An Evaluation Of The Acquisition Of Receptive Labels Using Traditional Materials Versus The iPad

Christine Eadon, St. Cloud State University &
Semiahmoo Behaviour Analysis Inc.

Kim Schulze, St. Cloud State University

Introduction

(Kogohara et al.,2012; O'Malley, Lewis, Donehower, & Stone, 2014; Shah, 2011).

Research

- Several studies have reported the iPad as a successful intervention tool

- Studies focused on increasing on task behaviour, decreasing challenging behaviour, or teaching a variety of academic skills.

Increase on task behaviour
Flower (2014); Larabee et al. (2014); O'Mally et al. (2014)

- Evaluated task engagement using iPad or traditional materials for the following academic subjects
  - Math
  - Word decoding
  - Reading
  - Writing

- Increase in on task engagement
  - active or passive engagement with the iPad

Decrease disruptive or problematic behavior
(Lee et al., 2013; Neely et al., 2013)

- Evaluated rates of challenging behaviour
- iPad vs. Traditional materials with therapist based instructions
- Whole interval recording
  - On task behaviour
  - Challenging behaviour

Lee et al. (2013); Neely et al. (2013)

- Decrease in challenging and problem behaviour during the iPad condition
  - Higher rates for challenging and problem behaviour during the traditional condition

- iPad preferred condition

Research

- Teach academic skills
  - Math (purchasing items) (Burton et al., 2013)
  - Sentence frame recognition (Lorah et al., 2014
  - Number recognition (Jowette et al., 2012)
  - Word to Picture and Picture to word matching (van der Meer et al., 2015)
  - Receptive labeling (Lorah & Karnes, 2015)

Introduction

Purpose

- The purpose of this study was to compare traditional materials versus the iPad for teaching receptive labeling to individuals diagnosed with autism.

Participants and Setting

- 3 participants
- ABA home program
- VB-MAPP (Sundberg, 2008)

Mike

- Level 3 range on the VB-MAPP
- Approx. 6 hours a week
- Mike had an extensive repertoire of receptive labels
- Phonetically sound out grade 1 and 2 sight words

Evan

- Home program 2008
- Approx. 15 hours a week
- Over 200 sight words
- Currently working on grade 3 sight words.

Tim

- Level 3 range on the VB-MAPP
- Approx. 4 hours a week
- Approx. 200 receptive labels & 75 sight words

Inclusion Criteria

- ABA program
- Current program goals
- No exclusion based on pervious learning history

Materials

- iPad *See Touch Learn* application

- Traditional materials (Flashcards)

Experimental Design

- Adapted Alternating Treatment design (Sindelar et al.,1985)

Procedure: Selection of Training Sets

iPad Condition

Set 2 - Mike

- Channel
- Challenge
- Character

Set 2 - Evan

- Your
- Kind
- Own

Traditional Condition

Set 2 - Mike

- Delete
- Degree
- Describe

Set 2 - Evan

- Copy
- Idea
- Raise

Response Definitions

- Correct, Incorrect, and prompted responses recorded.
- Observing response
- Dependent variable
  - 80% or higher of independent responses across 2 sessions.

Data Sheet – iPad Condition

Participant #: _____ Date:_____ Initials: ____ Circle: Prim/Seco

Circle the first picture the child points to. Check the child and therapist behaviors that occur.

Session#: _____	Trial	iPad		Phase____	Child Behaviors: Ind	Child Behaviors: PR	Child Behaviors: Obs Pic	Treatment Integrity: Ind	Treatment Integrity: Pr	Treatment Integrity: Obs
	1	challenge	**channel**	character						
	2	channel	character	**challenge**						
	3	**character**	challenge	channel						
	4	challenge	character	**channel**						
	5	channel	**challenge**	character						
	6	**channel**	character	challenge						
	7	challenge	**character**	channel						
	8	channel	character	**challenge**						
	9	**character**	challenge	channel						

% of Ind: _____
% of Trials IOA:_____/9=_____
Number of errors:_____

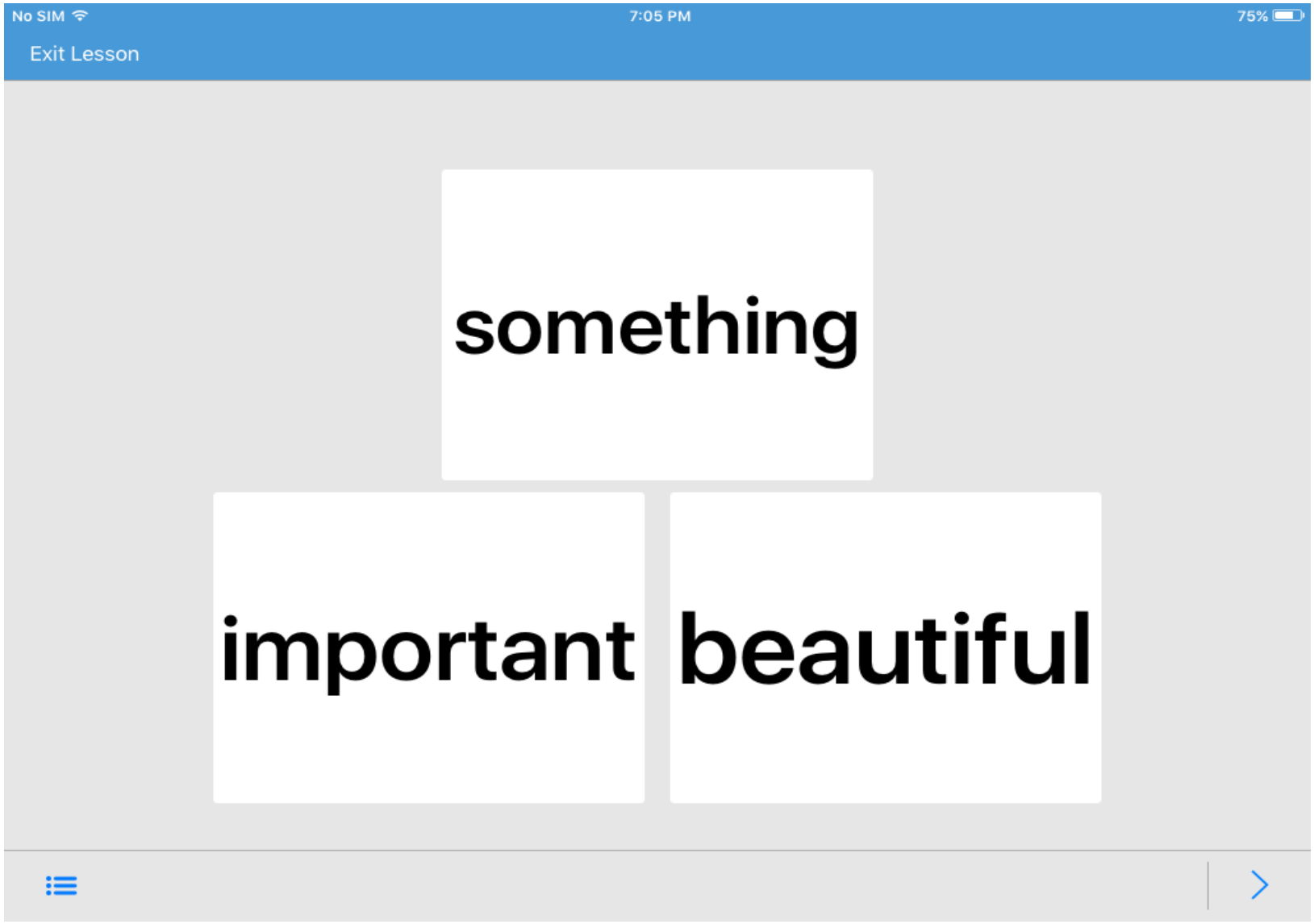
Session#: _____	Trial	iPad		Phase ____	Ind	Pr	Obs Pic	Ind	Pr	Obs
	1	channel	challenge	**character**						
	2	**challenge**	character	channel						
	3	character	**channel**	challenge						
	4	channel	character	**challenge**						
	5	**channel**	challenge	character						
	6	challenge	**character**	channel						
	7	**character**	channel	challenge						
	8	channel	**challenge**	character						
	9	challenge	character	**channel**						

% of Ind: _____
% of Trials IOA:_____/9=_____
Number of errors:_____

Session#: _____	Trial	iPad		Phase _____	Ind	Pr	Obs Pic	Ind	Pr	Obs
	1	**challenge**	character	channel						
	2	character	**channel**	challenge						
	3	channel	challenge	**character**						
	4	channel	**character**	challenge						
	5	character	challenge	**channel**						
	6	**challenge**	channel	character						
	7	channel	character	**challenge**						
	8	**character**	challenge	channel						
	9	channel	**character**	challenge						

% of Ind: _____
% of Trials IOA:_____/9=_____
Number of errors:_____

iPad Condition



Data Sheet – Traditional Condition

Participant #: _____ Date:_____ Initials: ____ Circle: Prim/Seco

Circle the first picture the child points to. Check the child and therapist behaviors that occur.

