

Measuring Maternal Scaffolding Behaviour

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Sample

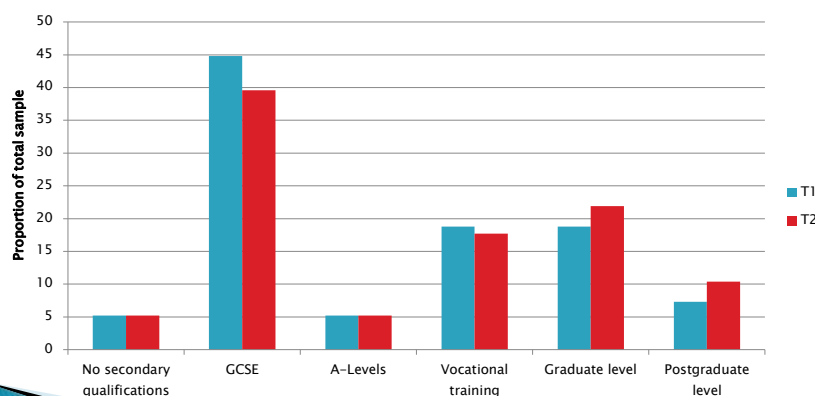
- ▶ 96 mother-child dyads from the Sisters & Brothers Study.
 - ▶ A longitudinal study of family relationships
- ▶ 49 boys and 47 girls with a mean age of 5.2 years ($SD = 0.61$) at T1 and 9.7 ($SD = 0.92$) at T2.
- ▶ 23% single-mother households.
- ▶ Mix of working- and middle-class backgrounds.

Procedure and measures

- ▶ Home visits conducted at both time points; including child assessments (T1), questionnaire completion (T1 & T2), and a scaffolding task (T2).
- ▶ Scaffolding (T2):
 - Block design task adapted from the WISC. Mother & child given a booklet with 4- and 9-block designs. Child asked to reproduce designs with blocks provided. Mother instructed to help as and when the child needed it.
 - Interaction was videotaped, and lasted 2–14 minutes.

Other Measures

- ▶ Verbal Mental Age (T1) – BPVS used.
- ▶ Maternal education via interview at T1&2:



Measures Cont'

- ▶ Parenting Questionnaire Measure (T1 & T2)
 - **Expression of Affection Inventory** (Hetherington & Clingempeel, 1992)
 - “Give each other a hug/kiss or other sign of physical affection.”
 - **Parent–Child Conflict** (Hetherington & Clingempeel, 1992)
 - How often they disagree about 11 items, e.g., bedtime, watching TV.
 - **Parental Discipline Interview** (Deater–Deckard, 2000)
 - Positive: “be firm and calm”; “explain to or reason”
 - Negative: “smack or slap”; “scream or shout”

The contingent shift

(Wood, Bruner & Ross 1975)

- ▶ Tutor alters specificity of instruction depending on performance of tutee.
- ▶ Tutor regulates tutees progress by initially controlling elements that are beyond current ability (high level of instruction) but gradually transfers responsibility as tutee’s knowledge/ability is extended (low level of instruction).

Determinants of Scaffolding

- ▶ Parental sensitivity (Meins, 1997; Mulvaney et al., 2006) and broader sociodemographic variables such as level of maternal education (Neitzel & Stright, 2004) are important determinants of maternal scaffolding quality.
- ▶ Parental sensitivity and level of education positively predict *contingent support*.

Determinants of scaffolding

- ▶ Other dimensions of parenting largely ignored.
 - Harsh parenting?
- ▶ We also examined *non*-contingent maternal behaviour as well as contingent shifting.
 - Fixed Failure Feedback

Carr, A., & Pike, A. (2012). Maternal Scaffolding Behavior: Links With Parenting Style and Maternal Education. *Developmental Psychology*, 48(2), 543-551.

