The Team

- Melanie Fried-Oken (PI; speech-language pathologist)
- Charity Rowland (PI; psychologist)
- Jeon Small (RA; medical sociologist)
- Glory Baker (RA; public health student)
- Darlene Schultz (RA; special education student)
- Carolyn Mills (RA; artist)
- Bret Fuller (Statistician)
- David Wilkins (linguist)
- Barry Oken (neurologist)

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Do AAC tools improve the quantity or quality of conversation by individuals with moderate Alzheimer's disease?

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Augmentative and Alternative Communication refers to any strategy, technique or tool that enhances, replaces, augments or supplements an individual's communication capabilities.

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- Speech
- Vocalization
- Gestures
- Eye gaze
- Body language
- Sign language

- Paper and pencil
- Communication books
- Communication boards and cards
- Talking toys
- Speaking computers
- Talking typewriters
- Voice output communication aids

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- Pairing the external aid with familiar and spared skills (such as page turning, reading aloud) should maximize a person's opportunity for success.

- These skills are based on intact procedural memory.

- The stimuli are relevant to a person's ADLs.

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- Speech generating devices
  - Synthesized speech output
  - Digitized speech output
- Computers (Handheld, wearable, or desktop)
  - Dedicated versus integrated devices
  - Software purposes:
    - Schedules
    - Reminders
    - Augmented input or output

AbleLink Web Trak

AbleLink Handheld Visual Compass

ERI Picture Planner

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A hypermedia reminisence program designed and marketed in Scotland, then the UK

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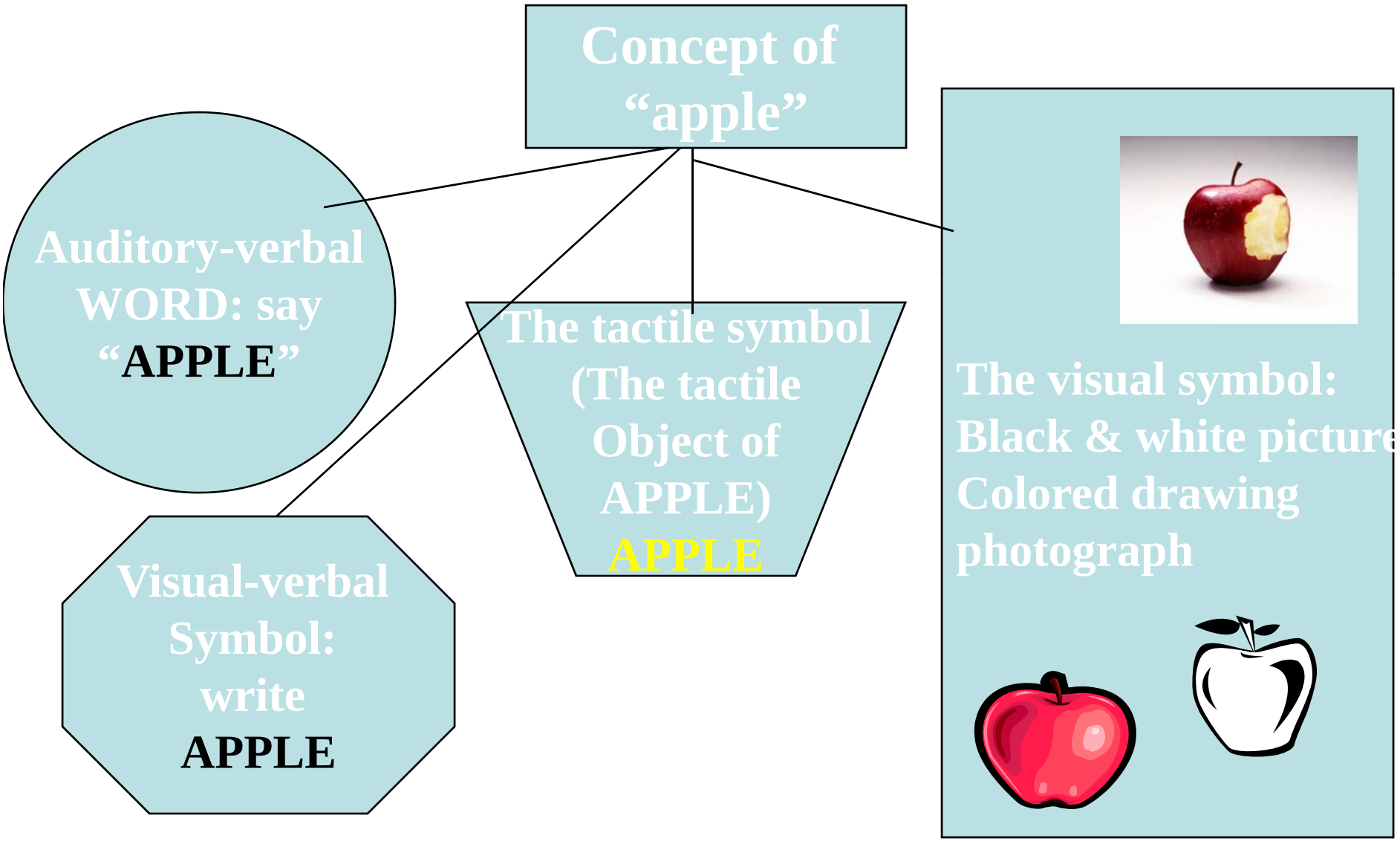
3 things to consider for each aid:

1. The messages or language in the aid;
2. How those messages are presented;
3. The output, or result, of selecting a message from the aid.

