, or they may be preoccupied or tired, and fail a task they would otherwise pass under different circumstances. If a subject is transitional in his performance at a given level, he or she may more easily pass under certain conditions and fail under other circumstances. This intermediate ability may
partially explain why some subjects passed tasks they later failed, and vice versa.
CHAPTER III

RESULTS

Results for each subject in Phase I are shown in Table 1. Table 2 displays the outcome for subjects in Phase II. Both tables show the order in which the tasks were given to each subject in parentheses next to the P (pass) or F (fail). Those individuals who either passed all tasks, or failed all tasks above Level 2 (like Subject 10), contribute no information.

Phase I

Hierarchy

Generally, the results correspond with earlier research showing that discrimination tasks become increasingly difficult to acquire as individuals progress from Level 1 through Level 6. However, there are a number of surprising irregularities, such as the three subjects (5, 8, and 13) who failed Task 3 but passed higher tasks. (It should be noted that Subject 13 did pass Task 3 when it was given at a later time.) Subject 2 failed Task 2 while passing some of the higher level tasks, and Subject 4 failed Tasks 4 and 5, while passing Level 6.
New Tasks

If the results had come out exactly as expected at the beginning of this research, of the subjects who passed Task 4 and failed Task 6, some would have failed 7 through 9, some would have passed 7 through 9, some 7 and 8, and some just 7. In fact these new levels do not appear to be intermediate steps at all, except possibly Task 7. Three of the subjects who passed 4 and failed 6 (Subjects 2, 5, and 7) did in fact pass Task 7, indicating the possibility of Task 7 as a transitional step. Two subjects (12 and 13) passed 4 and failed 6, but also failed 7, giving no further information about this step. In principle, Task 7 should have been easier than Tasks 5 and 6, but several subjects (4, 8, and 11) passed 6 and failed 7. If Task 7 were an intermediate step between Tasks 4 and 5/6, then those passing Level 6 should have also passed Task 7.

The difficulty of Task 8 was drastically underestimated. Just two people (Subjects 8 and 9) passed it in any of its forms, and Subject 9 only passed it the second time he was given the task.

It was hypothesized that Task 9, Nonvocal Auditory, would be easier than Tasks 5 and 6 because the $S^D$ would remain present until the subject made a response. That supposition was strongly refuted as only Subject 1 was successful at Level 9.
Phase II

Hierarchy

This group was not given each of Tasks 1-6, except for Subjects 14 and 15. Subject 20 was given Tasks 2, 3, 4, and 6, and like Subject 14, did not conform to the original hierarchy. Both Subject 14 and Subject 20 failed Task 3 while passing 4 and 6. (Subject 20 did pass Level 3 the second time it was given.)

New Tasks

With this group, the purpose was no longer to determine if the new steps were intermediary since that had already been disproved in Phase I, and no one in Phase II failed Level 6. Instead, the intent was to determine the relative difficulty of Tasks 7 through 9.

Task 7 remained the easiest of the new tasks for this group as well. The majority of the subjects (8 out of 11) passed it. Task 8A remained the most difficult task; merely three individuals (Subjects 16, 17, and 21) passed it, and none of the three given Task 8A' (where the $S^D$ objects differed from those used in Task 7 because the sample stimulus similarity may have confounded Task 8A performance) was able to pass it. More subjects are needed to determine if 8A' is in fact more difficult than 8A.

Task 8B (foam on carpet that served as sample stimulus) did appear to be considerably easier than either version of 8A with 6 of the 10 Phase II subjects given 8B passing it.
The difference between the lower (Phase I) and higher (Phase II) groups becomes evident at Task 9, Nonvocal Auditory discrimination. In Phase I only one person passed 9. Six subjects (14, 15, 17, 19, 21, and 22) in Phase II passed Task 9.

For higher functioning individuals who have passed Task 6, the relative difficulty of Tasks 7 through 9 puts Task 7 at the easiest level, followed by both 8B and 9, with Task 8A being the most difficult task to perform.

Quantitative Analysis

As previously mentioned, some subjects may fail a level under certain circumstances, yet pass that same discrimination under different conditions, especially if their skill level is neither high nor low with respect to that discrimination. Such a subject might be expected to pass, but only after six or seven errors, or to fail, but only after having made several runs of passes short of the required eight. Some of the hierarchy discrepancies may be the result of such an intermediate capability, but the pass-fail criterion of the AVC test does not constitute an actual quantitative assessment of the subject's skill level. For this reason, a further, more quantitative analysis of the data was attempted.

