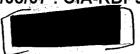Final Report
Covering the Period October 1980 to October 1981

April 1982

AUDIOLINGUISTIC CORRELATIONS WITH THE QUALITY OF REMOTE VIEWING SESSIONS (U)

TAB F

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ILLUSTRATIONS

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I OBJECTIVE

The objective of this program was to determine the feasibility of developing audio analysis techniques that can ▆▆▆▆▆▆▆▆▆▆▆▆▆ separate correct from incorrect statements recorded during remote viewing (RV) experiments.

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II   INTRODUCTION

A.   Statement of Problem

During a typical RV session, the subject produces a wealth of spoken material, but only some of this material relates to the chosen target. Unfortunately it is difficult to identify the target-related material without a priori knowledge of which times the subject was engaged in accurate RV. The question posed in this study was whether it is possible to use audio analysis techniques to determine when a subject is accurately describing the intended target.

B.   Possible Solution

Careful listening to tapes of sessions with a single subject suggests that some target-related material was uttered in a different tone of voice than other material (e.g., conversation with the monitor). For this subject, accurate remote viewing appears associated with certain changes in speech behavior, including speaking more softly, more slowly, longer pauses, and with a dream-like quality.

In general, if a subject were to exhibit a particular set of speech changes whenever target-related material was being produced, the analyst could use these speech changes to separate the related from the unrelated material without knowledge of the target. We explored the relationship between changes in speech behavior and the accuracy of target descriptions in this study.

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C. Historical Perspective of Audio Analysis Techniques

Earlier research has shown that changes in speech behavior can reflect subtle physiological changes such as those resulting from stress or disease. Two studies representing this research will be described to provide a context for the present study of speech changes observed during RV sessions. These studies illustrate different approaches to speech analysis.

The first study was designed to examine how speech behavior may be influenced by task-induced stress.[1] An arithmetic task requiring a verbal response was repeatedly administered to each of ten male subjects. The difficulty of the task was varied from trial to trial: on some occasions the subject was obviously stressed, and on other occasions he was relatively relaxed. Contrasting responses containing the same test phrase were compared by means of critical listening and instrumental analysis.

Listeners were able to discriminate between the responses representing the stress and control conditions for many subjects. Level measurements showed that three subjects spoke more softly and one subject spoke more loudly under stress. Measurements of fundamental frequency provided similar results: some subjects raised their vocal pitch, others lowered their vocal pitch, and still others exhibited unique pitch contours when the task became stressful. An extensive comparison of spectrograms demonstrated many other stress-related changes in the speech signal. Temporal and spectral irregularities were observed in the acoustic pulses that are generated in the larynx during speech production. Stress also affected the precision with which particular speech sounds were articulated.

The second study was concerned with speech changes that are related to cerebrovascular disorders.[2,3] The purpose of the study was to develop a subjective method of speech analysis that could be used to identify persons who have suffered a minor stroke. Because stroke affects speech

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production in a complex manner, all speech samples that were analyzed were first converted into spectrograms. Experiments were conducted to determine whether certain speech attributes observed in the spectrograms could be used to discriminate between a population of diagnosed stroke patients and an age-matched population of normal speakers. Linear discriminant scores based on ratings of only six speech attributes correctly classified 89 percent of the stroke patients and 87 percent of the normal speakers.

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III METHOD OF APPROACH

A. Selection of Data Base

To determine a useful set of audiolinguistic (A/L) criteria, it was important in this pilot investigation to work with a RV data base that met two conditions:

(1) The data base had been independently analyzed by "blind" judging procedures.

(2) The RV targets had to be well-defined.

The first requirement defined the minimum assessment standard; namely, any A/L technique had to perform at least as well as blind judging procedures. The second requirement allowed for an unambiguous element-by-element comparison between target information and RV-generated data. To meet these requirements, an existing data base from earlier SRI experiments was used.

