

A Practice-based Translation Approach to Conducting Research Syntheses



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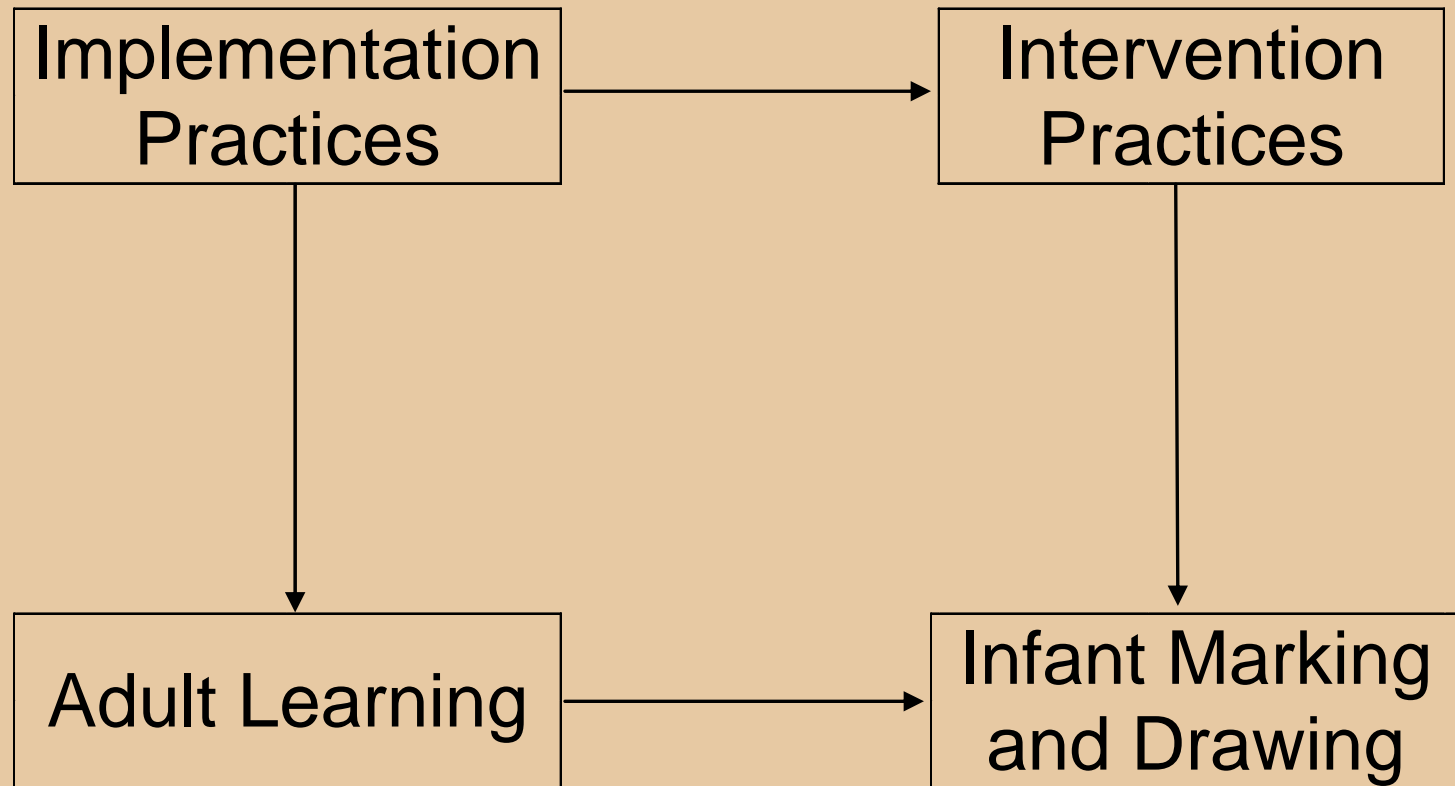
Purpose of the Presentation