Session#: _____					Child Behaviors			Treatment Integrity		
	Trial	**Traditional**		**Phase**_____	**Ind**	**Pr**	**Obs Pic**	**Ind**	**Pr**	**Obs**
	1	better	**light**	thought						
	2	**thought**	better	light						
	3	light	thought	**better**						
	4	**better**	light	throught						
	5	light	**thought**	better						
	6	thought	better	**light**						
	7	**better**	light	thought						
	8	**thought**	better	light						
	9	better	**light**	thought						

% of Ind: _____
% of Trials IOA:_____/9=_____
Number of errors:_____

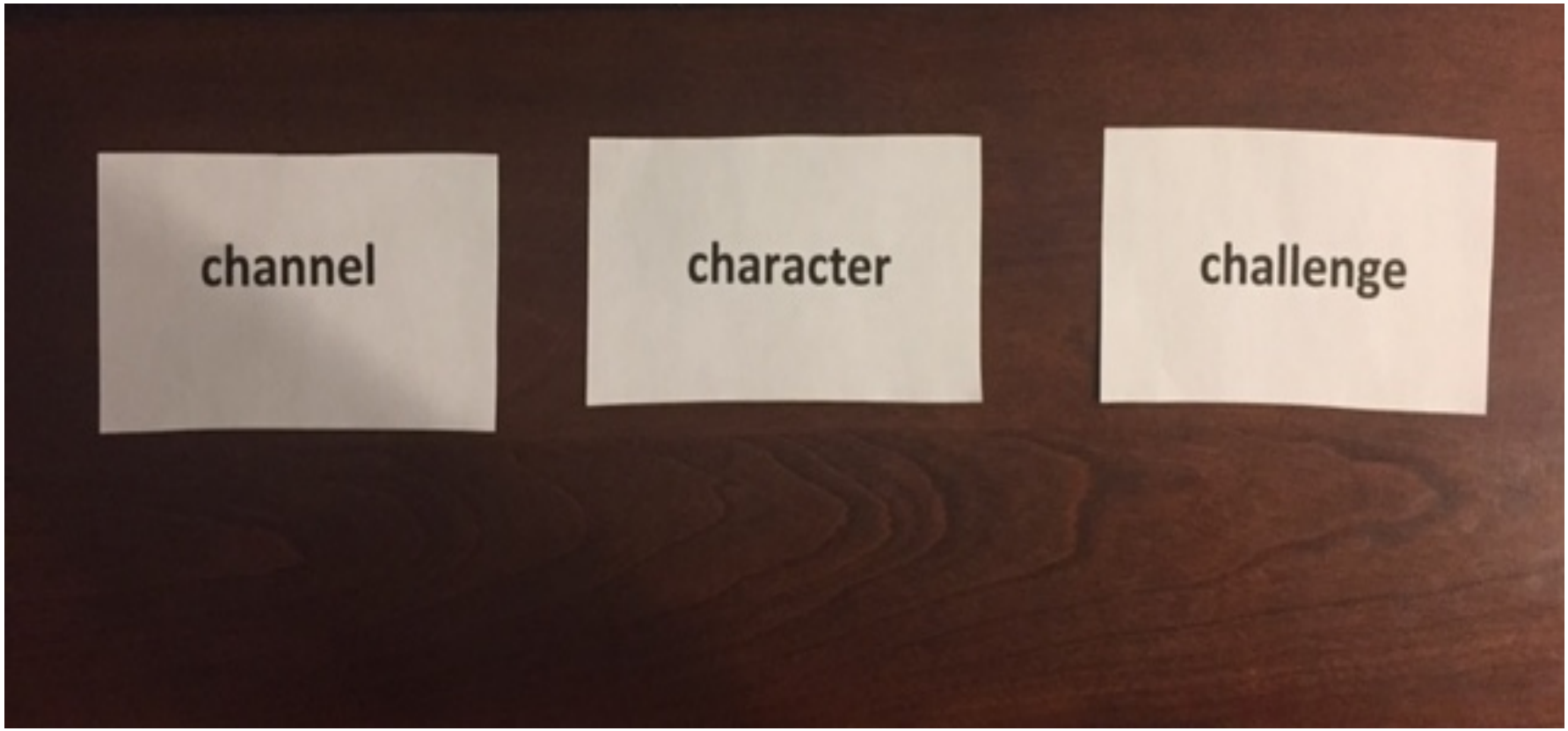
Session#: _____										
	Trial	**Traditional**		**Phase**_____	**Ind**	**Pr**	**Obs Pic**	**Ind**	**Pr**	**Obs**
	1	light	better	**thought**						
	2	**better**	thought	light						
	3	thought	**light**	better						
	4	light	thught	**better**						
	5	better	**thought**	light						
	6	**light**	better	thought						
	7	better	thought	**light**						
	8	light	**better**	thought						
	9	**thought**	light	better						

% of Ind: _____
% of Trials IOA:_____/9=_____
Number of errors:_____

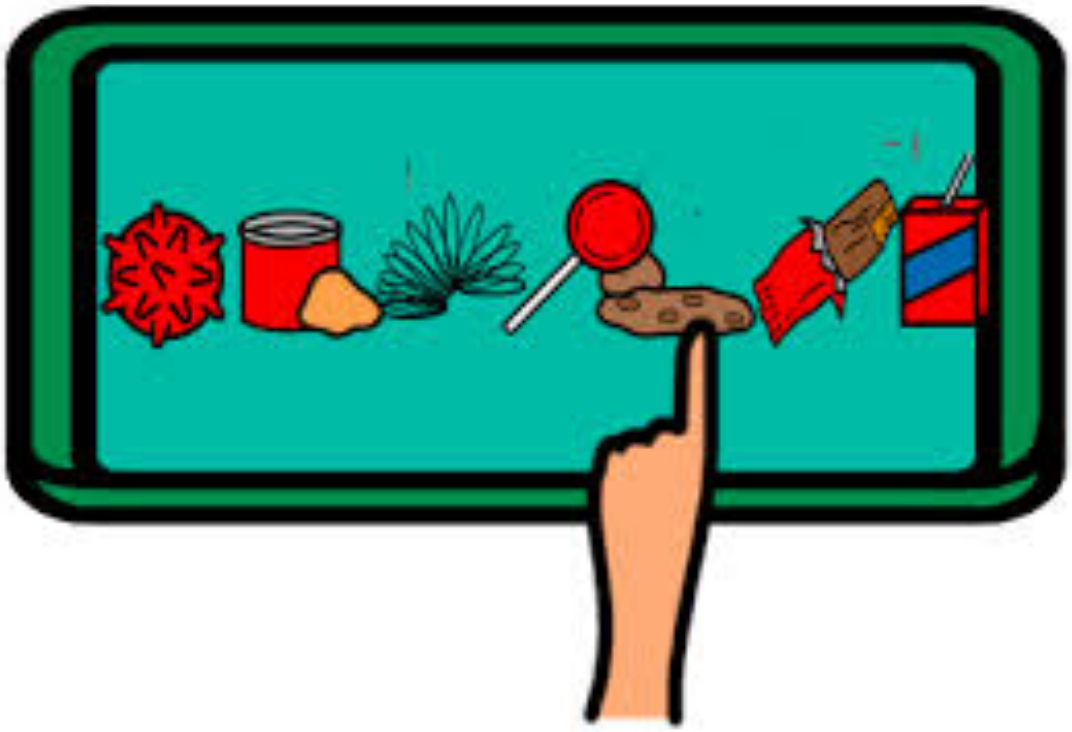
Session#: _____										
	Trial	**Traditional**		**Phase** _____	**Ind**	**Pr**	**Obs Pic**	**Ind**	**Pr**	**Obs**
	1	thought	**better**	light						
	2	**light**	thought	better						
	3	better	light	**thought**						
	4	thought	**light**	better						
	5	light	thought	**better**						
	6	**thought**	better	light						
	7	better	throught	**light**						
	8	light	**better**	thought						
	9	**thought**	light	better						

% of Ind: _____
% of Trials IAO:_____/9=_____
Number of errors:_____

Traditional Condition



Procedure: Preference Assessment
Brief MSWO



Procedure: Baseline

- Reinforcement provide on a VR3 schedule
- No prompts
- Auditory stimulus consisted of the item name only (e.g., balloon)

Procedure: Teaching procedure

- Conditional only method
  - Counterbalanced

- Progressive prompt delay
  - Phases 1:
    - 0-second prompt delay
  - Phases 2:
    - 1-second prompt delay
  - Phase 3:
    - 3-second prompt delay

Procedure: Maintenance & Generalization

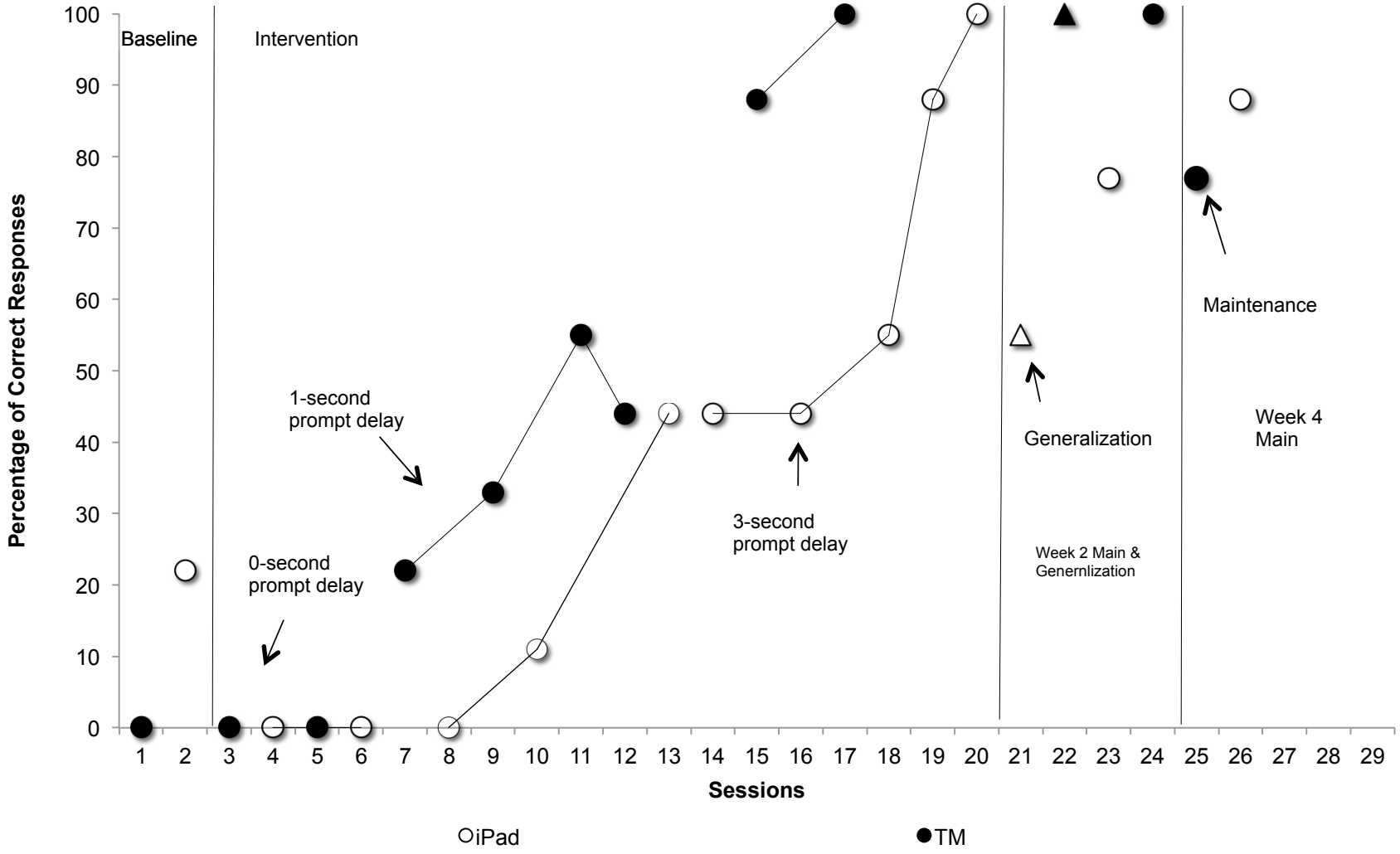
- **Maintenance probes**
  - Conducted following baseline procedures