In an early attempt to assess the nature of "abstract" targeting, Subject 504 was the only participant in the "Coordinate Box Experiment." The target material was a collection of 16 small dissimilar objects, placed one each in a 4 x 4 matrix array. Each cell of this matrix was a cube measuring approximately one foot on a side. Subject 504 was targeted with only a row and column address and asked to describe the object at that location. The experiment consisted of six trials. A complete description of this experiment can be found elsewhere.[4]

The overall result derived from blind judging analysis was significant. Two important features of this experiment were (1) the targets were well defined (Figure 1) and (2) the target-transcript correspondences

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4 x 4 ARRAY OF OBJECTS USED IN BOX COORDINATE EXPERIMENT

FIGURE 1 (U) 4 x 4 ARRAY OF OBJECTS USED IN BOX COORDINATE EXPERIMENT

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ranged from excellent to rather poor. These two features allowed for a sensitive test of the A/L procedure described below.

B. Audiolinguistic Protocol

Three out of the six trials from the Coordinate Box Experiment were chosen for study. They represented the best correspondence (doll target), an intermediate level of correspondence (book target), and a poor correspondence (plant target). A verbatim transcript was produced from each trial (a sample transcript, the one for the best-correspondence case, is shown in Appendix A). First, the utterances were sequentially numbered for ease of reference. Then, on a blind basis, each utterance was labeled as belonging to one of four categories, defined on the basis of A/L characteristics as listed below.

The first category, Present Time (PT), is defined as that characterized by a slow, dream-like utterance that is usually preceded by a pause. Sentences tend to be in the present tense, and are typified by "I feel ...," "I see...," or "There is ...."

The second category, debriefing (DB) is defined to be that characterized by initial excitement and a higher vocal effort. There is frequently an announcement of debriefing such as, "I just got a flash ...." Debriefing may be characterized by present or past tense statements, like "I feel ...," "I saw ...," or "There is (was) ...." Although this is similar to PT, the voice quality is considerably different.

The third category, analysis (AN), is defined to be characterized by statements that contain analogies and associations with respect to an object, e.g., "It looks like ...," or "It reminds me of ..." Utterances that contain generalizations with respect to an object (e.g., "It must be some kind of a ...") are also considered to be analysis.

Finally, the fourth category, conversation (CO), consists of questions asked of the experimenter, answers in response to non-task related questions by the experimenter, and general statements directed to the experimenter. The voice quality in this category is matter-of-fact and colloquial.

C. Scoring the Utterances

The utterances were scored in two separate ways: (1) by a target-dependent scoring procedure and (2) by a target-independent method. Both techniques share a common preprocessing, which is described below.

1. Preprocessing the Utterances

The conversation category was first eliminated for all the analysis done in this study. For each of the three remaining A/L categories, PT, DB, and AN, each utterance was reduced to one or more concepts. A concept is technically defined as a short phrase that best represents the idea incorporated in the utterance. The concepts are then edited to remove any redundance with the category. A zero in the duplication column in Appendix B indicates that a particular concept was ignored because it was redundant. The resulting lists of concepts were then analyzed by a target-dependent procedure and by a target-independent method. The following analyses were conducted for each of the three responses chosen for this study.

2. Target-Independent Analysis

In the target-independent analysis, a simple count of the number of nonredundant concepts in each category is computed. It was hypothesized that the percent of PT statements would correlate with the blind judging results and thus could serve as a predictor of RV quality.

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From these summations, the percent PT is calculated from

$$\%PT = No.(PT) / [No.(PT) + No.(DB)] \qquad (1)$$

where No.(PT) and No.(DB) are the number of PT and DB concepts, respectively. It must be noted the %PT can be calculated without any knowledge of the target.

3. Target-Dependent Analysis

Following an idea first proposed by Targ et al.,[5] a detailed target-dependent analysis was devised. With a response conceptualized in accordance with the above guidelines, the target-dependent analysis proceeds in three steps:

(1) Binary determination--Each concept is assigned a one if some element in the target appears to correspond to the concept in question. The concept is assigned a zero otherwise. There is no implied evaluation at this point, but if there is a correspondence, the identified element must be explicitly noted.

(2) Quality evaluation--A quality evaluation is made for each concept that has been assigned a one from Step (1) above. The evaluation is made on a one-to-five-point scale shown in Table 1.

(3) Centrality evaluation--Each concept that has been assigned a one from Step (1) above is also evaluated with respect to the centrality of the corresponding target element. Centrality is expressed as a number between one and five (Table 2). This numeric assignment is made according to the element's importance to the target as a whole and is based on target information only.