- Describe a practice-based translational approach to conducting research syntheses
- Illustrate the approach using several syntheses of implementation and intervention practices
- Illustrate how the findings from the synthesis were used to develop evidence-based intervention and implementation practices

Two Types of Evidence-Based Practices

- Evidence-Based Implementation Practices
 - Adult learning methods
- Evidence-Based Intervention practices
 - Infant and Toddler Mark Making and Scribbling
 - Literacy-Rich Environments and Pre-Literacy Development
 - Characteristics of Early Shared Reading and Early Language Development

Relationship Between Implementation and Intervention Practices



Types of Research Syntheses

- Efficacy Syntheses
- Efficiency Syntheses
- Translational Syntheses

Purpose of Efficacy Syntheses

Ascertain the size of effect for an intervention (treatment, practice, etc.) comparing the outcome against a nonintervention group. Efficacy syntheses combine findings from different studies using randomized controlled trials or similar types of research designs.

Purpose of Efficiency Syntheses

Ascertain the size of effect for the difference between two or more contrasting interventions (treatments, practices, etc.)
Efficiency syntheses focus on which types of interventions under which conditions are associated with the largest effect size on outcomes of interest.

Purpose of Translational Syntheses

Ascertain the size of effect for the characteristics and features of an intervention (treatments, practices, etc.) that are associated with study outcomes. Translational syntheses focus on ***unpacking*** and ***unbundling*** an intervention to isolate those practice characteristics that “matter most” in terms of explaining the results found in different studies of the same or similar interventions.

Adult Learning Research Syntheses^a

- Research synthesis of 79 studies of accelerated learning, coaching, guided design, and just-in-time-training
- 58 randomized control design studies and 21 comparison group studies
- 3,152 experimental group participants and 2,988 control or comparison group participants
- Combination of studies in college and noncollege settings
- Learner outcomes included learner knowledge, skills, attitudes, and self-efficacy beliefs
- Weighted average Cohen's *d* effect sizes for the post test differences between the intervention and nonintervention or comparison groups were used for assessing the impact of the adult learning methods.

^a Trivette, C.M. et al. (2009). Characteristics and consequences of adult learning methods and strategies. *Winterberry Research Syntheses*, Vol. 2, Number 1.

Six Characteristics Identified in *How People Learn*^a Were Used to Code and Evaluate the Adult Learning Methods

Planning

- | | |
|------------|---|
| Introduce | Engage the learner in a preview of the material, knowledge or practice that is the focus of instruction or training |
| Illustrate | Demonstrate or illustrate the use or applicability of the material, knowledge or practice for the learner |

Application

- | | |
|----------|--|
| Practice | Engage the learner in the use of the material, knowledge or practice |
| Evaluate | Engage the learner in a process of evaluating the consequence or outcome of the application of the material, knowledge or practice |