- **Generalization probes**
  - Two-dimensional stimuli → iPad
  - iPad stimuli → Two-dimensional

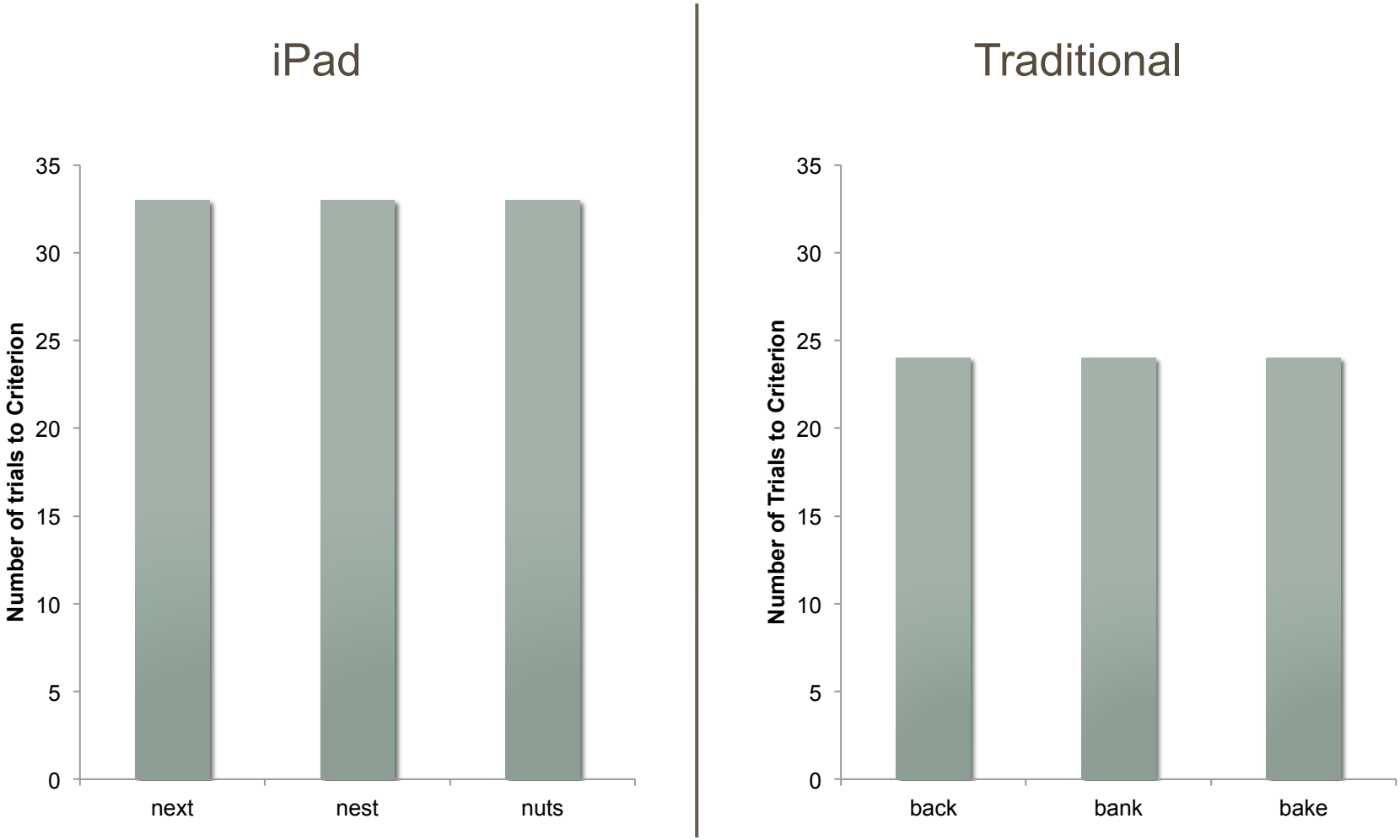
Interobserver Agreement

- Mike
  - Set 1 98.8% (88% – 100%)
  - Set 2 100%
- Evan
  - Set 1 96.7% (77%- 100%)
  - Set 2 100%
- Tim
  - Set 1 99.0% (88 – 100%)