What messages should be chosen?

- Autobiographical memories might be accessible.
- Messages that affect the environment might be more meaningful.
- Message topics have been documented within the language of elders.

Levels of representation



What will be the result of symbol selection?

- Communication partner validates message.
- Electronic voice output that labels the symbol.

REKNEW-AD

- Reclaiming
- Expressive
- Knowledge
- In Elders
- With
- Alzheimer's disease

Specific Aims

- 1. To compare the effects of different input modes in an AAC device on conversational skills of persons with moderate AD.
  - Print alone
  - Print + photographs
  - Print + 3-dimensional miniature objects
  - Photographs alone
  - 3-dimensional miniature objects alone
  - Control condition (no board).

- 2. To compare the effects of output mode in an AAC device on the conversational skills of persons with moderate AD.
  - Digitized speech output
  - No speech output

Questions you should be asking by now:

- What do these AAC devices look like?
- What do they sound like?
- What are the different input modes (symbols?)
- How does a participant use the device?

Lena’s cooking board (2-D only)

Lena’s cooking board (3-D only)

“Well, I could use this board to talk from breakfast to hell and back!”

Design for Current Study: # participants per condition (60 total)

		Input Mode		
Output	**FLCI** (language screening score)	**Print only**	**2-D +Print symbols**	**3-D + Print symbols**
Voice output	**Hi**	5	5	5
	Lo	5	5	5
No Voice Output	**Hi**	5	5	5
	Lo	5	5	5
Total		20	20	20

- Conditions are varied between subjects.
- Each subject participates in 4 conversations without board and 4 with board with randomly assigned symbol type.
- 1 control and 1 experimental conversation conducted at each visit.

Subject criteria (from OADC)

- Diagnosis of probable or possible AD by a board certified neurologist (**NINCDS-ADRDA criteria)**;
- Clinical Dementia Rating (CDR) = 1 or 2;
- Mini Mental Status Examination (MMSE) = 8-18 within 6 months of enrollment in study (or we administer);
- Visual acuity better than 20/50 O.U. (as performed in the OADC);
- Hearing screening procedure performed to rule out adults with greater then 40dB hearing loss at screening frequencies (as performed in the OADC); ;
- English as primary language.

Exclusion criteria

History of other neurologic or psychiatric illness (no CVA, reported alcohol abuse, traumatic brain damage, reported recent significant psychological or speech/language disorder).

33 Completed Subjects thus far in Current Study

Gender:	25 Females 8 Males	
Age	Mean = 77 yr.	Range = 50-94
MMSE (0-30)	Mean = 12	Range = 8-18
CDR (0-2)	Mean = 1.6	Range = 1-2
FLCI (0-88)	Mean = 62	Range = 27-85

Method

1. Identify participant and randomly assign to condition;
2. Determine participant's preferred topic and vocabulary;
3. Develop communication device for condition;
4. Conduct 4 videotaped conversations with participant for experimental and control conditions in their homes.

Coding

- A social communication framework relies on the notion of grounding, or the joint establishment of meaning (Clark, 1999).
- A communicative act occurs when partners establish what information is to be entered into common ground.

Non-utterances

- Vacuous Language: nonsensical, rambling utterances
- Unintelligible
- Perseveration: involuntary return to a phrase that occurs at least 3 times in conversation
- No Response: participant does not respond to partner’s bid.

Utterances

- Main Track: Relay propositional content.
- *“Let me tell you what I just ate for lunch.”*

- Collateral Track: Comment on the propositional grounding that may or may not be occurring in the conversation. *“I know that I ate lunch but I’m having trouble thinking of the words. This is hard for me.”*

Explanatory

- Explanatory collaterals advance the conversation by managing it for both the speaker and the listener.
- *"Just a minute while I picture the menu."*

Flag Collaterals

- Flag collaterals serve as flags or signals that the speaker is having difficulty with the conversation, but. don't reveal any insight into *what's* wrong.
- *"Gee, um, uh, I hope this is okay."*

Mode

- Speech
- Minimal Speech (1-word utterance)
- Gesture
- Reference to Board

Completeness

- Completed
- Abandoned
- Interrupted

Topic Management Strategy (for Completed utterances)

The Topic Management Strategy is dependent upo

- Initiate
- Maintain
- Elaborate
- Revive

Content (for Completed utterances)