Deep Understanding

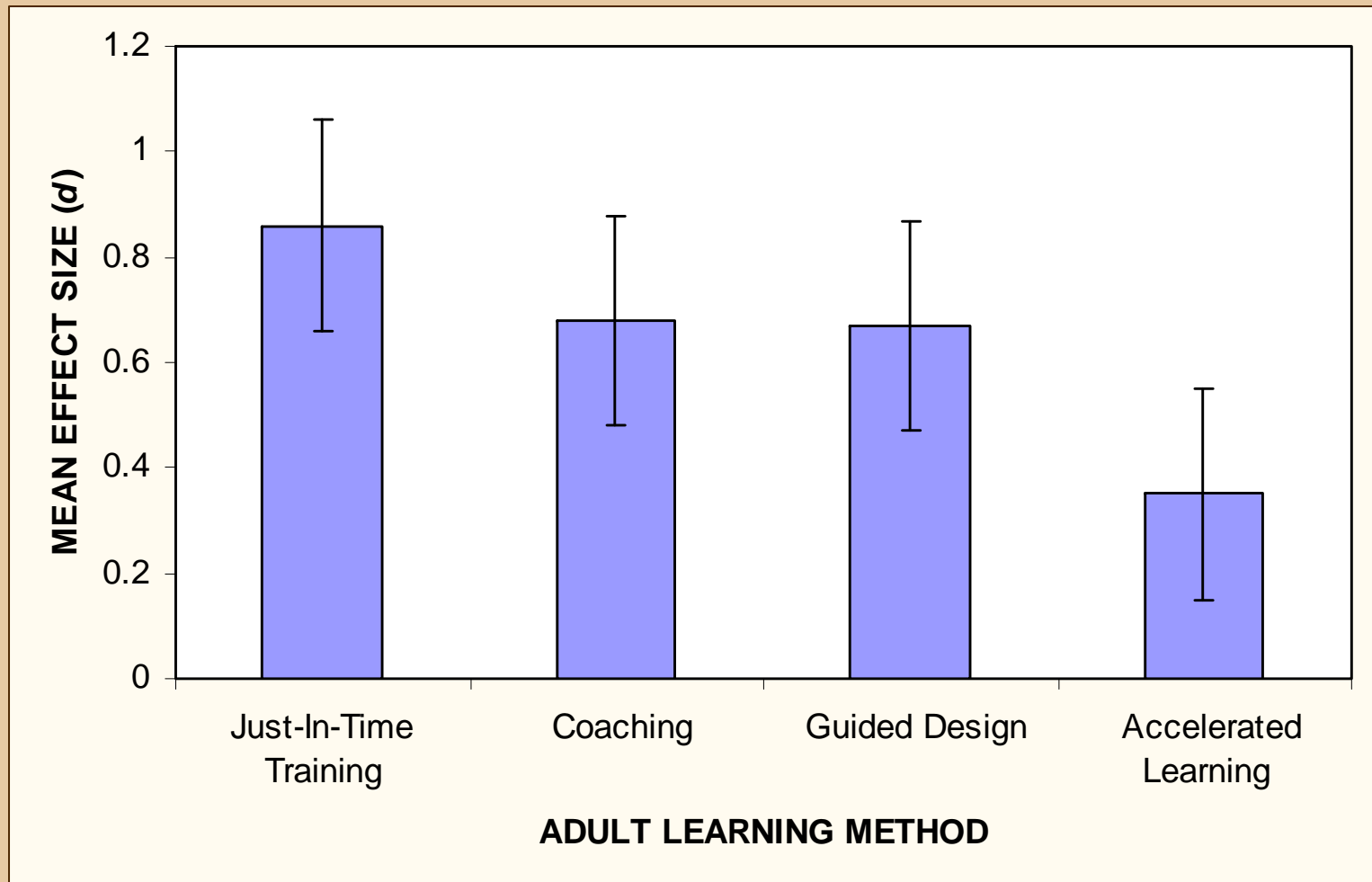
- | | |
|------------|---|
| Reflection | Engage the learner in self-assessment of his or her acquisition of knowledge and skills as a basis for identifying “next steps” in the learning process |
| Mastery | Engage the learner in a process of assessing his or her experience in the context of some conceptual or practical model or framework, or some external set of standards or criteria |

^a Donovan, M. et al. (Eds.) (1999). *How people learn*. Washington, DC: National Academy Press.

Efficacy of the Adult Learning Methods

Effect size for the intervention vs. nonintervention group comparisons is $d = .56$ (95% Confidence Interval = .41 to .71).