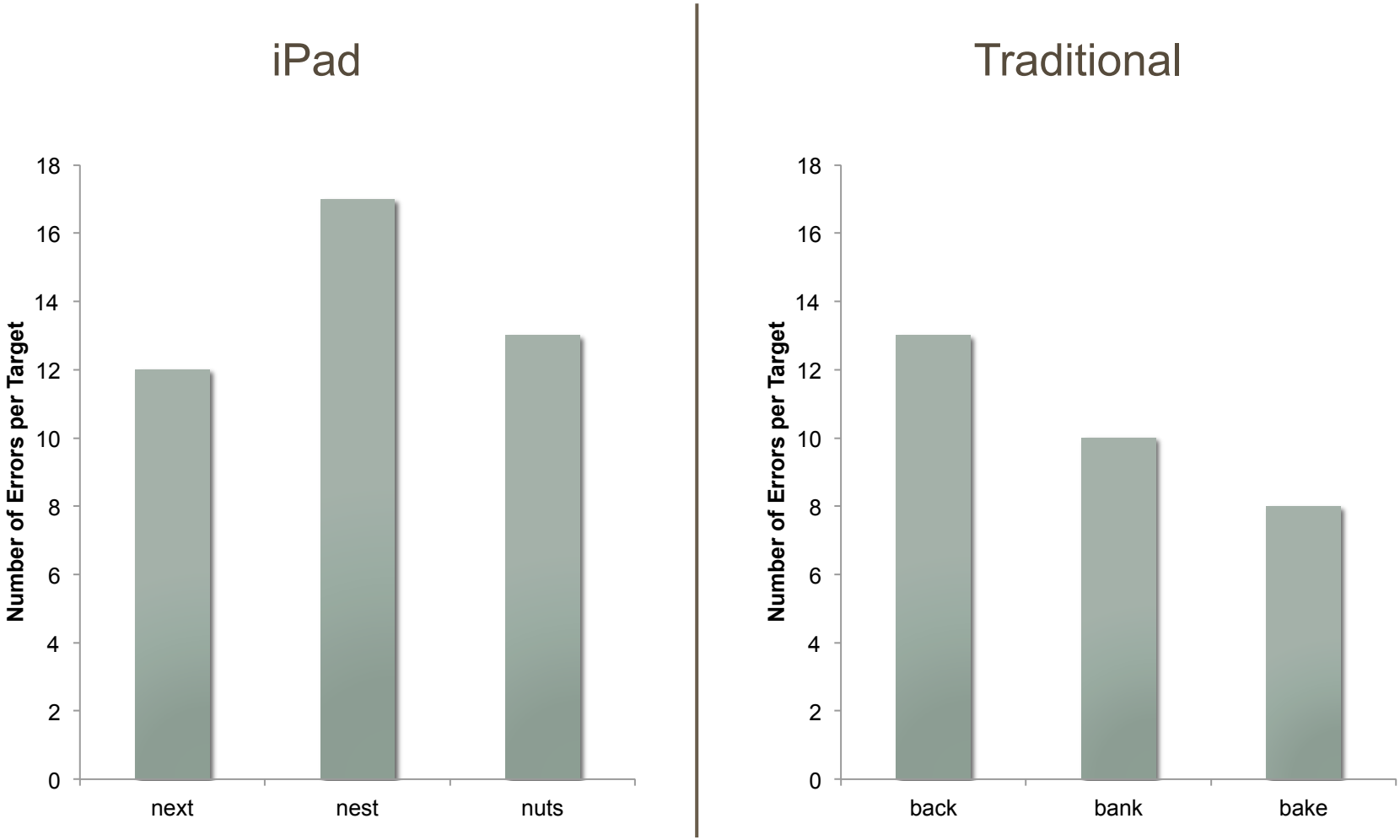
Results – Mike Set 1



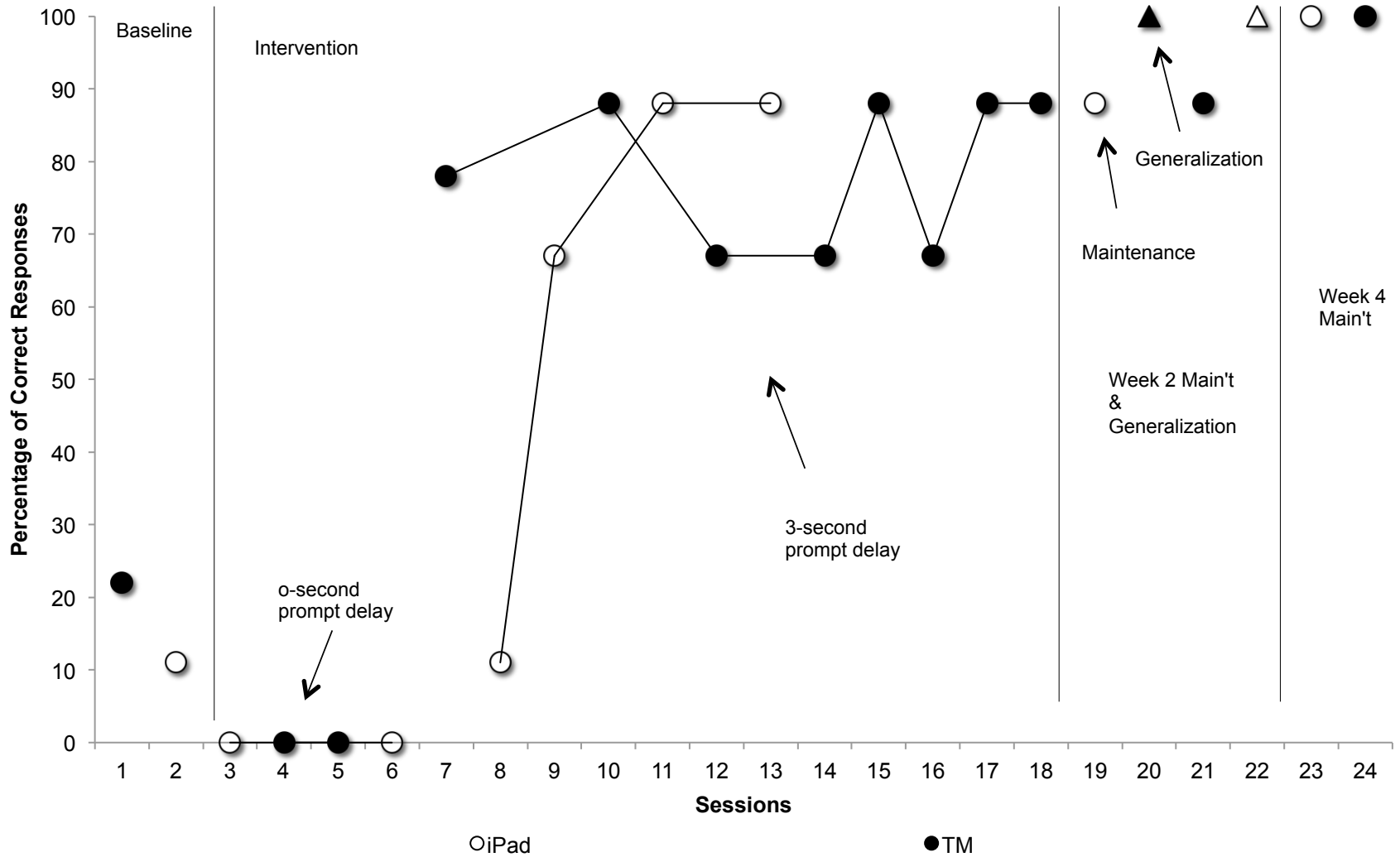
Trials to Criterion – Set 1



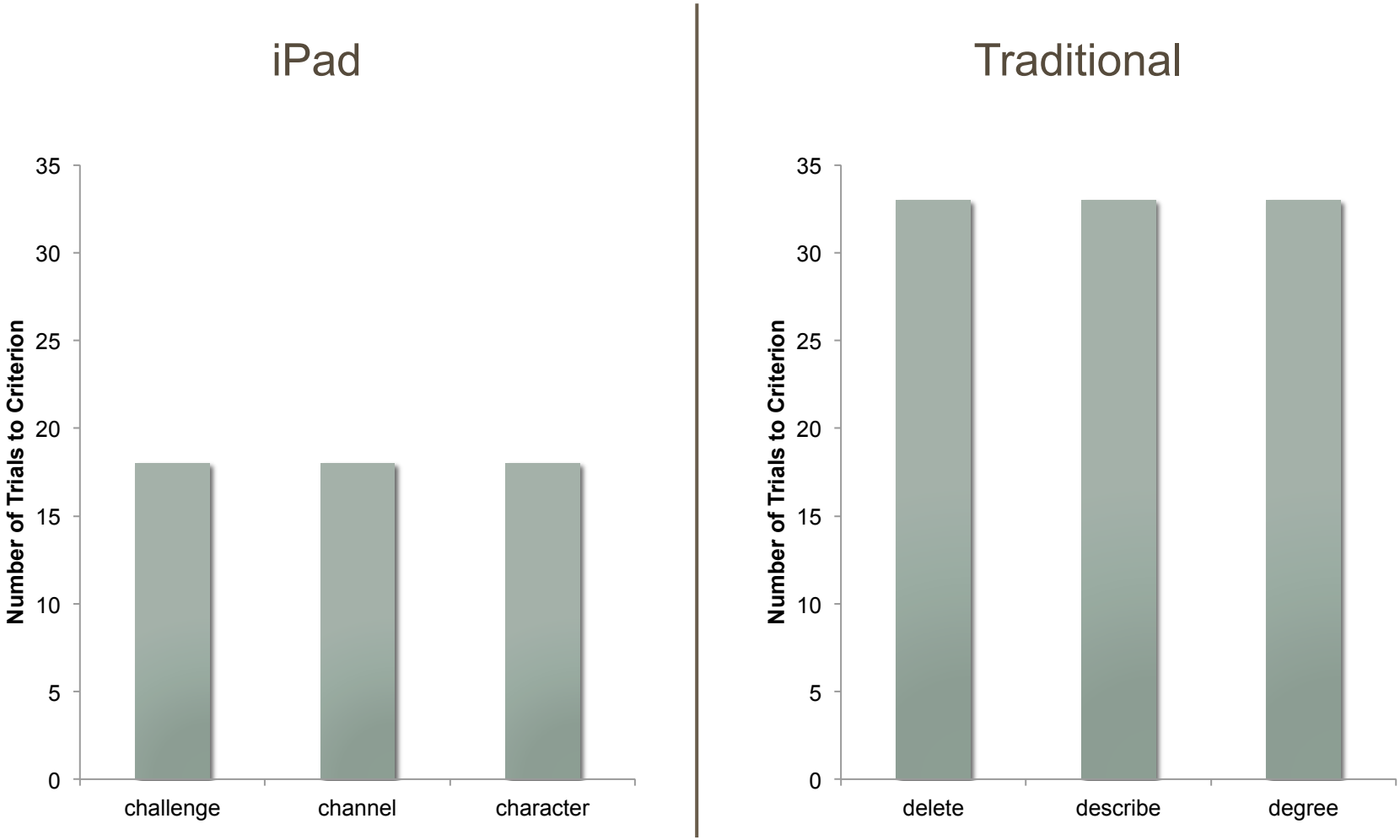
Errors per Target – Set 1



Results – Mike Set 2



Trials to Criterion – Set 2



Errors per Target – Set 2

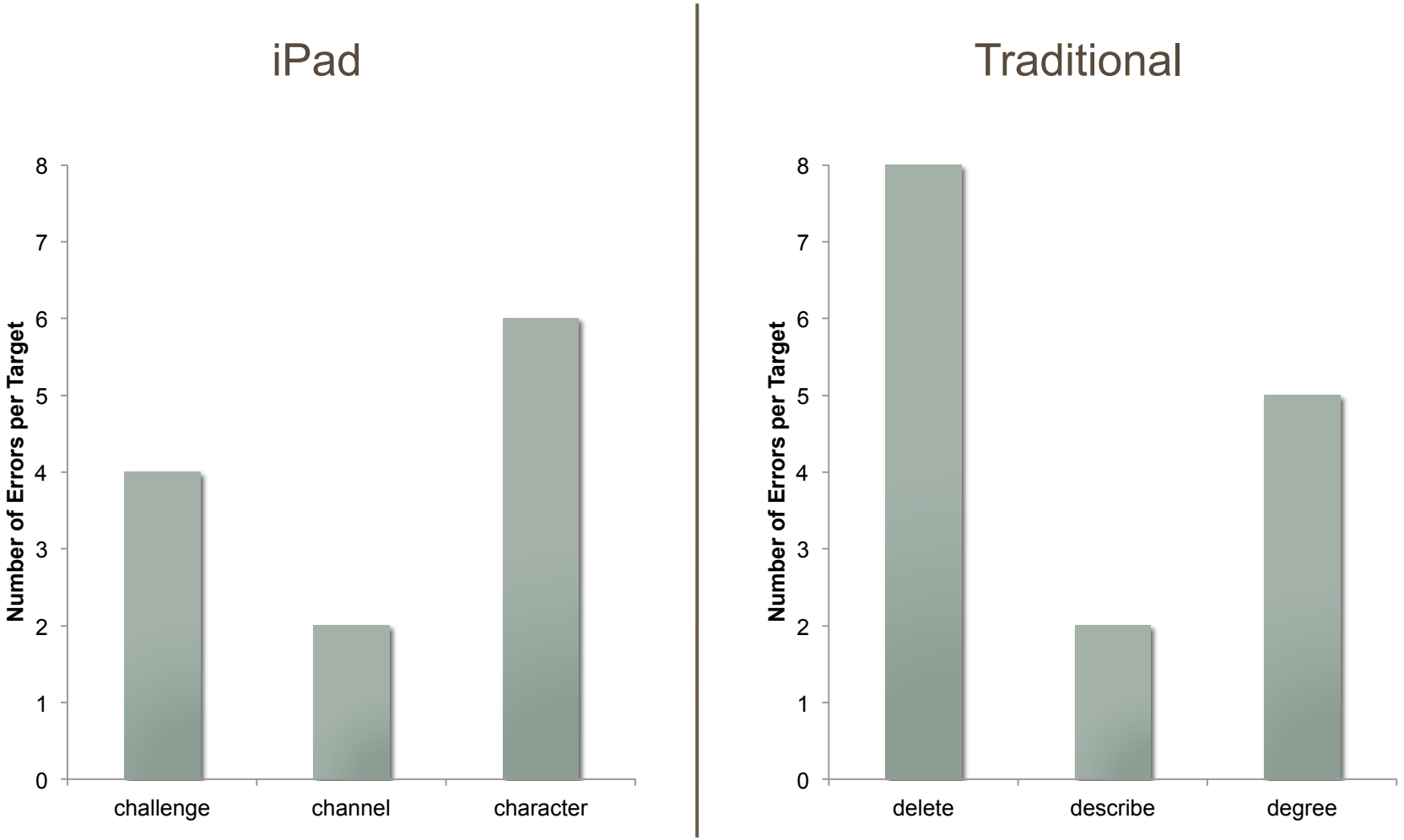
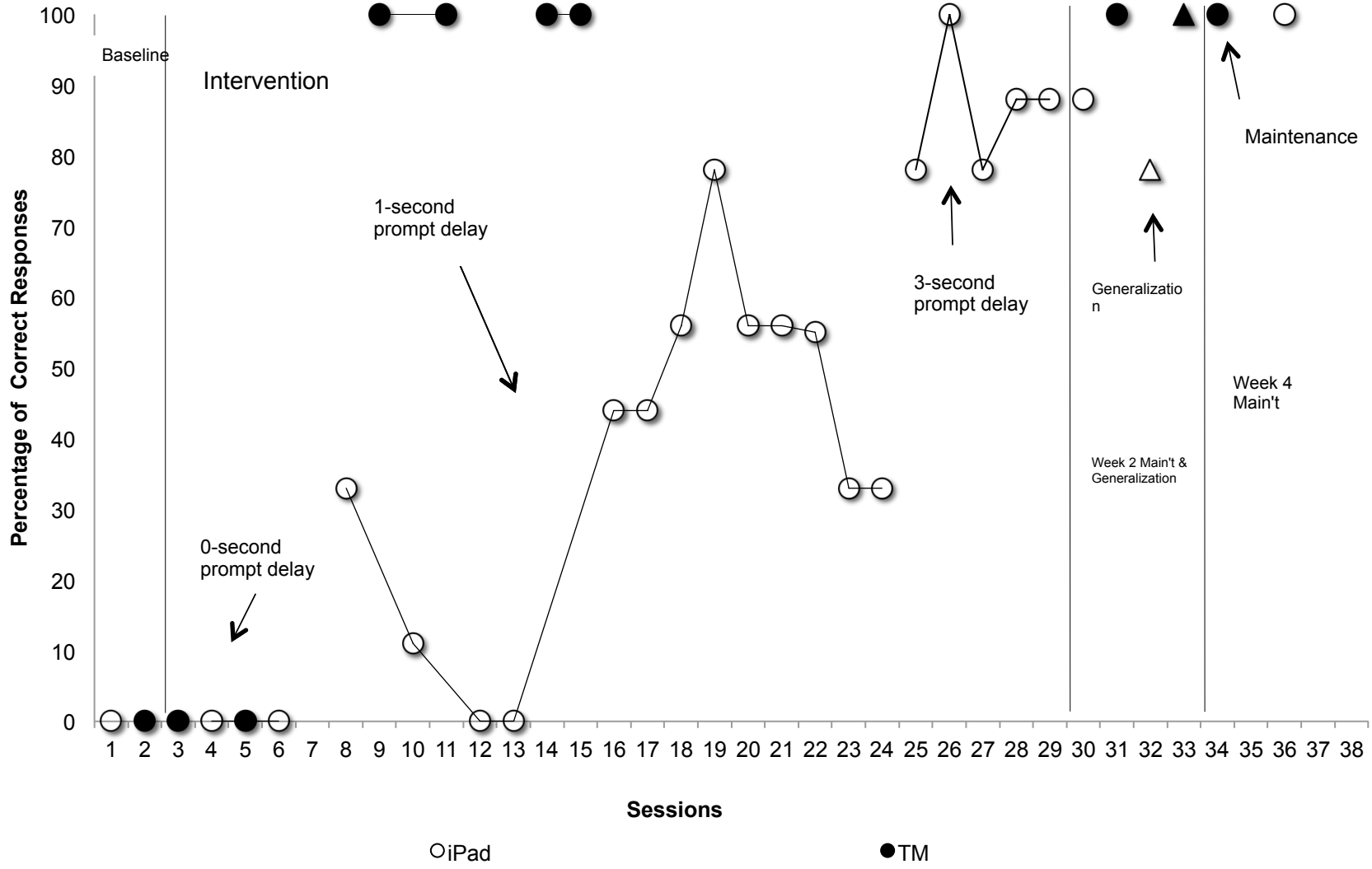


Table 1

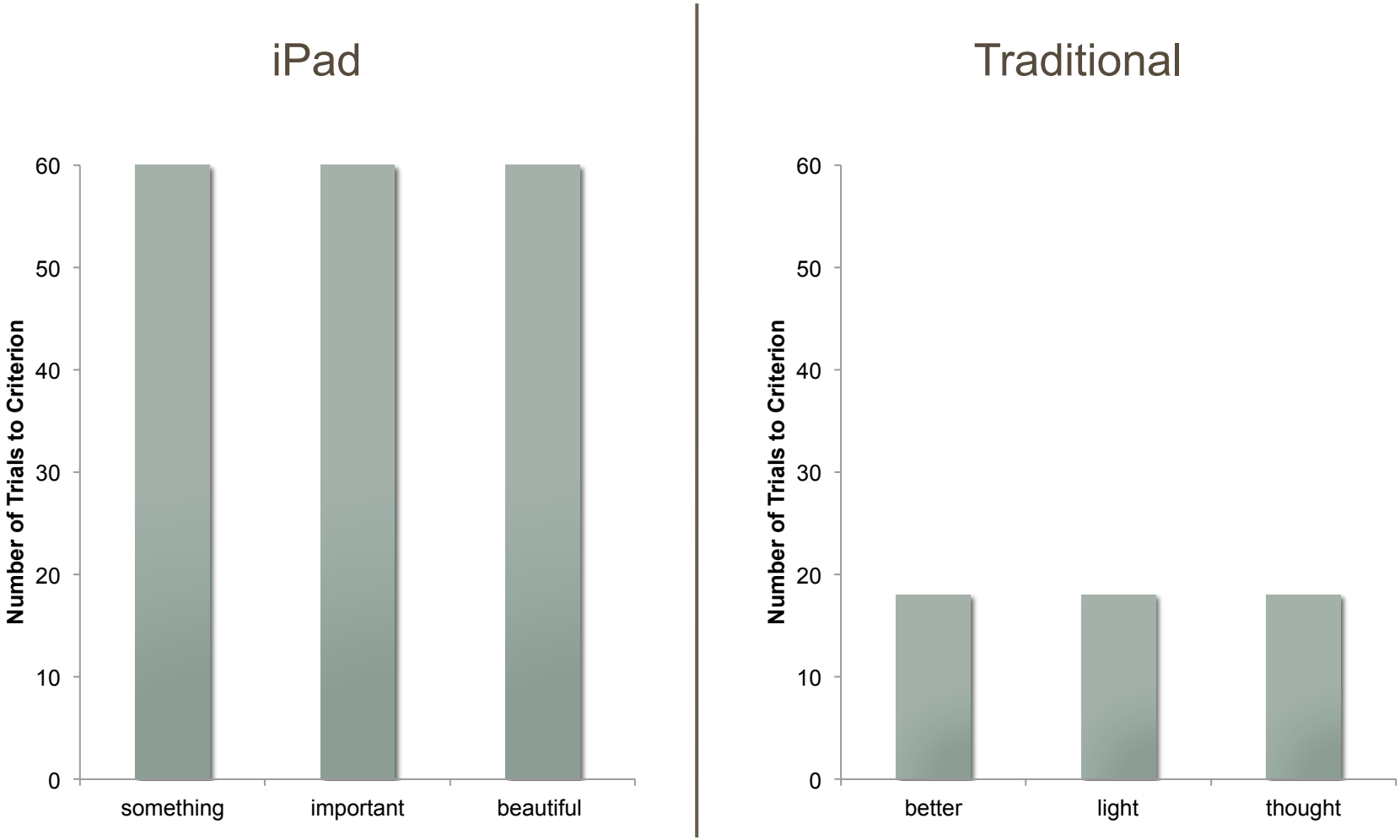
Method / Set	No. of trials	No. of sessions	Total No. of errors	% of error per trial	2-week Maintenance probe % correct	4-week Maintenance probe % correct	2-Week Generalization probe % correct
Mike Set 1							
iPad - next	33	10	12	36.3	100	100	100
iPad - nest	33	10	17	51.5	33	100	33
iPad - nuts	33	10	13	39.3	100	66	33
TM - back	24	8	13	54.1	100	66	100
TM - bank	24	8	10	41.6	100	100	100
TM - bake	24	8	8	33.3	100	66	100
Set 2							
iPad – challenge	18	6	4	22.2	100	100	100
iPad – channel	18	6	2	11.1	100	100	100
iPad – character	18	6	6	33.3	66	100	100
TM - delete	33	10	8	24.2	100	100	100
TM - describe	33	10	2	6.0	66	100	100
TM - degree	33	10	5	15.1	100	100	100

Table 1. Number of sessions and trials required to achieve mastery criteria, number of errors, and percentage of errors per target in each condition for Mike.