The scores from these three steps are then multiplied together to form a composite score (maximum of 25) for each concept in each response. Appendix B is a complete example of this procedure for one of the three responses, i.e., for which the target was a small rag doll (Figure 1).

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Table 1

QUALITY RATING FOR A CONCEPT
THAT HAS BEEN IDENTIFIED AT THE SITE
(Specific Target Sub-element)

```
(1)   Little correspondence, but possible

(2)   Some correct elements

(3)   Mixture of correct and incorrect, but more of the former

(4)   Good correspondence, with unambiguous matchable elements

(5)   Excellent correspondence, perhaps with correct analysis
      of the sub-element.
```

Table 2

VISUAL FUNCTIONAL CENTRALITY RATING SCALE
FOR TARGET SUB-ELEMENT

```
(1)   Present, but a trivial or hardly noticeable feature

(2)   Minor feature, could be overlooked, not central

(3)   Prominant, but not central

(4)   Strong, central, visual feature, can not be missed

(5)   Immediately strikes the eye as central.  Only one
      element gets this rating.
```

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IV STATISTICAL RESULTS

Table 3 shows the results of A/L analysis as it was applied to three of the six targets for the coordinate box experiment. The plant, the book, and the doll were chosen for this initial study because the quality of their corresponding transcripts, as described earlier, was poor, inter-mediate and excellent, respectively. The results of the blind judging for the actual experiment are shown in the last column in Table 3. The Greek letter mu (μ) in Table 3 is calculated from the overall concept scores for each category from

$$\mu = \Sigma \text{ concept scores}/N$$

where N is the total number of concepts for the specific category. The μ, then, represents the average score out of a maximum possible 25 for each cateogry. The %PT was calculated from Eq. (1), and F is the F ratio derived from a one-way analysis of variance. For each target, a one-way analysis of variance was computed under the null hypothesis assumption that the scores for A/L category do not differ from one another.

The %PT and the F-ratio represent the results for the target-independent and target-dependent A/L analysis respectively: a correlation with blind judging exists for both analyses.

Table 3

AUDIOLINGUISTIC ANALYSIS RESULTS

Target	μ_{PT}	μ_{DB}	μ_{AN}	N_{PT}	N_{DB}	N_{AN}	%PT	F	Blind Judging (Relative Units)
Plant	4.88	4.79	2.36	8	28	11	0.22	1.47	1.00
Book	2.50	4.45	1.63	10	20	8	0.33	1.53	2.19
Doll	7.37	8.33	0.00	19	18	7	0.51	4.38	5.09

V CONCLUSIONS

This pilot investigation was conducted on the basis of a detailed analysis of three trials from a single subject. Therefore, it is premature to conclude with certainty to what degree the particular A/L analysis technique used with this subject can be generalized. It is possible, however, to conclude that the A/L technique is basically productive in its approach. In particular the observed correlation of the target-independent analysis with previous blind judging results is highly encouraging.

As the A/L analysis technique evolves further, a single set of A/L criteria is not expected to be applicable across subjects; rather, for the operational setting, in all likelihood a subject-specific set of criteria must be developed.

In summary, it should be emphasized that, (1) at a minimum, some improvement in the RV product can be immediately realized by rejecting all analytical (AN) statements; (2) beyond that, a full audio-linguistic (A/L) analysis of utterances appears to further differentiate correct from incorrect statements generated in RV sessions.

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Appendix A

VERBATIM TRANSCRIPT FOR COORDINATE D-3 (DOLL)

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Appendix A

VERBATIM TRANSCRIPT FOR COORDINATE D-3 (DOLL)

Utterance Number		Utterance
1	A	Well, I saw right away the butterfly again
	M	Butterfly?
2	C	In one of the experiments I drew what I thought was a bow-tie, what's what is looked like; butterfly
	M	Uh-huh
3	D	It feels like material, velvety something; it's, it's a plushy feeling of silk
	M	Uh-huh
4	A	If you ask me, it's of an artificial flower--
	M	Uh-huh
5	A	Dark ... colored
	M	Uh-huh
6	D	Dark brown or dark [mole] or ... some dark color
	M	O.K.
7	A	It feels like something layered
	M	Layered?
8	C	Yea
	M	Uh-huh
9	A	Regularly layered--
10	C	[are you] sure that's D-3?
	M	D-3. Right. Coordinates are D-3
11	D	Something with a slightly cerrated edge--
	M	Uh-huh. Are the cerrations associated with this, er, velvety ... material?
12	C	Yea ... yea