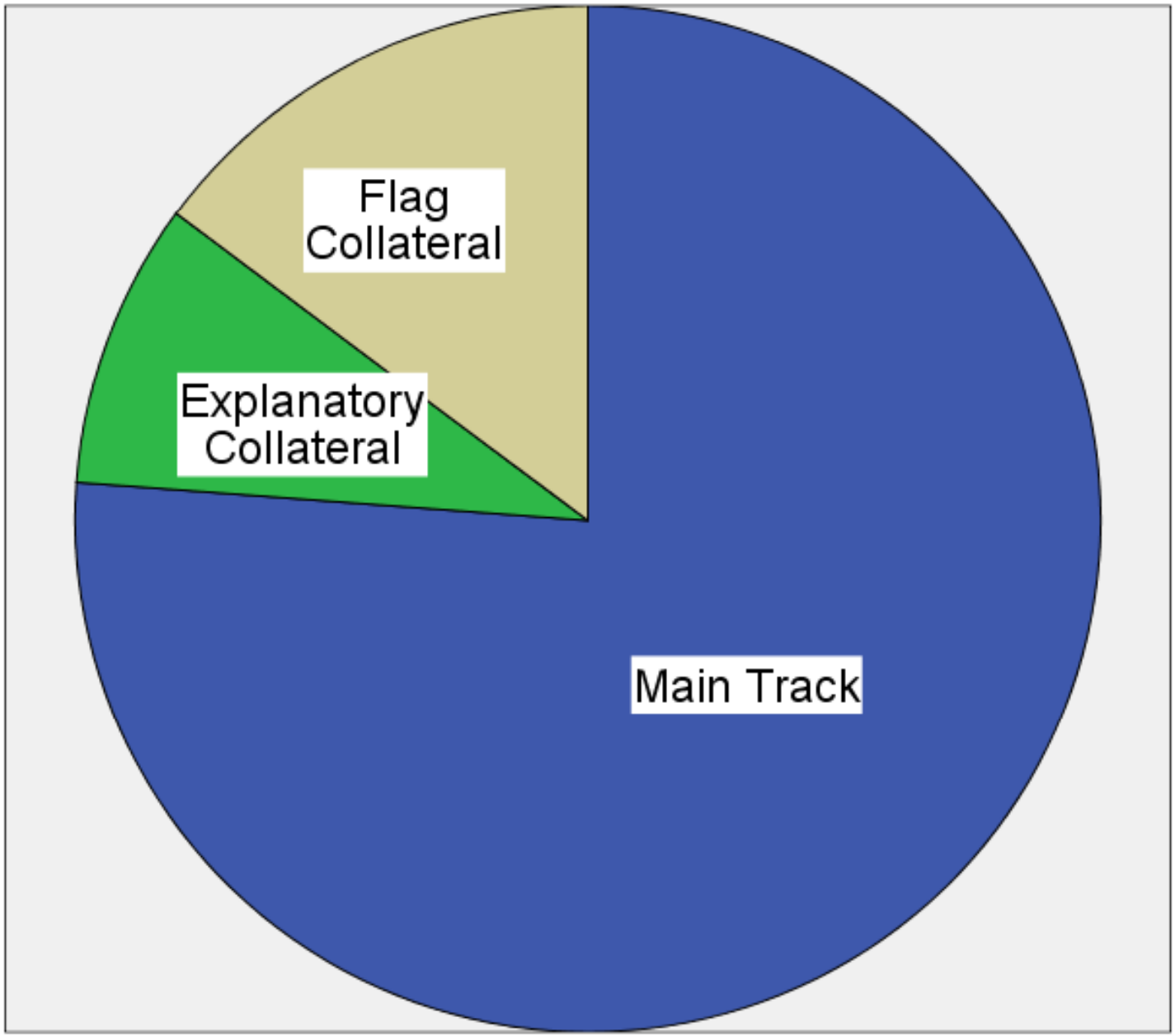
- Board Topic
- Other Topic

Reliability

Mean Index of Concordance across participants:

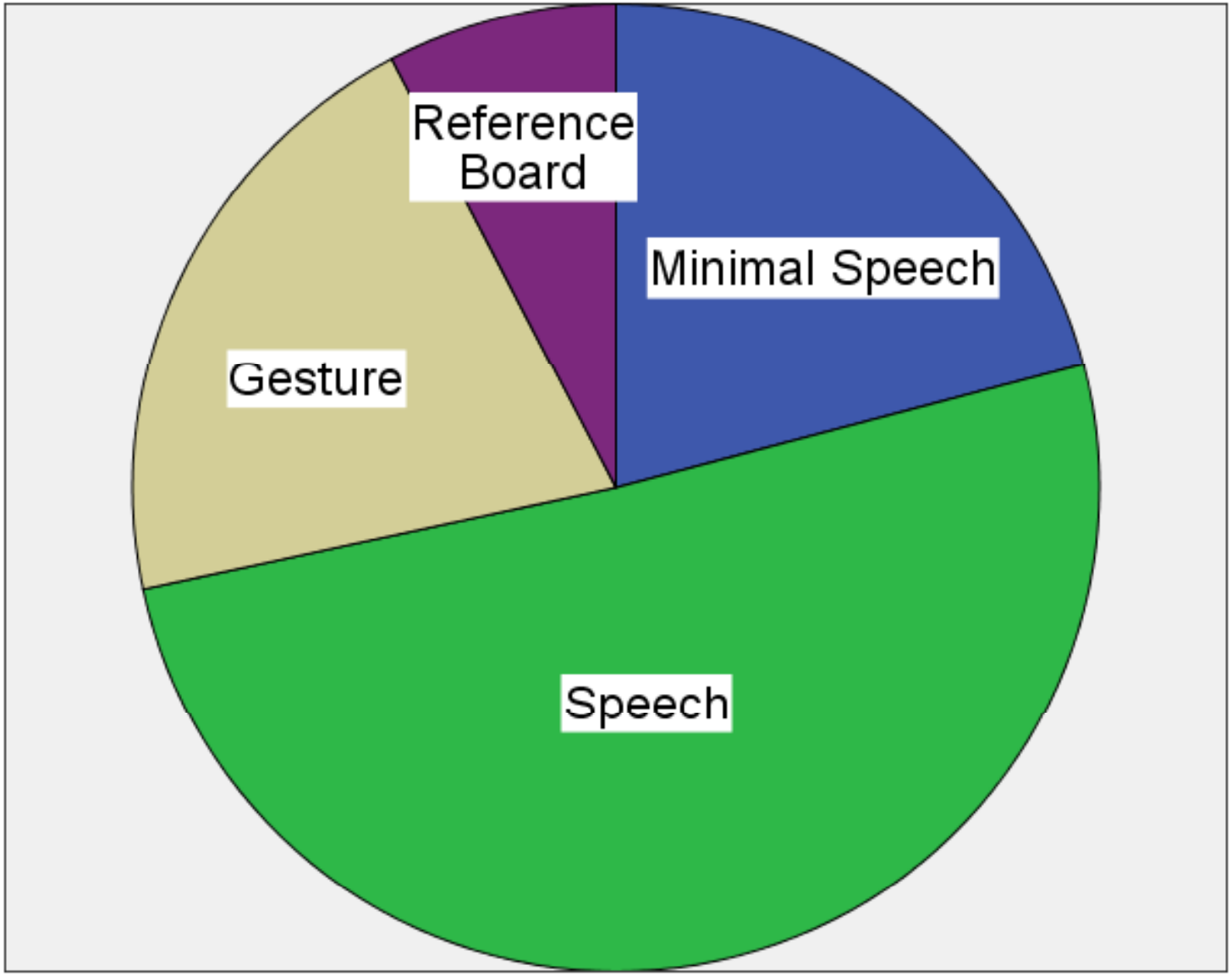
- Signal Track--.82
- Mode--.82
- Completeness--.87
- Topic Management Strategy--.82
- Content--.86
- Overall--.84