Hierarchy

Tables 1 and 2 show the subjects who did not follow the 1 through 6 hierarchy revealed by previous investigators. Subjects 4, 5, 8, 13, 14, and 20 passed levels that followed a level they had
failed. Subject 4 passed Tasks 1 through 3 (given as the first, fourth, and seventh tasks, respectively) without error, but failed Level 4 (as the ninth task) quickly, making only three correct responses, at most two correct in a row. He also failed Level 5 (as the fifth task), but very slowly this time. He made 27 correct responses, up to 7 in a row, before finally accumulating eight errors, none of which occurred during a correction trial. He passed Level 6 (given second) with only two errors, and one was during the correction trial. His failure at Level 4 remains somewhat unexplained, but perhaps Level 5, which, if anything, is easier than 6 because the containers remain in a stable position, was almost passed. It seems likely that if the subject were to attempt Task 5 again at a different time, he might pass it as easily as he did 6. It is interesting to note that Level 5 was given after Task 6, so instead of benefiting from the previous experience, perhaps the subject was confused or tired by the time he attempted Level 5.

Subject 5 failed Task 3 (as the ninth task) quickly; she had only two correct responses and they did not occur continguously. Yet she passed both Levels 1 and 2 (given first and fifth) error free. Task 4 (given third) was also passed error free. In this case, Level 3 did not seem to be transitional for the individual, and this more continuous type of analysis did not lead to anything unusual or borderline about her performance. Perhaps because it was given as the ninth task, after many difficult and abstract discriminations, the subject was puzzled by Task 3.
Subject 8 passed Level 2 (as the fourth task) with only one error, and passed Level 4 (as the sixth task) error free. He failed Level 3 (given seventh), which should be at a level of difficulty between Level 2, Position, and Level 4, Identity Match-To-Sample, discrimination tasks. However, he was slow to fail Task 3, Visual, with 21 correct responses, and up to six of those occurring consecutively. Perhaps under different circumstances he would pass Level 3.

Subject 13 passed Task 2 (given ninth) with one error and passed Task 4 (given first) error free. Task 3 was failed somewhat slowly the first time it was given (as the seventh task). He made 18 correct responses at that time, and as many as six of them were successive. When he was given Task 3 again as the 10th task, he passed it, having made five errors. This subject is an example of someone whose performance varied due to a practice effect or situational factors.

Subject 14 was a Phase II subject who passed Level 2 (as the fifth task) with one error. At Level 3 (as the eighth task) he failed, having made five correct responses, none of them in a row. Task 4 (given ninth) was almost failed; he made seven errors before finally executing eight consecutive correct responses. It does not seem that Task 3 was transitional, but it does appear that Task 4 was.

Subject 20 passed Task 2 (given sixth) with two errors, and passed Task 4 (given first) with one error. The first time he was tested on Level 3 (as the fifth task) he failed, but he had made 19 correct responses, up to 5 in a row, before failing. At the time, this subject would sometimes say out loud, "yellow can," but
occasionally still proceed to put the foam in the red box. At the second session, when he was given Level 3 again as the second task, he passed error free. Indeed this may have been a transitional task for him, and having another opportunity to do the task on a different day might have made the difference in his performance.

New Tasks

In this section, Task 7 will be looked at more closely. Because three subjects who passed Level 4 and failed 5/6 did in fact pass Task 7, it seems possible that Task 7 is an intermediate task. If that were the case, though, why wouldn't all subjects who passed Level 6 not also pass Task 7? In an attempt to clarify Task 7's position in the hierarchy of learning discrimination skills, the performance of those individuals who passed Levels 5/6 but failed Task 7 (Subjects 8, 11, 14, 18, and 20) is examined more closely.