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Utterance Number	Utterance
M	Uh-huh
√13	[The bat]
√14	Bat, butterfly, artificial blossom--
√15	It's a [beast] (laughter)
M	Ha, ha, ha
16	It's almost as if it's a dome-shaped ... feeling, it's a rounded ... feeling--
M	Uh-huh
17	Something that would fit into the palm of my hand
M	Uh-huh
√18	[Like] a mushroom--
M	If you look right down on top of it, into the box, what do you see?
19	Yea, that, that's where I see this dome-shaped thing, that would be, you know, this--(drawing) like an open umbrella from the top
M	Uh-huh
20	But I feel material sort of strongly, ah--velvety ... [it's a feely] sort of soft--
√21	Maybe not upholstered, but spongy ... texture, soft--
M	Uh-huh
√22	Resilient
√23	It's like, like, like this blossom, or a, ah--this object has a, you know, like the stem of an umbrella or something like that, and it's standing in a ... sort of has its foot or feet in a ... in something light--it's like having, ah, mid-calf booots on, the type--
M	Uh-huh
24	Well, like a, like a high cup they are standing in--
M	Uh-huh

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Utterance Number		Utterance
$\wp\!\!\!/$ 25 $\wp\!\!\!\backslash$		That cup seems to have striations around it, and it's light colored, very very different colored from the ... from the overall darkness, and velvety soft and matt, mattness of the object--
M		Uh-huh
$\wp\!\!\!/$ 26 $\mathcal{D}$		It's a small and shiny and beady and ... er, could be, you know, highly polyurethane wood or ... some kind of highly polished ... container or bead--
M		There are really two aspects; one is the--
√27 $\diamond$		Yea, that, that's sort of the lower appendage of this ... dome-shaped material ... object
M		Uh-huh. Does this lower appendage have a coloration to it?
$\mathcal{D}$ 28 $\wp\!\!\!\backslash$		Yea, it's, it's sort of very light wood color and very shiny, very polished
M		Uh-huh
$\mathcal{D}$ 29 $\wp\!\!\!\backslash$		And it has horizontal black lines sort of ornamenting it
30 C		Ah--[I] can't get it together, though--
M		[If] you look up from the bottom of the box, what do you see?
$\mathcal{D}$ 31 A		Well, like the spokes of an umbrella from underneath--
√32 A		It's, it's very much like that thing that I got ... yesterday ... [ ] it's very funny--
M		[If] you need more paper, I've got plenty--
33 C		[No,] I have, I have--
$\mathcal{D}$ 34 A		Ah--it definately looks like looking up into ... the spokes of an umbrella
35 C		(drawing) and I remember drawing this yesterday
M		So this is the bottom view ...
36 υ		That, that's the bottom view (drawing)
37 υ		Or rather ... from the bottom ... view
M		Uh-huh. Right

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Utterance Number		Utterance
38	P	And, and this, this ... stem thing could be the handle of the umbrella, you know, which ...
39	C	I mean, I know that those boxes aren't big enough to accommodate a whole umbrella, O.K.?
	M	Uh-huh
40	C	But, but ... it just seems like ... this kind of a thing, you know--
	M	Uh-huh
41	PT	And it has ... striations like this ... this is all light-colored (drawing)
	M	Uh-huh
42	PT	(drawing) like polished ... wood--
	M	Uh-huh
43	PT	And dark stripes (drawing)
44	P	This umbrella isn't simple, I mean, it is essentially that kind of structure from underneath, but from the top it's many-layered--
45	C	You've seen those artificial, eh, silk flowers?
	M	Yes, right
✓46	P	That's the closest thing that it would remind me of
	M	Uh-huh
47	PT	Dark ... satin, something
	M	Uh-huh
✓48	DB	I get purple, I get deep, deep ... purple--almost black
49	D	Kind of an off-color; very, very difficult to describe--
	M	Uh-huh
✓50	D	Between black and brown and purple, O.K.?
	M	Uh-huh. How about a side view of it?
51	C	I was just thinking of the side view of it, it, you know, [from] the side view it's this kind of thing (drawing)