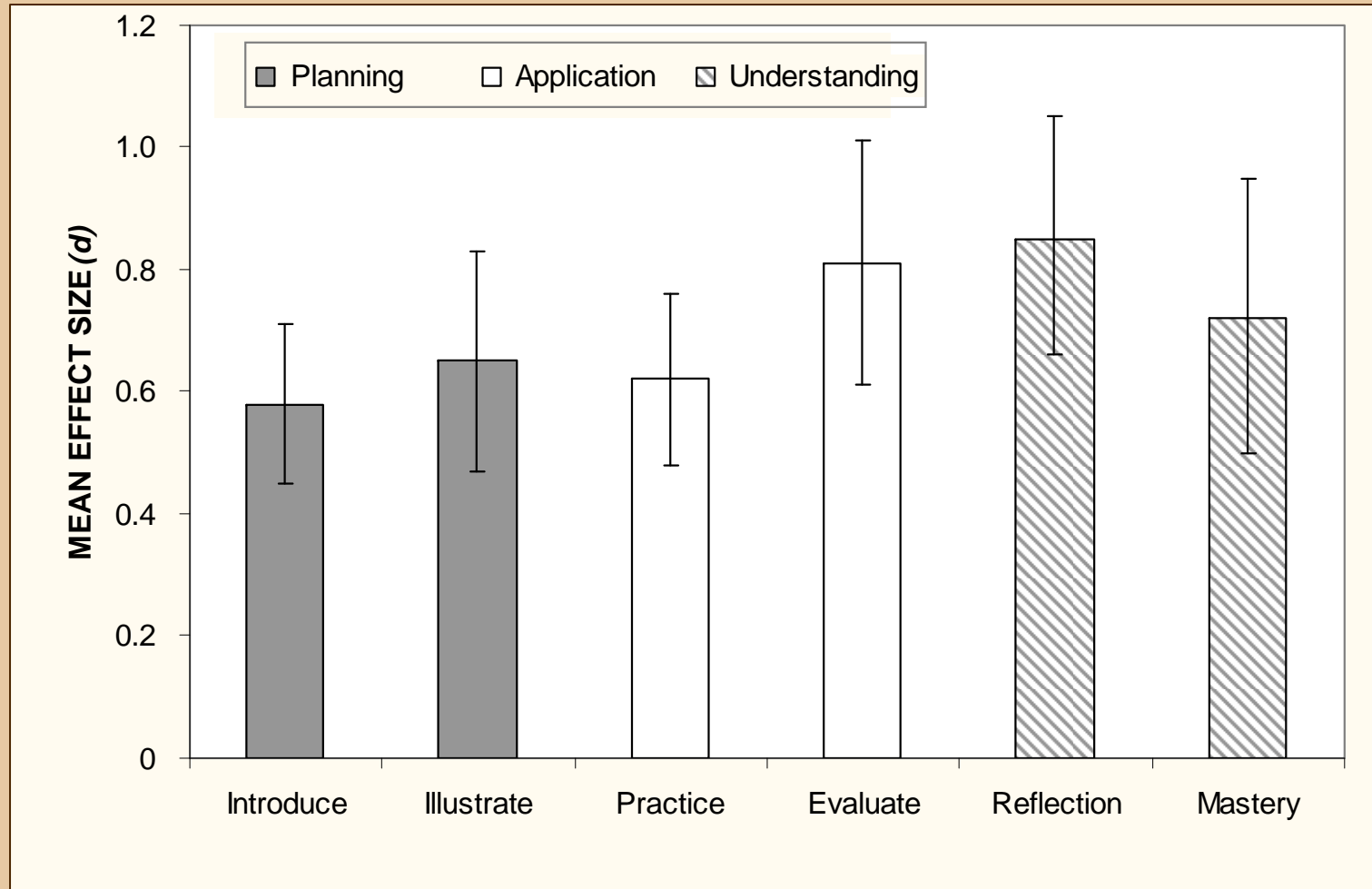
Efficiency of the Four Adult Learning Methods



Translational Findings

Process for unpacking and unbundling the key characteristics of the adult learning methods