Subject 8 slowly failed Task 3 (given seventh) and seemed to be at a transitional stage. He passed Task 4 (given sixth) error free, passed Task 5 (given ninth) after making five consecutive mistakes, and passed Level 6 (as the second task) error free. Interestingly, the first time he was given Task 8A (as the third task), he failed it. However, he had been interrupted by another client in the facility after having completed his seventh correct response in a row. (He made a total of 15 correct responses.) Because of that distraction, he was given 8A again as the 10th task, and that time he passed it error free. This is an example of how the situation surrounding the testing can make a difference. Task 7 was given as the eighth
task and failed. He made 15 correct responses, with a maximum of three correct responses in a row. This failure is somewhat inexplicable considering he passed Level 8A using the same discriminative stimuli.

Subject 11 passed Levels 4 and 6 (given first and fourth, respectively) error free. If Task 7 is an intermediate step between those two levels, this subject should have passed it easily. To the contrary, when it was given as the third task, he failed, having made five correct responses, with only two correct responses occurring successively.

Phase II Subject 14 had failed Level 3 (as the eighth task) rather quickly, passed Level 4 (as the ninth task) after having made seven errors (he was on the verge of failing), and passed Levels 5 and 6 (given second and fourth) with relative ease. He failed Task 7 (given sixth), having made only four correct responses, three of them in a row. Three times during the task, he would point to the correct container, but then drop the object into the wrong one. Task 8A was given immediately after Task 7 using the same sample stimuli, and here the subject made 12 correct responses, up to 6 of them consecutively, before failing. This may indicate that with practice, this person could have eventually mastered the discrimination.

Subject 18 passed Tasks 3, 4, and 6 (given fifth, first, and third) error free. He also passed 8B (as the sixth task) with only one error. Task 7 (given fourth) was failed with 17 correct responses. Seven consecutive correct responses were made after the subject had also accumulated seven incorrect responses. Therefore,
he was on the threshold of either failing or passing when he made the final error. When given 8A as the second task during a second ses-

sion, he failed having made nine correct responses, up to four of them in a row. It is unfortunate he was not also reassessed on Task 7 during that second session since it seems likely that with time he would have learned the discrimination, especially since he had little difficulty with 8B, where the carpet pieces served as the sample stimuli.

Subject 20 passed Level 4 (as the first task) with one error and Level 6 (as the third task) with none. Task 8B (given seventh) was also passed error free. Task 7 (given fourth), on the other hand, which theoretically should have been easier than both Tasks 6 and 8B, was failed after the subject made seven correct responses, with a maximum of two of them made consecutively. On three occasions during testing of Task 7, this individual pointed to the correct container, yet dropped the object into the wrong one. Task 8A (given as the third task of the second session) was failed after eight correct responses were made, up to three of them occurring in succession. Little more is discovered by a quantitative analysis of this sub-

ject's performance.
CHAPTER IV

DISCUSSION

Hierarchy

Several of the Phase I subjects and two of the Phase II subjects, did not adhere to the previously validated hierarchy. There may be several reasons for this incongruity. Much of the literature did not reveal the sequence of the tasks, but those researchers that did provide this information gave Tasks 1 through 6 in progressive order (Wacker et al., 1983; Wacker et al., in press). This investigation's deviation from the original sequence may play a part in the few irregularities discovered.

The present experiment added new tasks making the test session for its subjects unlike sessions the subjects experienced in previous investigations. These additional tasks may also have affected performance, altering the hierarchy.

Some hierarchy violations with respect to Level 3 are to be expected when the tasks are given out of order. In Task 3, the experimenter first places the foam in the yellow can, indicates the subject should do likewise, then removes the can and box and replaces them on the table randomly with respect to position. For the subject's first trial, the demonstration by the experimenter could function as an $S^D$ for placing the foam in the yellow can even if its position has changed, but on all subsequent trials the subject must
put the foam in the yellow can irrespective of its position with no further SD. In other words, the subject must remember that the yellow can is correct from the one demonstration made when the test begins. When the subject is tested in the original order of the tasks, where Task 3 follows Task 2, mastering the Level 3 discrimination is much less difficult. The first time the subject encounters two choices is in Level 2, Position, and the correct response is always placing the foam into the yellow can. At Level 3, the correct container is again the yellow can, and the only difference from Level 2 is that the can and box randomly alternate positions. If given in order, the subject has not yet experienced anything but the yellow can as the correct container when two containers are present when tested at Level 3. However, when the tasks are given out of sequence, the subject has learned from higher levels that the foam can go into either receptacle. When given Task 3, there is nothing after the first trial to suggest that the yellow can is the only correct container, and with no imitative clue at the start of each trial the client may guess or base his response on an incorrect principle, especially since the containers are changing positions. In retrospect, it is evident that Task 3 should not be given out of order. Therefore, in this investigation, because of the changed sequence, failures at Level 3 do not imply that the hierarchy is not prevailing, but rather that after practice with tasks where either receptacle can be correct, Level 3 is more difficult than when the AVC test is administered in the original order.
In Phase I, those subjects who failed Level 3 but passed higher level tasks, were given Task 3 as the seventh, or higher, task. The Phase II subjects who failed Task 3 were given it as the eighth and fifth tasks; thus, in both phases, Task 3 was often given after some of the new, more difficult tasks. This change in types and order of tasks administered from previous research may be partially accountable for some of the discrepancies in the current findings. When Subject 20 was given Task 3 again at a later session, he passed. It is worthwhile to note again that failure is somewhat arbitrary and may partially depend on the subject's skill capability, mood, physiological condition, or level of attentiveness.