Signal Track



Anticipated Effects of AAC on Signal Track

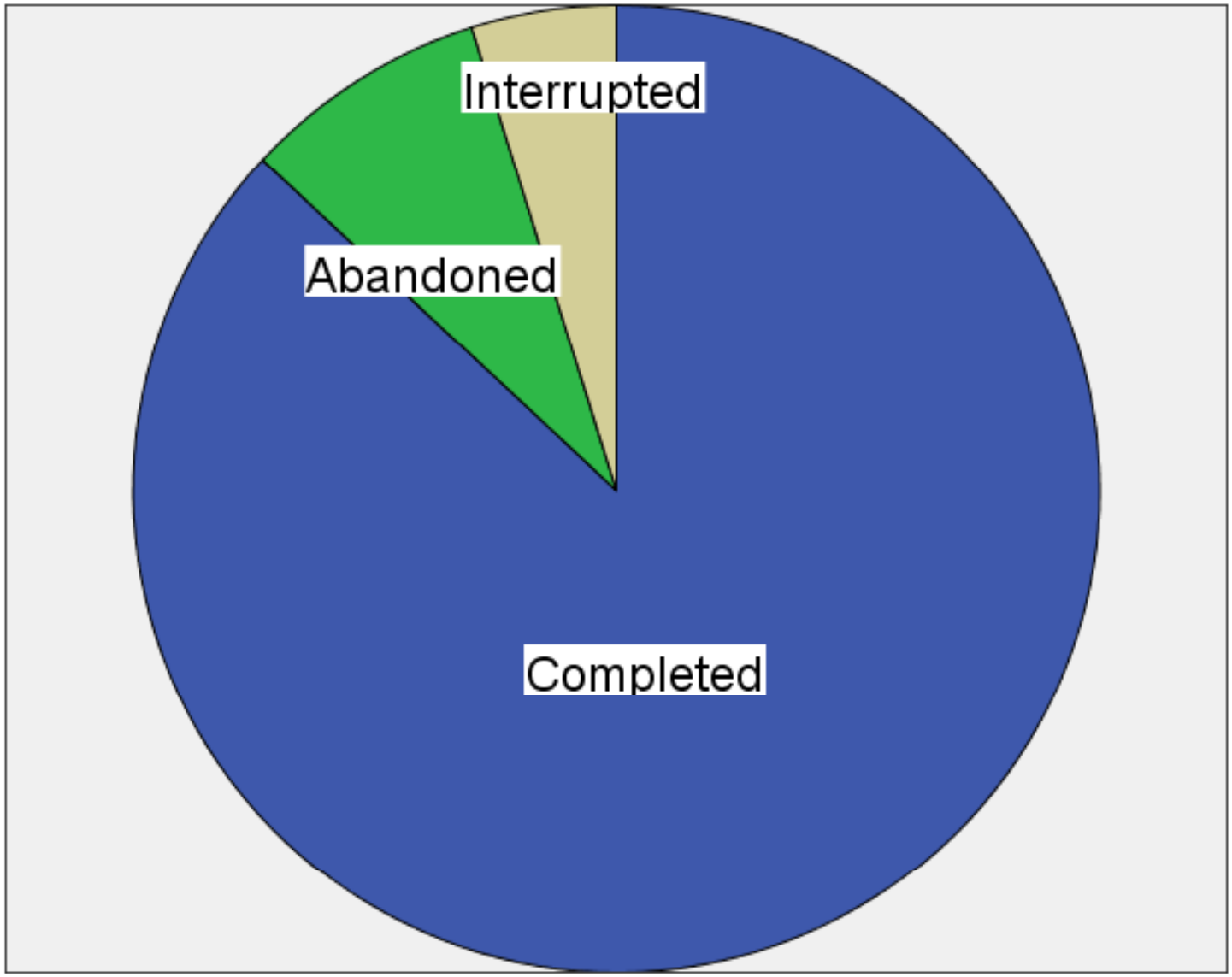
- We expect the rate of Flag Collateral to decrease in experimental conditions
- We expect the rate of Explanatory Collateral to increase in experimental conditions.


Reference Board
Minimal Speech
Gesture
Speech

Anticipated Effects of AAC on Mode

- We expect the rate of Minimal Speech to decrease in experimental conditions.
- We expect the rate of longer utterances (Speech) to increase in experimental conditions.
- We expect to see References to Board in experimental conditions