Effect Sizes for the Six Adult Learning Characteristics



Effect Sizes for Introducing Information to Learners

Practices	Number		Mean Effect Size (<i>d</i>)	95% Confidence Interval
	Studies	Effect Sizes		
Pre-class exercises	9	9	1.02	.63-1.41
Out of class activities/self-instruction	12	20	.76	.44-1.09
Classroom/workshop lectures	26	108	.68	.47-.89
Dramatic readings	18	40	.35	.13-.57
Imagery	7	18	.34	.08-.59
Dramatic readings/imagery	4	11	.15	-.33-.62

Effect Sizes for Learner Application

Practices	Number		Mean Effect Size (<i>d</i>)	95% Confidence Interval
	Studies	Effect Sizes		
Real life application + role playing	5	20	1.10	.48-1.72
Problem solving tasks	16	29	.67	.39-.95
Real life application	17	83	.58	.35-.81
Learning games/writing exercises	9	11	.55	.11-.99
Role playing (skits, plays)	11	35	.41	.21-.62

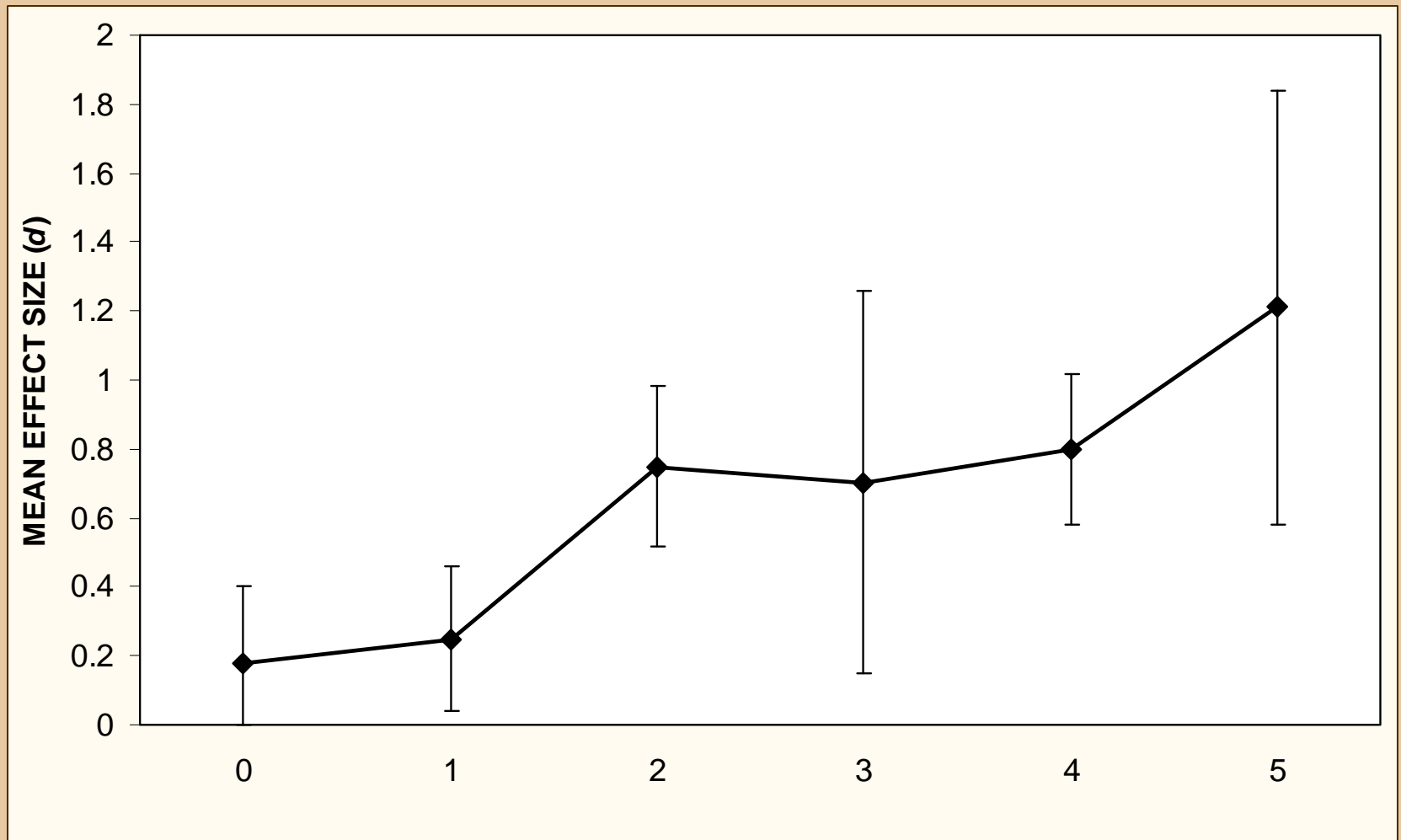
Effect Sizes for Learner Reflection

Practices	Number		Mean Effect Size (<i>d</i>)	95% Confidence Interval