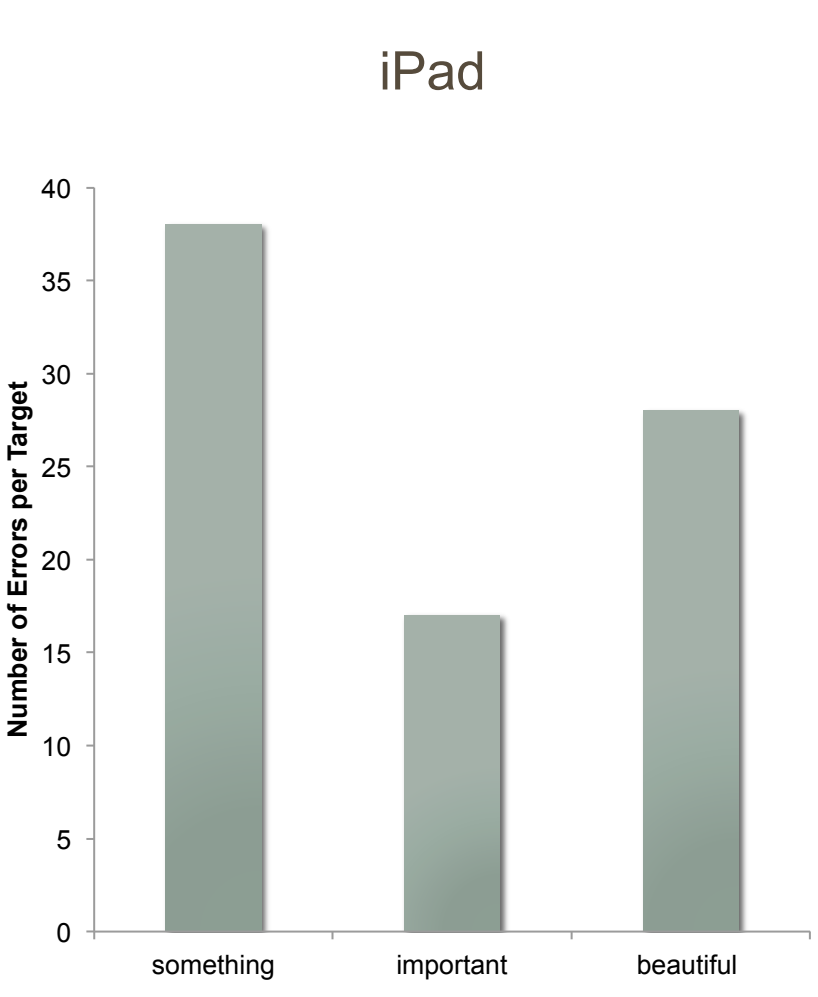
Results – Evan Set 1

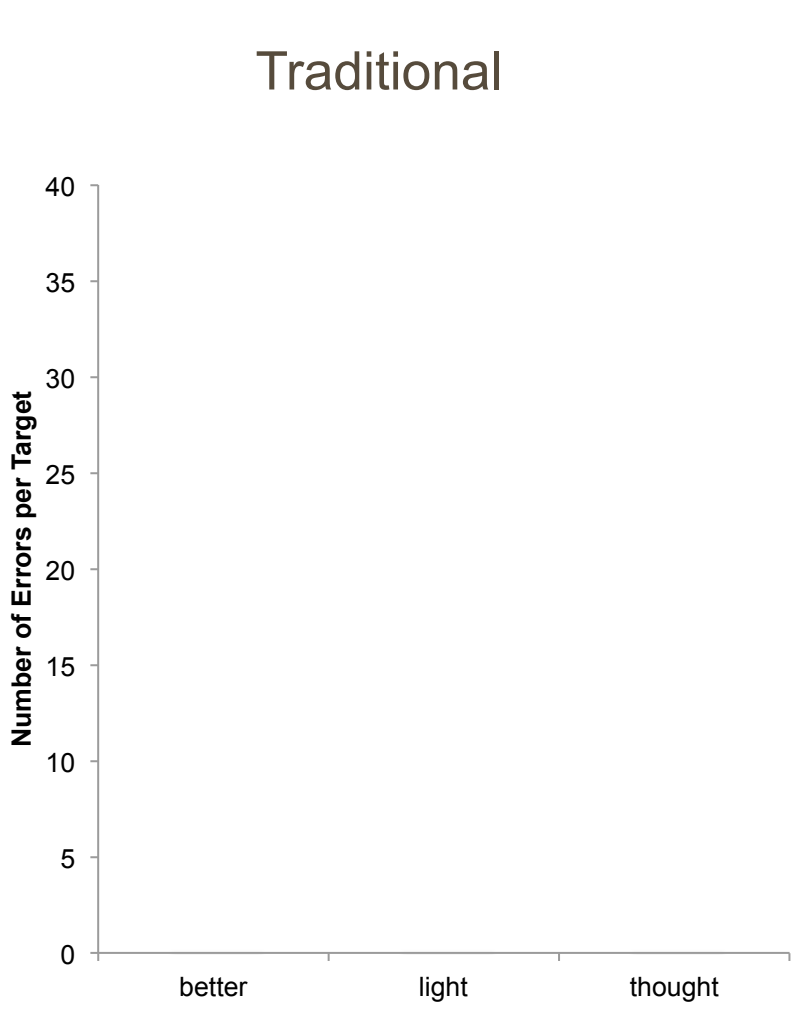


Trials to Criterion – Set 1

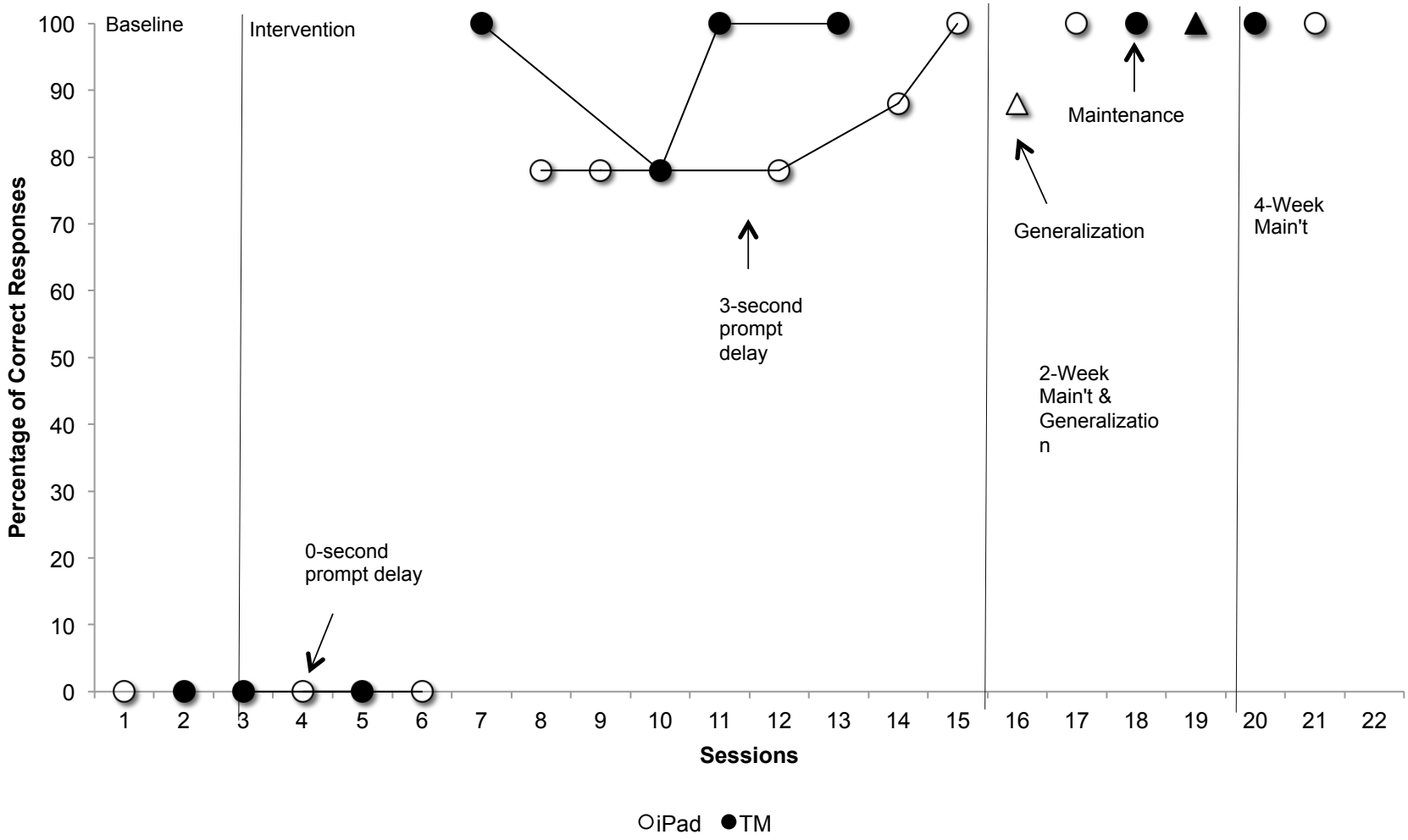


Errors per Target – Set 1