New Tasks

Regarding the new tasks, subjects may have encountered such trouble with Task 8A for three reasons. First, they may have trouble with nonidentity visual matching in general, and those subjects should also have failed Task 7. The second possible reason for difficulty is the conceptual nature of the task involved in making the correct response. The subject must look at an object held by the experimenter and then, based on that sample stimulus, pick up the foam from the table and place it into the container. This is considerably more difficult than placing the $S^D$ object held in his or her own hand into the appropriate container. When the object is in his or her hand, he or she can bring it into physical contact with the containers; the controlling stimuli (the troll doll and the yellow can, for example) can be physically connected. In Task 8A, there is
only an abstract, conceptual connection between the controlling stim-
uli. Although there is a similar lack of physical correction in the
audio-visual discrimination, it seems less relevant to subject per-
formance since it appears to be an easier skill to acquire than the
nonidentity experimenter-held visual discrimination. In retrospect
it is apparent that to determine if this type of conceptual connec-
tion is a factor involved in making Level 8A so much more difficult
than other visual discrimination tasks, a shaping procedure from Task
4 would need to be conducted. If a subject successfully performed
Task 4, the experimenter would then hold the miniature yellow cylin-
der and red cube while the subject placed the foam from the table
into the correct container. Once accomplished, the experimenter
would fade the colors of the cube and cylinder, and then fade the
shape until the task was like Level 3. If a subject passed Level 4,
but failed it when the examiner held the same cube and cylinder and
the subject was required to put the foam from the table into the
container, that would indicate that the conceptual nature of the
discrimination task is where the difficulty lies. If the subject
passed both the original and new Level 4, but failed when the colors
and shapes of the sample stimuli no longer resembled the containers,
that would suggest that the subject encountered difficulty with sym-
bolic (nonidentity) visual conditional discriminations. Another
possibility is that Task 8A is made more difficult because it is
presented without any prior training. Using this gradual shaping
process, subjects who fail 8A initially may be able to more easily
acquire the skill.
Thirdly, subjects, especially those in Phase I, may have had very little experience with nonidentity visual matching like that required in tasks 7, 8A, 8A', and 8B. Arbitrariness occurs a great deal in audio-visual matching; there is rarely anything about an auditory stimulus that is like its visual counterpart. Words are symbolic, and most of these individuals have experienced their nonverbal behavior under the control of verbal stimuli quite a bit. In other words, many of these people have learned to respond correctly when given verbal cues, such as "Go to the dinner table," or "Get the black chair." Generally, until people are reading, there is very little experience with visual arbitrariness. It is unlikely that someone would need to respond to a visual cue that does not look like the task to be performed. Most lower functioning individuals are taught to respond to visual cues that physically resemble what is to be done. For example, an individual may learn to put books on a shelf that has a picture of books on it. It is unlikely that the same individual has been taught to put books on a shelf with a cue that is the letter B. If he had, his behavior would have come under the control of an arbitrary visual stimulus. Usually, unless they are learning to read or write, individuals are not required to make such symbolic (arbitrary) discriminations. This insufficient experience may explain why the Phase I subjects did so poorly on both Tasks 8A and 8B.