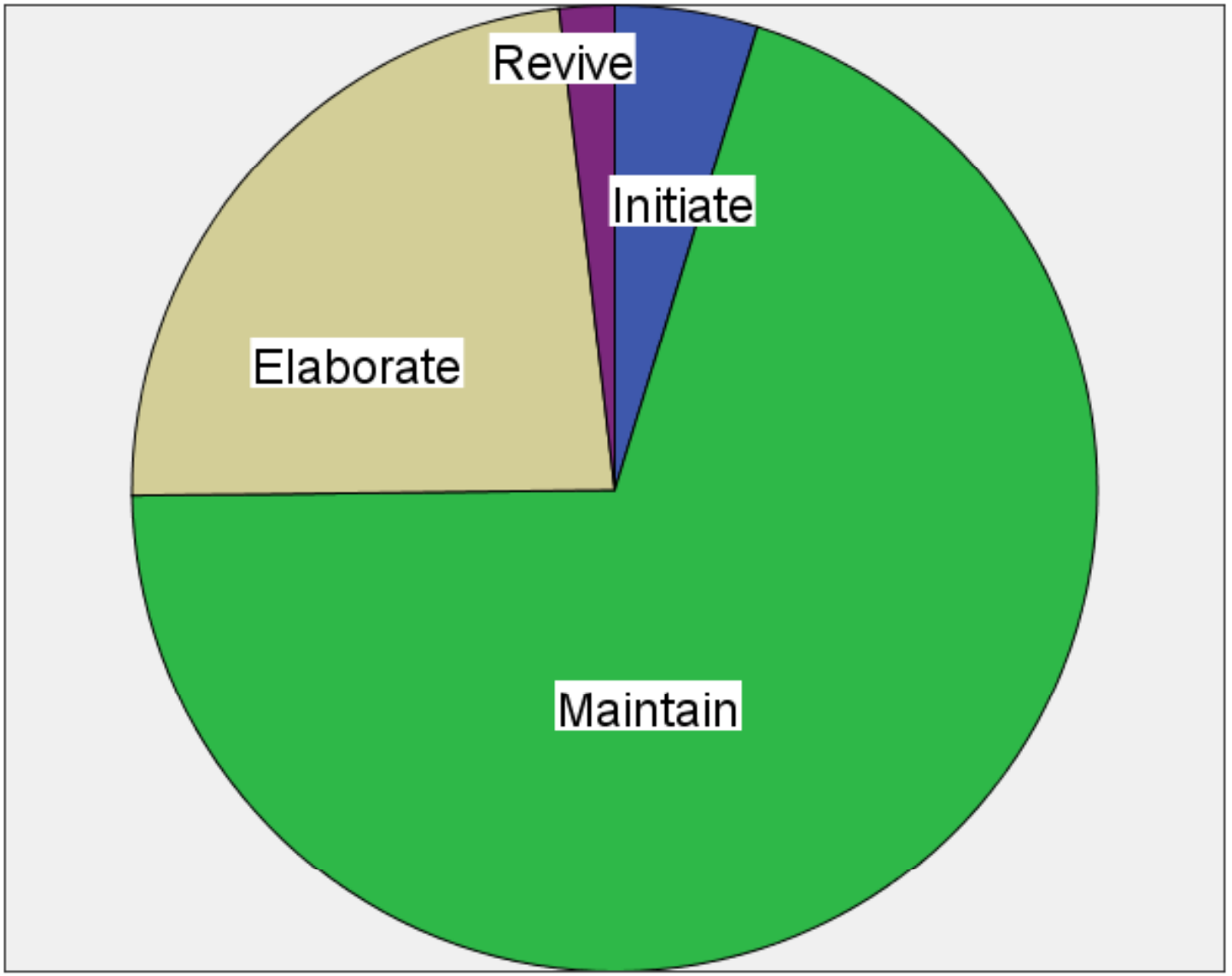
Completeness



Anticipated Effects of AAC on Completeness

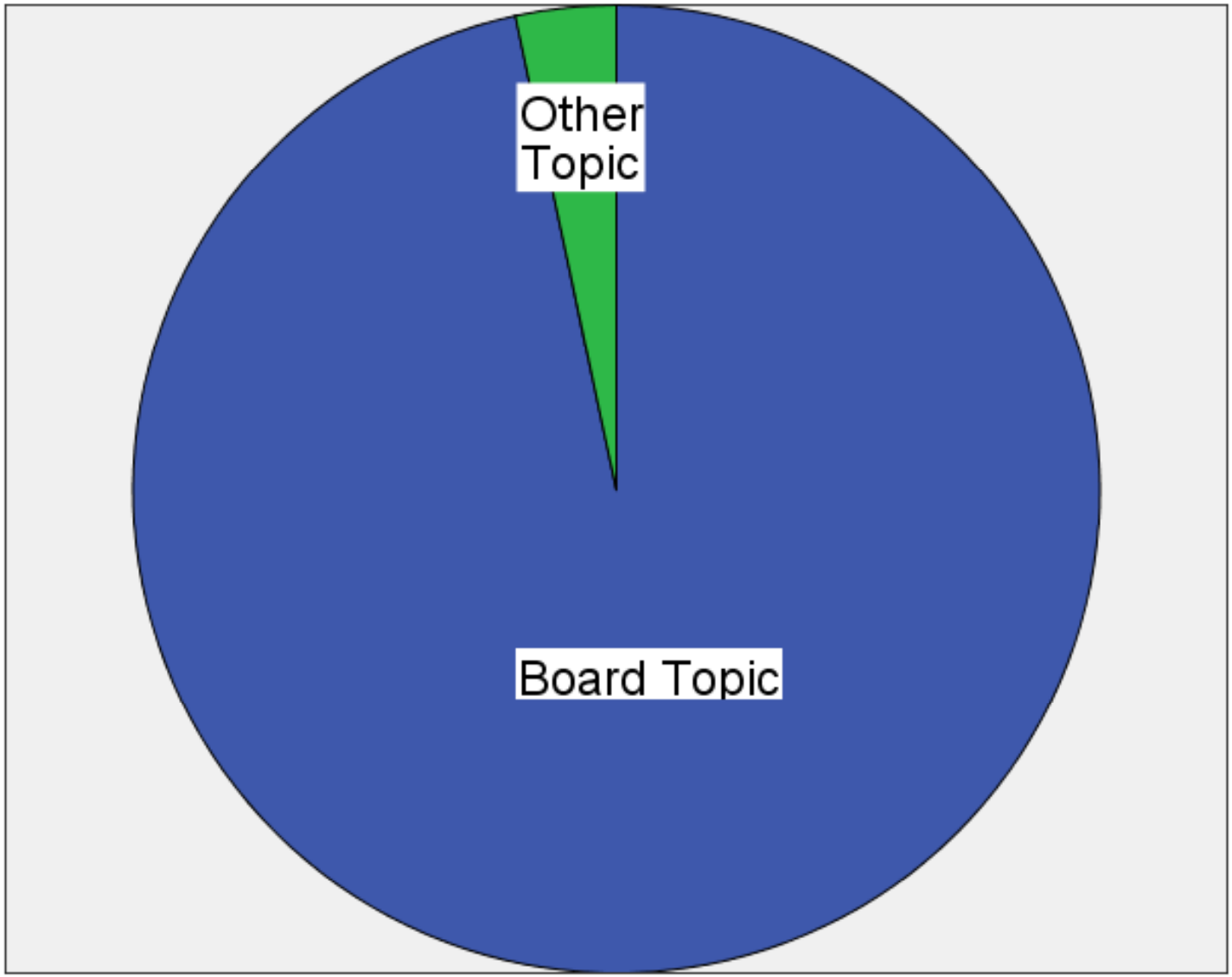
- We expect the rate of abandoned utterances to decrease in experimental conditions.