	Studies	Effect Sizes		
Performance improvement	9	34	1.07	.69-1.45
Journaling/behavior suggestion	8	17	.75	.49-1.00
Group discussion about feedback	16	29	.67	.39-.95

Effect Sizes for Self-Assessment of Learner Mastery

Practices	Number		Mean Effect Size (<i>d</i>)	95% Confidence Interval
	Studies	Effect Sizes		
Standards-based assessment	13	44	.76	.42-1.10
Self-assessment	16	29	.67	.39-.95

Cumulative Effects of the Adult Learning Characteristics



Additional Translational Synthesis Findings

- The smaller the number of persons participating in a training (<20), the larger the effect sizes for the study outcomes.
- The more hours of training over an extended number of sessions, the better the study outcomes.
- The practices are similarly effective when used in different settings with different types of learners.

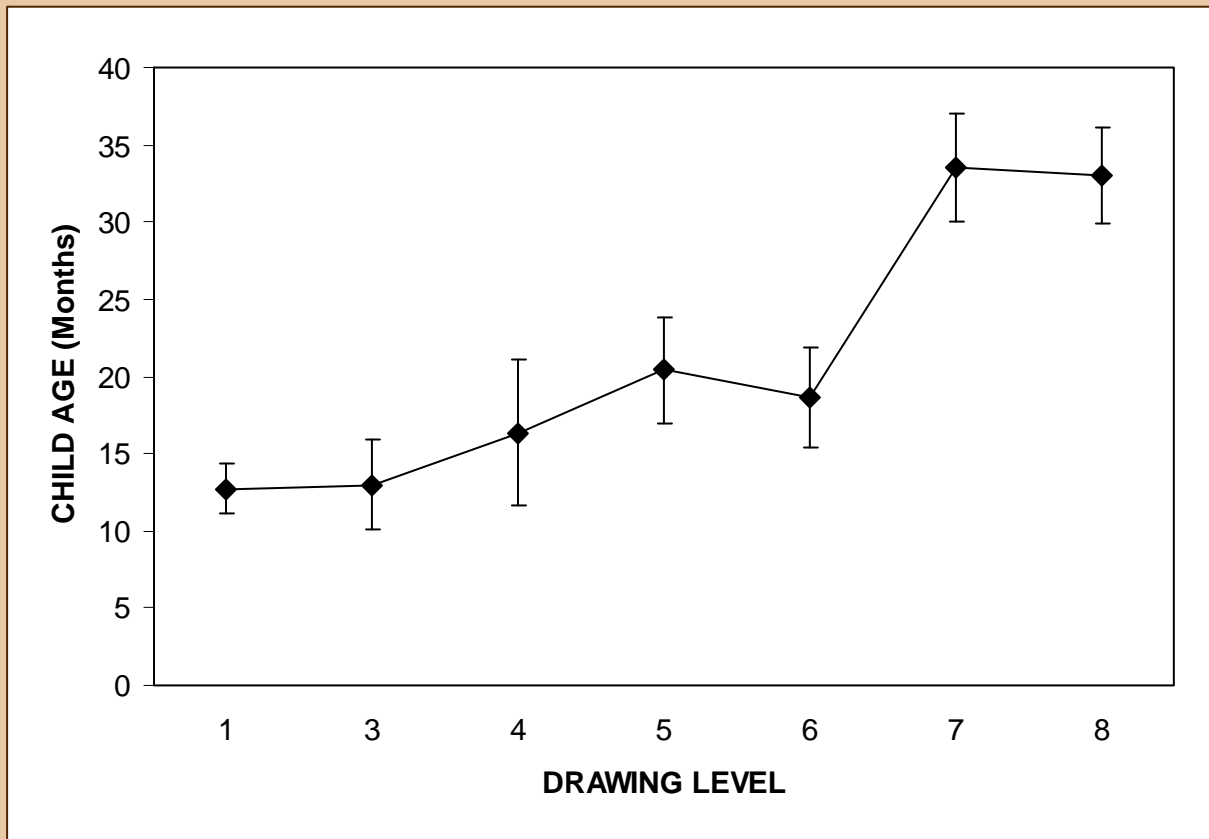
Infant and Toddler Mark Making and Scribbling Synthesis^a