Since Phase II subjects could at least write their names, they had somewhat greater experience with symbolic visual stimuli than those in Phase I. This may account for their superior performance on
Task 8B where they were required to look at the carpet sample stimulus as they picked up the foam. In spite of their prior experiences, Task 8A, where the examiner holds the sample stimulus, was still extremely difficult for the Phase II subjects. It may be uncommon to have to respond to a visual stimulus so physically disconnected from the stimuli to be manipulated. The extra step in 8B is perhaps simpler because the $S^D$ (piece of carpet) is in a way attached to the rubber foam to be used. Task 8B is more like Tasks 4 and 7 where the subject can physically connect the controlling stimuli.

The continuousness of the sample stimulus in Task 9 did not make it an easier task than noncontinuous, vocal auditory, 5 and 6. It was erroneous to overlook the fact that Phase I individuals have likely had massive exposure to words, and probably a great deal of language training, to whatever degree of success. This background makes the squeaky noises and rattles of Task 9 very peculiar indeed, since these people have probably rarely had their behavior come under the control of auditory stimuli that were not from a human voice.

The higher language individuals of Phase II may have been more exposed to nonhuman auditory stimuli regulating their behavior. Alarm clocks, whistles at the end of the day, buzzers when food is ready all may be part of their daily environment. It may also be reasonable to assume that because of a greater capacity for learning more quickly than the subjects in Phase I, some of the Phase II subjects were able to master this new discrimination.
Future Research

A larger number of subjects who pass Level 4 but fail Levels 5/6 would enable us to determine the intermediacy of Task 7, since the results from three such subjects in Phase I suggest the possibility. Future investigations could examine Task 7 more accurately by using more subjects who fail Levels 5/6, yet pass Level 4.

Another improvement to the study would be to analyze a fading procedure, like the one previously mentioned. Subjects who pass Task 4 should be tested on a task requiring them to place the foam into the can or box conditional upon whether the small cube or small cylinder is held up by the experimenter. They should also be tested using a black cube and a black cylinder held by the examiner, and then with sample stimuli of increasing dissimilarity to the containers.

A further potentially helpful modification in the research strategy would be to eliminate the pass/fail criterion presently used. It may be more informative to have an upper limit of trials—perhaps 100 trials per task—and then observe how long or how many trials to criterion, before a subject learns the discrimination. This quantitative scoring system might provide a more precise measurement of ability to perform a discrimination task than the pass/fail criterion. This is not to suggest that such an alteration should be made in the assessment tool itself; the test would then take too long to be of practical use. But within a group of subjects who have failed (or passed) one level, there is a great deal of
variation in how that failure took place. For research purposes, to
discontinue working with a subject after eight incorrect responses
eliminates the opportunity to discover more about the acquisition of
the skill. Especially with subjects whose performance is borderline
(many incorrect responses before passing, or many correct responses
before failing), this quantitative approach would lead to an enhanced
understanding of discrimination skills acquisition.

Future research could also examine the use of the AVC scale as
an adaptive behavior measure, which is required in diagnosing mental
retardation. Because the skills performed during the test generalize
to daily living behaviors, this assessment tool may be a useful addi­
tion to the required battery.

There is no question as to the value of the AVC approach to
skill assessment in handicapped individuals. The present research
was an attempt to refine this approach in terms of possible addi­
tional discrimination capabilities, but for a variety of reasons must
be considered only suggestive of the direction that such refinement
might take. Follow-up research of the sort suggested above, however,
might result in the development of an even more useful AVC test.
Appendix A

Data Recording Forms

40
DATA RECORDING FORM
AVC Extension

Name_________________________ Time Start______________
Date_________________________ Finish______________

Instructions: If response is correct, circle trial number. If response is incorrect, place X on trial number. The task is complete when eight (8) consecutive correct trials are made. Discontinue when eight (8) errors have accumulated. Errors that occur as part of a correction trial (see procedures) should be underlined, X. If a subject corrects an error during a correction trial, do not record a correct trial.

Task #1  Demonstration

Present one container at a time. After four (4) consecutive correct responses with the red box, switch to the yellow can. Criterion is met when four (4) consecutive correct responses are made with the yellow can.