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Utterance Number		Utterance
52	A	You know, like ... side of a flower with a ...
	M	So is that sort of the dome-type structure you're--
53	A	Yea, ah--it's, it's like a flower ... ah--
	M	Uh-huh
54	D	Don't you know, these being the spokes of the umbrella, or the, or the veins of the flower, or some, something that goes like this (drawing)
	M	Uh-huh
55	D	Little [knob] here--
56	D	It's like the foot, you know--
	M	What's like a foot?
57	A	Ah, this is the foot of the object
	M	Oh, I see, right
58	A	Ah--It's definately an umbrella-shaped or mushroom-shaped ... ah--
59	D	Six-sided or more than that, eight-sided, possibly ... object with the ribs--
	M	Uh-huh
60	A	That go up
61	A	And I would say, it it's a very light object ... in weight, and ah--that it's, you know, it fills up in height two-thirds of the box
	M	Uh-huh
62	DB	But it's very light weight--
	M	If you handled it, would it be, ah, rigid or floppy?
63	DB	Well, it has both parts; it has a central rigid core ... ah--but the petals are ... winged or ... ah--covering ... with this satiny stuff is soft, pliable, and ... and floppy
	M	Uh-huh
64	A	Although it seems to be stretched

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Utterance Number	Utterance
M	Uh-huh
65	It, it's material that stretched--
66	From the side, it looks like a black morning-glory on the side, what?
M	Ah--uh-huh, O.K.
67	A [ ] lily, but a ... a color lily with, with ribs not, not bounded, ah--
68	It does have sort of a structure in here (drawing)
M	She's drawing at the base of the ... dome-shaped object
69	I mean, it's ... it's a three-dimensional fan, if you know what I mean
M	Uh-huh
70	[ ] what a three-dimensional fan would look like (laughter)
71	It would have fan characteristics without being flat
M	Uh-huh. O.K.
72	Again, as sort of a last flash, I get a ... white, reflective long triangle, which I can't fit in anywhere, but the reflection just sort of glastened at me ... into ... this shape
M	Uh-huh
73	And that is highly reflective ... ah--that was a reflection I just suddenly saw
M	Uh-huh
74	Like something being turned, picking up light--
M	Uh-huh
75	And in that shape
76	It feels like a very highly polished surface that caught the light--
M	She just drew the acute triangular shape. Here is additional paper, if you need to draw anything else

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Utterance Number		Utterance
77	C	Yea, I'm, I'm trying to see if I see any other images ... ah-- you can put the paper in there too, if you want--
	M	O.K.
✓78	D	Somehow there are some features that has this ... maybe the outside of the umbrella is maybe a smaller version of this ... (drawing)
	M	Uh-huh
79	M	But it has that characteristic on [maybe] the individual ...
	M	Is this the cerrated aspect you ...
✓80		Yea, that's the cerrated aspect of it--
	M	Uh-huh
81		Ah--It's like it has ... I don't know if it's beads at the end or ... something like that ... funny
	M	She's just drawn the cerration with beads at the end
82		It's kind of like knots of material or ...
83		It just a lot of layers on top of each other; this is not a simple umbrella, it's like a ... fancy parasol of a ... of a victorian lady, you know?
	M	Uh-huh
84		Ah--that, that feeling
	M	Uh-huh
85		It also looks like a ... like artificial flower from the top
	M	Uh-huh
86		Petals
	M	O.K.
87	C	I think that's about all I'm seeing ... ah--can't get away from that image
	M	Alright. Shall I call Russ and see?
88		Yea, do

(end of tape)

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Appendix B

SCORE SHEETS FOR THE "DOLL" TRIAL
IN THE "COORDINATE BOX EXPERIMENT"

Appendix B

SCORE SHEETS FOR THE "DOLL" TRIAL
IN THE "COORDINATE BOX EXPERIMENT"

Table B-1

AUDIOLINGUISTIC CATEGORY: PRESENT TIME (PT)
(Experiment #5, Coordinate D-3, Doll)