- Research synthesis of 49 samples of infants and toddlers 9 to 42 months of age
- Mostly comparative conditions studies or developmental studies of the emergence of drawing behavior
- 1670+ infants and toddlers
- Focus of analysis was the age-related changes in drawing and the conditions under which drawing was optimized
- Cohen's *d* effect sizes were used as the metric for assessing the influences of different types of drawing activities on child behavior

^aDunst, C.J., & Gorman, E. (2009). Development of infant and toddler mark making and scribbling. *CELLreviews*, Vol.2., No.2.

Different Types of Mark Making, Scribbling, and Drawing

Type	Level	Description
Marks	1	Marks on a piece of paper or other writing surface
	2	Makes discernable dots
Scribbling	3	Random mark making without discernable form
	4	Random circular mark making
	5	Controlled mark making
Line Drawing	6	Controlled strokes and straight lines (vertical, horizontal, zig-zags, etc.)
	7	Geometric shapes (circles, squares, ovals, etc.)
Representational Drawing	8	Draws figures of objects or people with discernable features
	9	Invented drawing or spelling



Average ages (and standard deviations) for depicting the pattern of acquisition of different types of mark making, scribbling, and drawing

Experimental Conditions

- Type of drawing instrument (e.g., crayon vs. pencil)
- Type of drawing surface (e.g., flat vs. slanted)
- Type of visual prompt (e.g., blank page vs. picture as background)
- Type of activity (e.g., structured vs. unstructured)
- Type of child-adult interaction (e.g., collaborative vs. non-collaborative)
- Type of reinforcement (e.g., amount of visual effect)

Major Findings

- The larger the visual effect of drawing behavior, the more child drawing ($d > 2.00$)
- Drawing surfaces with backgrounds elicited more drawing than blank pages ($d = 1.81$)
- Crayons and magic markers proved to be the best drawing instruments ($d = 1.32$)
- Collaborative drawing engaged children in more drawing ($d > .90$)
- Backgrounds of people or faces elicited more drawing compared to pictures of inanimate objects ($d = .46$)
- Standard writing instruments were better than primary writing instruments ($d = .34$)
- Slanted writing surfaces made it easier for children to draw ($d = .34$)

Home Environment Synthesis^a

- Research synthesis of 28 samples of young children
- 3,358 children 8 to 66 months of age
- Mostly comparative conditions studies
- Focus of analysis was the person and environmental factors associated with different early literacy and language outcomes
- Correlations were used as the metric for assessing the influences of different types of home literacy environments activities on child behavior

^a Masiello, T. & Dunst, C.J. (in press). Characteristics of Literacy-Rich Home Environment and Pre-Literacy Development. *CELLreviews*, Vol.2., No.3.