Topic Management Strategy



Anticipated Effects of AAC on Topic Management Strategies

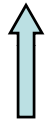
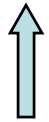
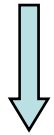
- We expect the rate of Elaborations and Initiations to increase in experimental conditions.
- We expect the rate of Maintenance to decrease in experimental conditions.


Other
Topic
Board Topic

Anticipated Effects of AAC on Conte

- No changes are expected for Content.

Anticipated direction of changes for key dependent variables

Variable	Examples	Direction
# Utterances	(frequency)	
% Flag Collateral	*"um, um"*	
% Explanatory Collateral	*"I know what it is but can't think of the word."*	
% Reference to Board	Point to symbols	
% Minimal Speech	*"Yeah"*	

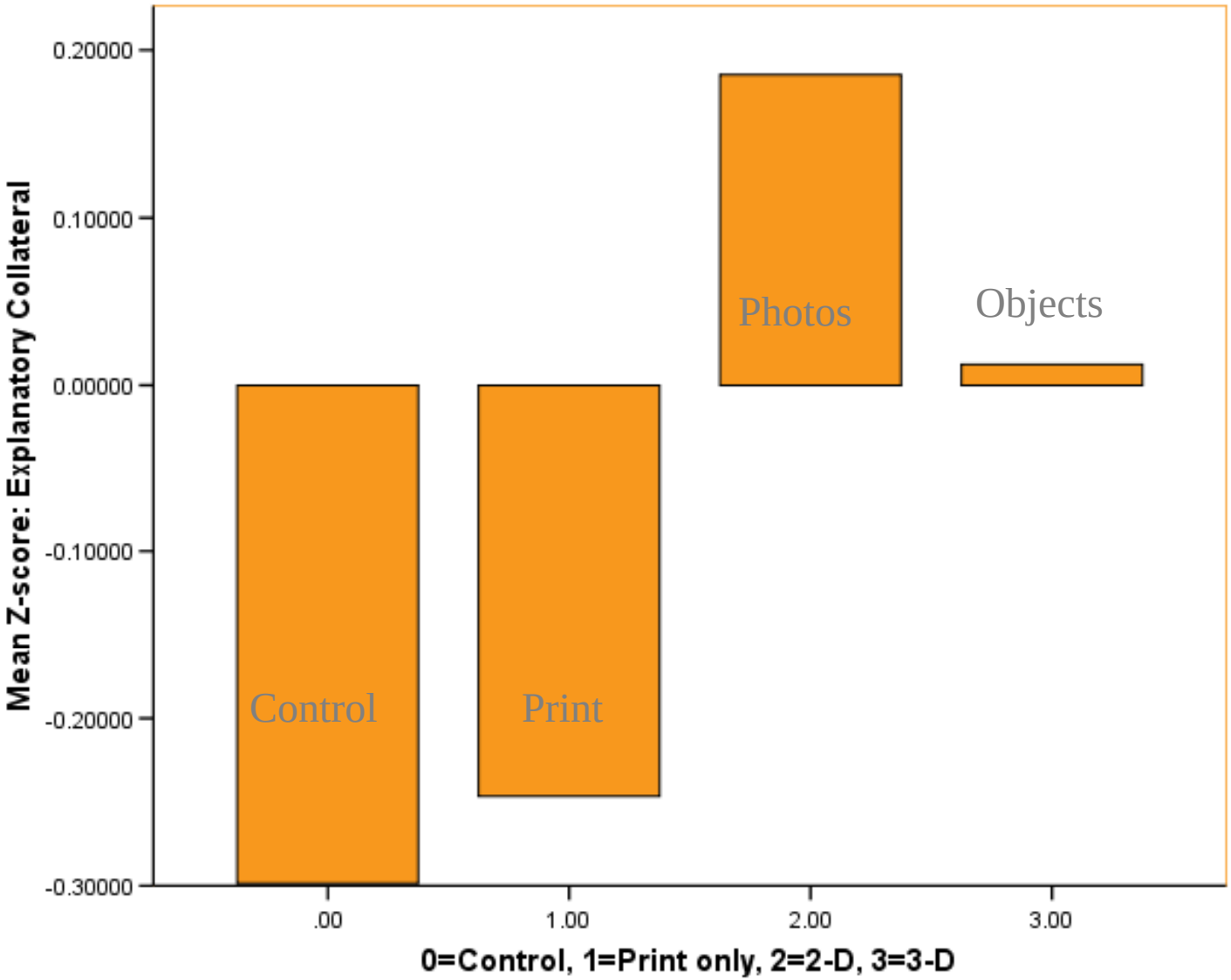
Wide variations between subject means for dependent variables