Utterance	Concept	Duplication	Presence	Element	Quality	Centrality	Total Score
5	Dark colored		1	Feet	4	3	12
6	Dark colored	0					
16	Round dome shape		1	Top of head	4	3	9
17	Fits in palm		0	--	--	--	0
20	Soft material		1	Dress	4	4	16
24	High cup		1	Boot	3	2	6
25	Light colored background		1	White behind red stripes	4	1	4
	Striated		1	Red stripes	5	2	10
26	Small high cup		1	Boots	4	2	8
	Shiny high cup		0	--	--	--	0
	Beady high cup		0	--	--	--	0
55	Little knob		1	Foot	2	3	6
56	Like a foot		1	Foot	5	3	15
59	Multisided		1	Aspect of dress	2	1	2
60	With ribs that go up		1	Aspect of dress	2	1	2
61	Lightweight		1	Object	5	4	20
	2/3 height		1	Object	3	5	15
62	Very lightweight	0					
63	Rigid core		1	Core of doll	3	3	9
	Soft, pliable covering	0					
64	Stretched material	0					
65	Stretched material	0					
68	Ribbed structure	0					
81	Beads at end		0	--	--	--	0
82	Knots of material at end		1	hair	2	3	6

$\Sigma = 140$

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Table B-2

AUDIOLINGUISTIC CATEGORY: DEBRIEFING (DB)
(Experiment #5, Coordinate D-3, Doll)

Utterance	Concept	Duplication	Presence	Element	Quality	Centrality	Total Score
3	Soft material		1	Dress	4	4	16
7	Something layered		1	Dress	4	4	16
9	Regularly layered	0					
11	Slightly serrated edges		1	Apron and dress	2	4	8
12	Utterance 3 and 11 are related		1	Apron and dress	3	4	12
19	Domed shape thing		1	Top of head	3	3	9
21	Soft-spongy		1	Object	4	5	20
22	Resilient	0					
23	Stem with foot		1	Leg and foot	5	3	15
	Foot in high boots (cups)		1	Foot in boots	5	3	15
27	Cup is lower part of soft material		1	Boot	3	2	6
28	Light (wood) color		0	--	--	--	0
	Shiny, very polished		0	--	--	--	0
29	Horizontal black ornamental lines		0				0
31	Spokes of an umbrella		1	Aspect of dress	2	1	2
34	Spokes of an umbrella	0					
38	Stem thing	0					
40	Stem thing	0					
41	Striations		1	Stripes on leg	5	2	10
	Light colored	0					
42	Polished wood	0					
43	Dark stripes	0					
44	Many layered	0					
47	Dark satin		1	Foot	1	3	3
48	Dark purple	0					
50	Dark colored	0					
52	Soft material (top)		1	Dress	4	4	16
	Feet on bottom	0					

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Table B-2 (concluded)

Utterance	Concept	Duplication	Presence	Element	Quality	Centrality	Total Score
54	Spoke type image	0					
58	Mushroom (dome) shape	0					
71	Three-dimensional fan like		1	Aspect of dress	2	1	2
72	Reflective long triangle		0	--	--	--	0
73	Reflective long triangle	0					
74	Reflective long triangle	0					
75	Reflective long triangle	0					
76	Reflective long triangle	0					
78	Serrated edges	0					
79	Serrated edges	0					
80	Serrated edges	0					
83	Multilayered	0					
84	Multilayered	0					
85	Multilayered	0					

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Table B-3

AUDIOLINGUISTIC CATEGORY: ANALYSIS (AN)

(Experiment #5, Coordinate D-3, Doll)

Utterance	Concept	Duplication	Presence	Element	Quality	Centrality	Total Score
1	Butterfly		0	--	--	--	0
4	Artificial flower		0	--	--	--	0
13	Bat (animal)		0	--	--	--	0
14	Bat	0					
	Butterfly	0					
	Artificial blossom	0					
15	Beast		0	--	--	--	0
18	Mushroom		0	--	--	--	0
32	Plant		0	--	--	--	0
46	Artificial flower	0					
53	Artificial flower	0					
66	Artificial flower	0					
67	Artificial flower	0					
69	Artificial flower		0	--	--	--	0
86	Petals of artificial flower	0					

↑ DO NOT APPEAR IN TGT

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