Definitions of Home Environment Characteristics

Home Environment Characteristic	Definition
Literacy-Rich Experiences	Composite of home environment literacy experiences
Shared Reading	Episodes of the parent reading to the child, including measures of reading frequency, reading duration, and parents' reading style
Literacy Material Availability	The presence of books, magazines, or other literacy materials in the child's home
Child Engagement in Literacy	Child-initiated reading or writing activities, typically without an adult present
Child Interest in Literacy	Measures of the child's interest in reading and other literacy-related activities
Parent Interest in Literacy	Measures of parents' interest in reading; their beliefs and values about literacy, and their engagement in literacy outings such as trips to the library
Parental Instruction	Adult-mediated and direct instruction with the intention of helping the child learn to read or write
Parental Literacy-Related Interactions	Playing word or sound games with the child, or engaging the child in storytelling activities

Cohen's *d* Effect Sizes for Characteristics of Home Literacy Environment

Home Environment Characteristics	Early Literacy Outcomes		
	Number of Effect Sizes	Mean Effect Size	95% Confidence Interval
Literacy-Rich Experiences	53	.41	.39-.43
Child Interest in Literacy	28	.23	.20-.26
Literacy Material Availability	44	.23	.21-.25
Child Engagement in Literacy Activity	9	.22	.18-.26
Shared Reading	79	.19	.17-.20
Parental Instruction	21	.17	.14-.20
Literacy-Related Interactions	27	.15	.13-.18
Parent Interest in Literacy	45	.07	.06-.08

Shared Reading Synthesis^a

- Research synthesis of 25 samples of young children
- 1,150 children 8 to 42 months of age
- Mostly comparison conditions studies
- Focus of analysis was the characteristics of the reading experience associated with different language outcomes
- Cohen's *d*'s were used as the metric for assessing the influences of different types of reading characteristics on language behavior

^aTrivette, C. M. & Dunst, C. J. (in press). Shared Reading Characteristics Influence on Early Language Development. *CELLreviews*, Vol.2., No.4.

Definitions of Characteristics of Reading Interaction

Reading Interaction Characteristic	Definition
Attention	Gains the child's attention (e.g., "Look here")
Labels	Names an object, its properties or an ongoing action
Comment	Makes general talk that does not include labeling
Imitates	Repeats what the child says
Relates	Connects a picture or event in the book with the child's experience
Corrects	Uses corrective comments such as "No, it is a dog"
Positive Feedback	Uses praises or comments such as "That's right"
Wh- or Open Ended Questions	Evokes speech from the child which goes beyond yes/no answers
Expansions	Statements go beyond labeling or commenting, or statements expand on what the child is talking about
Follows-up with Questions	Follows up the child's comments or answers with a question
Follows Child's Interests	Follows the child's interest. For example, lets the child pick the book or "reads" the pages the child wants to read

Cohen's *d* Effect Sizes for Characteristics of Reading Interaction

Reading Interaction Characteristics	Language Development		
	Number of Effect Sizes	Mean Effect Size	95% Confidence Interval
Expansions	25	.76	.52-.99
Follows Child's Interests	18	.69	.47-.91
Open-Ended Questions	47	.65	.50-.79
Relates to Experience	11	.65	.21-1.08
Follows-up with Questions	13	.62	.24-.99
Positive Feedback	36	.61	.41-.81
Comments	28	.60	.37-.83
Imitates	21	.54	.37-.72
Corrects	23	.52	.25-.79
Labels	31	.41	.17-.64
Attention	18	.08	-.13 – .28

Conclusions

- A translational approach to conducting research syntheses yields more information about a practice (intervention, treatment, etc.) that can be used to develop evidence-based intervention or implementation practices.
- The yield from translational research syntheses can help practitioners know which characteristics of a practice ***matter most*** in terms of producing desired effects.
- Practitioners who use the practice characteristics that are associated with positive outcomes found in a translational synthesis are using evidence-based practices.

References

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