Trials:  Red Box
        1  2  3  4  5  6  7  8
        9 10 11 12 13 14 15 16

Yellow Can
        1  2  3  4  5  6  7  8
        9 10 11 12 13 14 15 16

Notes:
Task #2  (Position)

The Can and Box remain stable. The correct stimulus is the Yellow Can.

Trials:  1  2  3  4  5  6  7  8
         9 10 11 12 13 14 15 16
         17 18 19 20 21 22 23 24
         25 26 27 28 29 30 31 32

Notes:

Task #3  (Visual)

Correct stimulus is Yellow Can positioned to the subjects' right (R) or left (L) as indicated below.

Trials: L  R  L  L  R  L  R  R
        1  2  3  4  5  6  7  8
        R  L  L  R  L  R  R  L
        9 10 11 12 13 14 15 16
        L  L  R  L  R  R  L  R
        17 18 19 20 21 22 23 24
        R  R  L  R  L  R  L
        25 26 27 28 29 30 31 32
        L  R  R  L  R  L  L  R
        33 34 35 36 37 38 39 40

Notes:
Task #4  (Match-To-Sample)

Place the yellow can to the subject's right (R) or left (L) as indicated by the top row. Present the Red Cube (B) or the Yellow Cylinder (C) as indicated in the second row.

Trials:  
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</table>

Notes:
**Task #5**  
(Auditory)

Containers remain stable. Correct stimulus is the one asked as indicated below by B for Red Box and C for Yellow Can.

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<thead>
<tr>
<th>Trials</th>
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<th>2</th>
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<td>C</td>
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<td>C</td>
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</tr>
</tbody>
</table>

| 17-24  | C | B | B | C | B | C | C | B |
| 25-32  | B | C | B | B | C | B | C | C |
| 33-40  | B | C | C | B | C | B | B | C |

**Notes:**

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**Task #6 (AVC)**

Correct stimulus is what is asked for as indicated by a B for Red Box or a C for Yellow Can in the second row. Place the yellow can to the subject's right (R) or left (L) as indicated in the top row.

<table>
<thead>
<tr>
<th>Trials</th>
<th>1</th>
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</table>

**Notes:**

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Name________________

Task #7 (Non-Identity, Tactile/Kinesthetic Match-To-Sample)

Yellow can is placed on subject's right (R) or left (L) as indicated by top row. Present Troll Doll (to go in Red Box) when B is indicated in the second row. Present the Car (to go in Yellow Can) when C is shown in the second row.

<table>
<thead>
<tr>
<th>Trials</th>
<th>1</th>
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<th>3</th>
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Notes:
Task #8  (Non-Identity Match-To-Sample with Continuous Visual S0)

Yellow can is placed on subject's right (R) or left (L) as indicated in the top row. The Troll Doll (which indicates the rubber foam should be placed in the Red Box) is held up when B is in the second row. Hold it up until the subject makes a response. The Car (which indicates the foam should be placed in the Yellow Can) is held up when C is in the second row. Hold it up until the subject responds.

<table>
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<tr>
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<th>R</th>
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Notes:
Task #9 (Auditory Discrimination with Continuous SD)

The rubber foam should be placed into the Red Box when the squeaky toy is sounded (B). The foam should be placed into the Yellow Can when the rattle is sounded (C). Continue the sound until a response is made.

Trials:  C  C  B  C  B  B  C  B
1  2  3  4  5  6  7  8
B  C  B  B  C  B  C  C
9 10 11 12 13 14 15 16
B  C  C  B  C  B  B  C
17 18 19 20 21 22 23 24
C  B  C  C  B  C  B  B
25 26 27 28 29 30 31 32
C  B  B  C  B  C  C  B
33 34 35 36 37 38 39 40

Notes:
Appendix B

Protocol Letter From Human Subjects
Institutional Review Board

49
Date: September 18, 1989
To: Valerie R. Davine
From: Mary Anne Bunda, Chair

This letter will serve as confirmation that your research protocol, "Extension of the AVC Discrimination Test", has been approved by the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application. You must seek reapproval for any change in this design.

The Board wishes you success in the pursuit of your research goals.

cc: J. Michael, Psychology
BIBLIOGRAPHY


Yu, D., Martin, G. L., & Williams, L. (in press). Expanded assessment for discrimination learning with the developmentally

51
handicapped: A practical strategy. American Journal of Mental Deficiency.