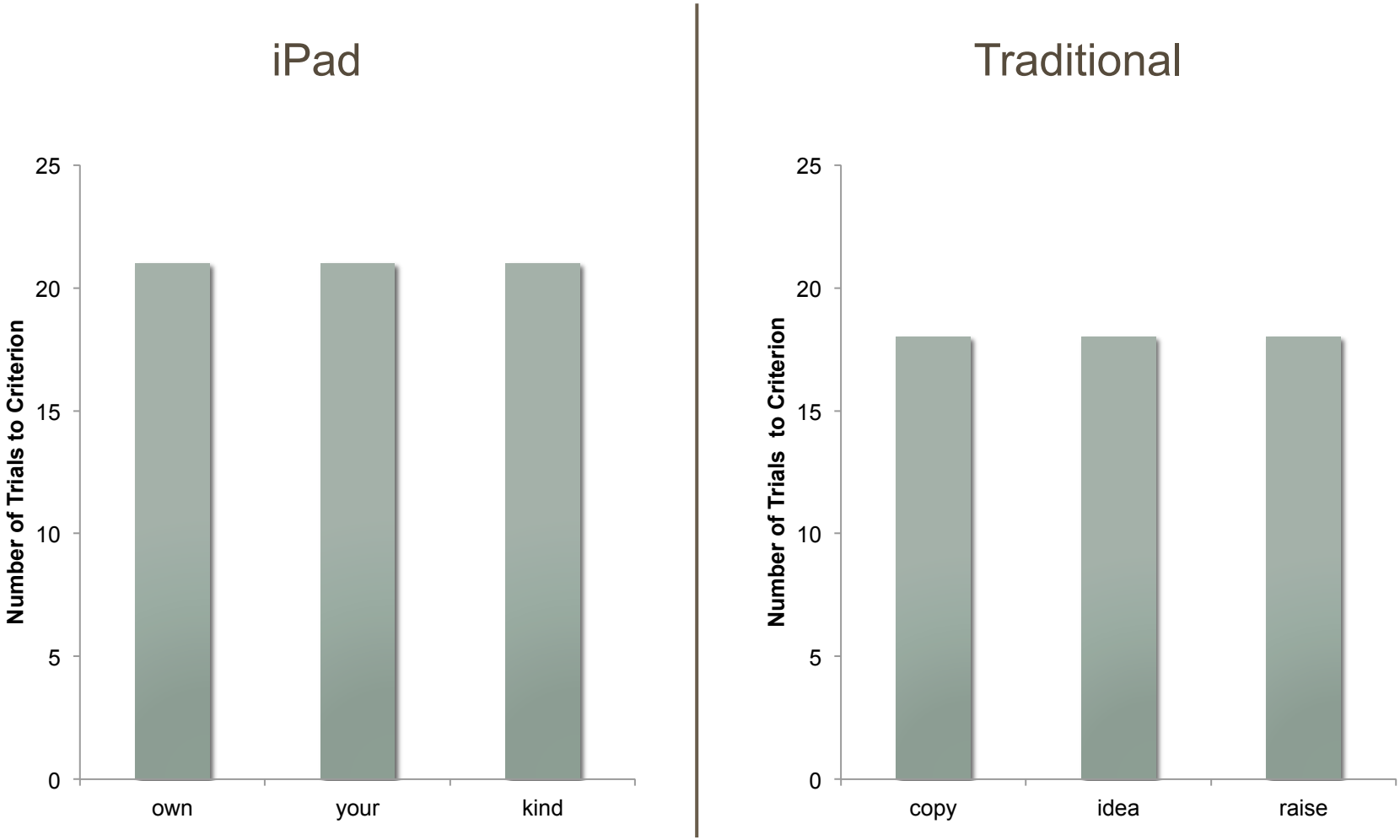




Results – Evan Set 2



Trials to Criterion – Set 2



Errors per Target– Set 2

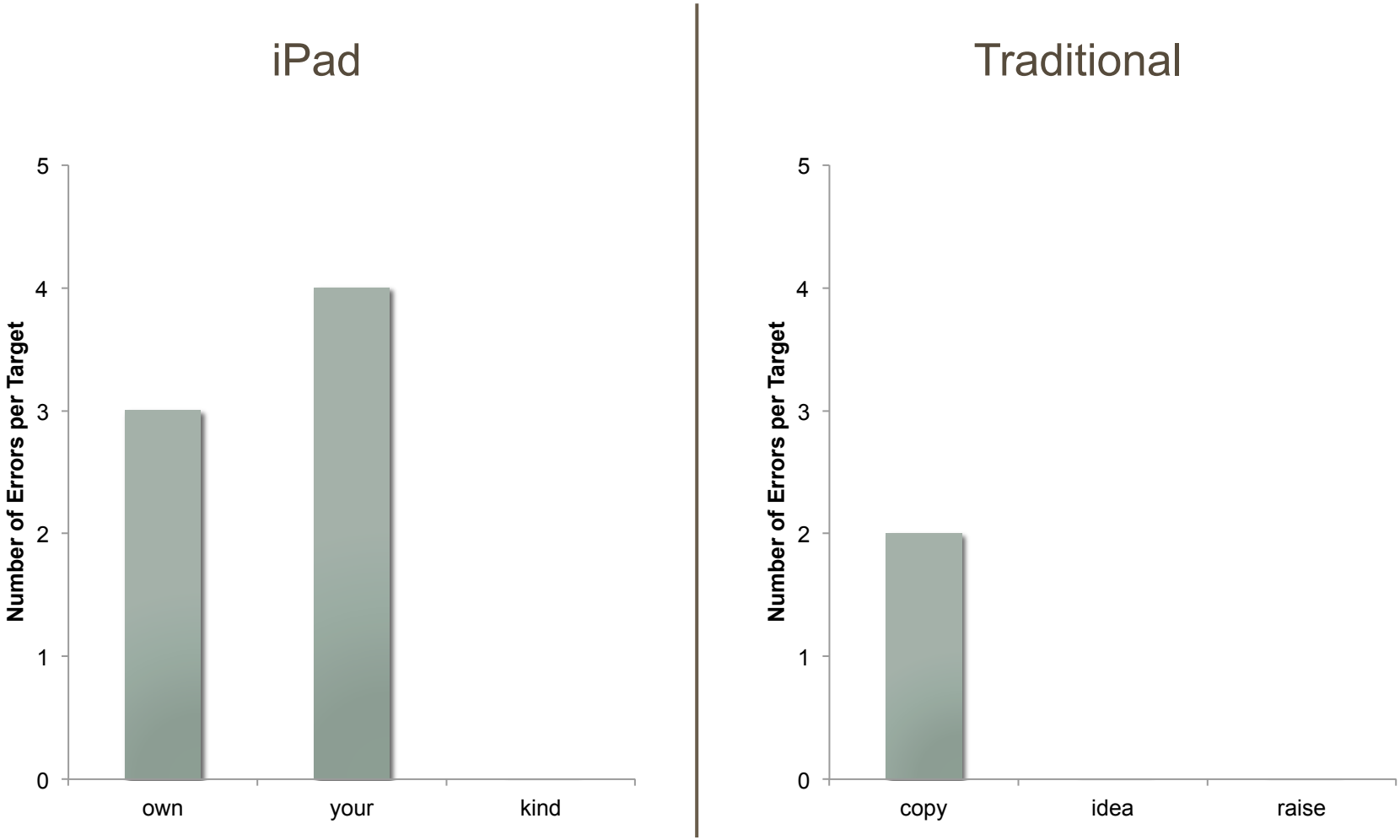
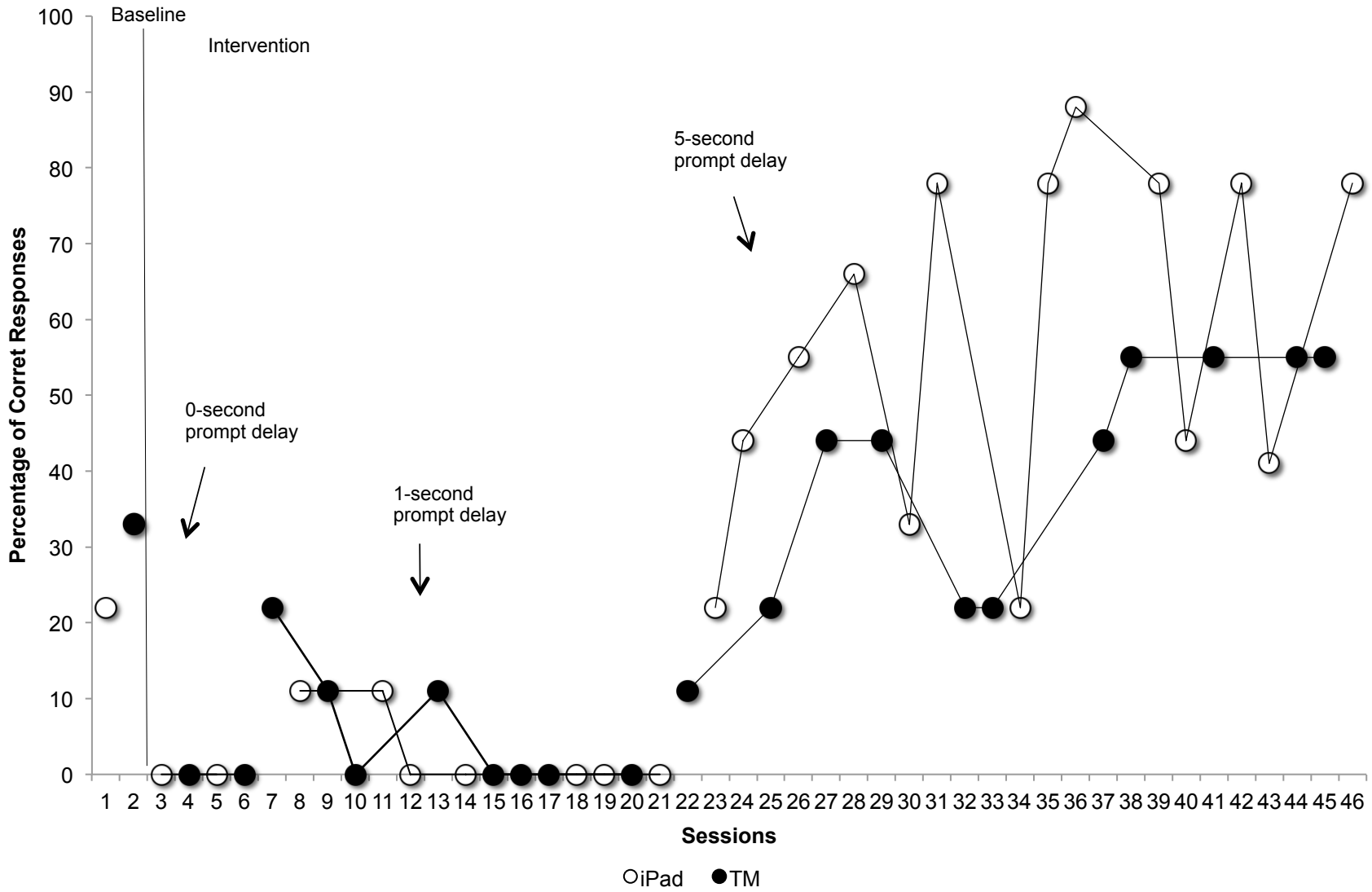