Variable	Minimum	Maximum
# Utterances	31	79
% Flag Collateral	2%	34%
% Explanatory Collateral	1%	20%
% Reference to Board (Exp.)	0%	27%
% Minimal Speech Only	3%	61%

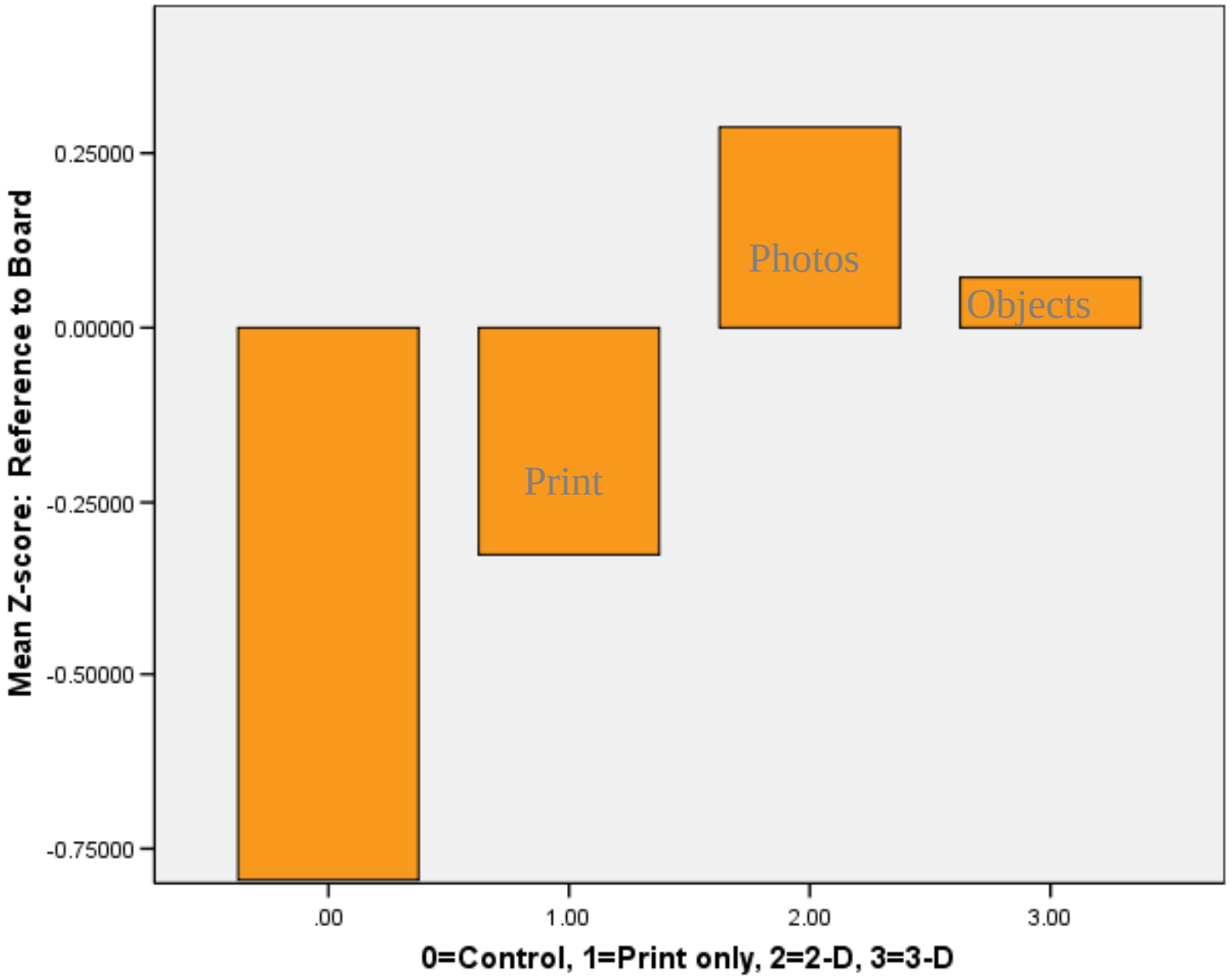
Voice Output

- Fewer utterances with Voice Output ($p<.007$)
- More Minimal Speech with Voice Output ($p<.018$)
- Anecdotal evidence suggests participants are distracted by Voice Output

Explanatory Collateral by Condition



Reference to Board



Flag Collateral by Condition