Table 2

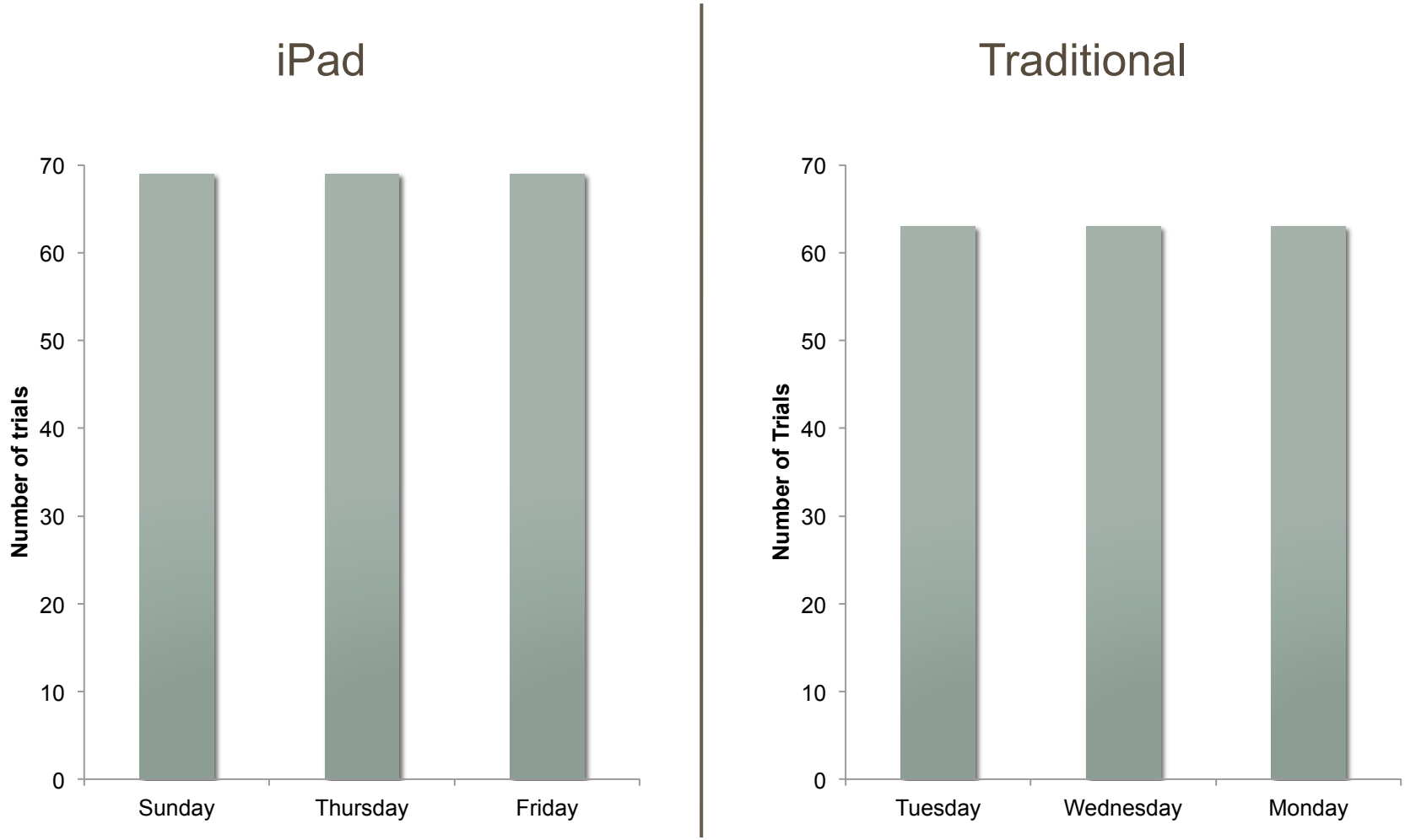
Method / Set	No. of trials	No. of sessions	Total No. of errors	% of error per trials	2-week Maintenance probe % correct	4-week Maintenance probe % correct	2-Week Generalization probe % correct
Evan Set 1							
iPad - Something	60	20	38	63.3	66	100	66
iPad - important	60	20	17	28.3	100	100	66
iPad - beautiful	60	20	28	46.6	100	100	100
TM - better	18	6	0	0	100	100	100
TM - light	18	6	0	0	100	100	100
TM - thought	18	6	0	0	100	100	100
Set 2							
iPad – own	21	7	3	14.2	100	100	100
iPad – your	21	7	4	19.0	100	100	66
iPad – kind	21	7	0	0	100	100	100
TM - copy	18	6	2	11.1	100	100	100
TM - idea	18	6	0	0	100	100	100
TM - raise	18	6	0	0	100	100	100

Table 2. Number of sessions and trials required to achieve mastery criteria, number of errors, and percentage of errors per target in each condition for Evan.

Results – Tim Set 1



Number of Trials – Set 1



Errors per Target – Set 1

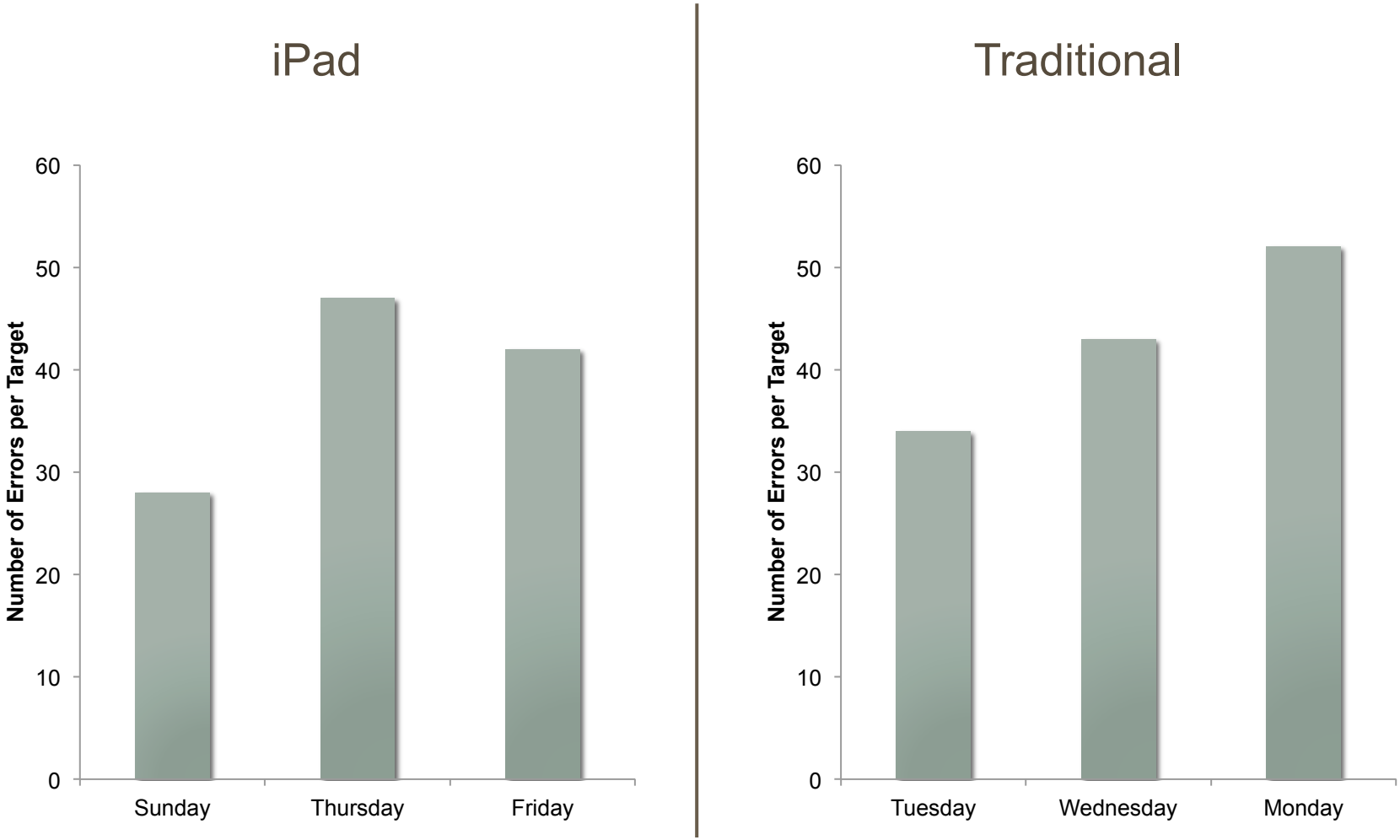


Table 3

Method / Set	No. of trials	No. of sessions	Total No. of errors	% of error per trials	2-week Maintenance probe % correct	4-week Maintenance probe % correct	2-Week Generalization probe % correct
Tim Set 1							
iPad - Sunday	69	23	28	44.4	NA	NA	NA
iPad - Thursday	69	23	47	74.6	NA	NA	NA
iPad - Friday	69	23	42	66.6	NA	NA	NA
TM - Tuesday	63	21	34	53.9	NA	NA	NA
TM - Wednesday	63	21	43	68.2	NA	NA	NA
TM - Monday	63	21	52	82.5	NA	NA	NA

Table 3. Number of sessions and trials required to achieve mastery criteria, number of errors, and percentage of errors per target in each condition for Tim.

Discussion

the	to
and	he

Discussion

- Efficiency in teaching not merely based on the number of trials

- Number of errors
  - Emotional responses (Green, 2001).

Discussion - Disruptive behaviors

- Problem behaviors did not occur during the iPad condition
- Disruptive behaviors anecdotally contributed to decrease in correct responding

Discussion

- History with errorless learning

- Limitation not all participants achieved mastery at 1-second prompt delay

Discussion

- History of reinforcement

- Assessing learner preferences for learning conditions (Hanley, 2010)

Discussion

- History with iPad for leisure activities.
  - No pervious learning history of receptive skills on the iPad.
- Future research
  - Prerequisite skills for learning on the iPad
- Generalization

Clinical Considerations

- Decrease in challenging / problematic behaviour (Neely et al., 2013, Lee et al., 2013)
- Use to establish instructional control
  - Generalize to 2D materials

Discussion

- The present study contributes to previous research
  - iPad can be used to teach skills to individuals with ASD following behavioral principles.

- Traditional materials were move efficient

Questions

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