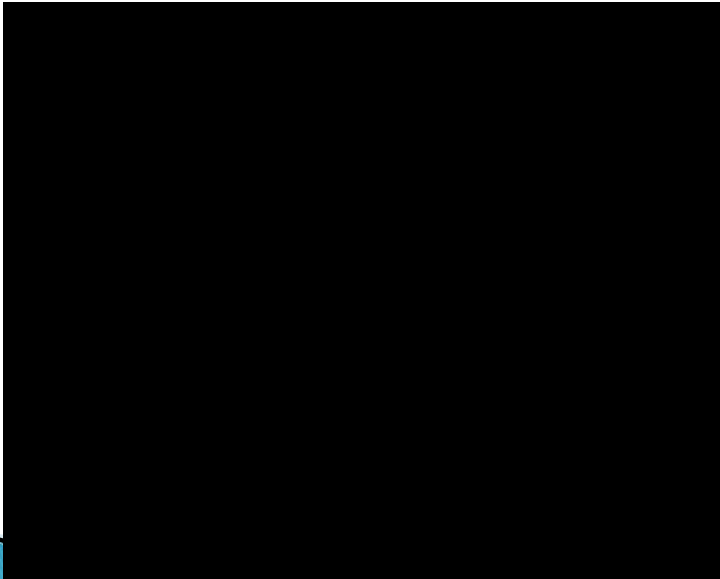
Measuring scaffolding

- ▶ Each action by the child was coded as correct or incorrect.
- ▶ Each subsequent intervention made by the mother was coded for level of specificity.

Level	Description	Example
0	Simple feedback: Short, simple feedback on child's action indicating correct or incorrect moves.	"Good." "No."
1	Orienting suggestions: Focusing strategies, general rules, and comments.	"This one uses nine blocks."
2	Suggestions: Suggestions about specific blocks, locations, or actions but not combinations of the three.	"You need a half one there."
3	Solutions: Suggestions and strategies indicating which block sides should be used and where to put them.	"It's a solid block in the middle and white round the edge."
4	Physical help: Physical intervention that aids the child in completing a section of the task.	Pointing at blocks, selecting the correct block for the child with or without verbal explanation (e.g., "This bit needs a half block, like this").
5	Demonstration: The mother performs the task herself while the child observes.	Mother provides complete demonstration with or without verbal explanation (e.g., "This one goes like that, then this one turns around and goes in the corner").

Adapted from Meins (1997) and Wood & Middleton (1975);

Family 112



Intervention	Mother - level of specificity						Child Progress		
	0	1	2	3	4	5	Yes	No	Help
White corner					x		x		
Red corner					x			-----	
Take that one out and put this one there						x		-----	
Ok next one, solid white					x		x		
Next line down, you've got a white corner pointing downwards						x		-----	
Next one,...might be.., what do you think?					x			-----	x
No, I'm not sure, I don't think it is.		x						-----	
Might be a, might be a						x	x		
Oh no, its an arrow look isn't it, its a tick.					x			-----	
So the next one over is a solid white, at this end the middle end here					x		x		
Yeah, that right so see you've got a solid line					x		x		
Yeah, And a red corner goes there					x		x		
									End

Measuring scaffolding

- ▶ 17% of interactions were double coded
 - Levels of intervention: $\kappa = .85$
 - Task performance: $\kappa = .87$

Maternal Scaffolding

- ▶ Contingent Shifting
 - After success → Intervention is at the same or at a lower level to the previous intervention .
 - After unsuccessful action → Intervention is one or two levels higher to the previous intervention.
- ▶ Fixed Failure Feedback
 - Same level of intervention is repeated after an unsuccessful action.
- ▶ Calculated as proportion of total interventions

Intervention	Mother - level of specificity					Child Progress			
	0	1	2	3	4	5	Yes	No	Help
White corner					x	x			
Red corner					x			-----	
Take that one out and put this one there						x		-----	
Ok next one, solid white					x		x		
Next line down, you've got a white corner pointing downwards						x		-----	
Next one,...might be..., what do you think?					x			-----	x
No, I'm not sure, I don't think it is.	x							-----	
Might be a, might be a						x	x		
Oh no, its an arrow look isn't it, its a tick.					x			-----	
So the next one over is a solid white, at this end the middle end here					x		x		
Yeah, that right so see you've got a solid line					x		x		
Yeah. And a red corner goes there					x		x		
									End

Parenting & Scaffolding

	Harsh Parenting (T1)	Positive Parenting (T1)	Harsh Parenting (T2)	Positive Parenting (T2)
Contingent Shifting	-.15	-.08	-.28**	.30**
Fixed Failure Feedback	.37***	.09	.44***	-.09

Does Parenting Predict Scaffolding over & above Maternal Education?

Contingent Shifting			
	Step 1	Step 2	Step 3
Verbal Mental Age	.26**	.21*	.23*
Maternal Education		.29**	.19
Harsh Parenting			-.24*
Positive Parenting			.24*

Does Parenting Predict Scaffolding over & above Maternal Education?

Fixed Failure Feedback			
	Step 1	Step 2	Step 3
Verbal Mental Age	-.08	-.04	-.10
Maternal Education		-.20	-.09
Harsh Parenting			.43***

Summary/Discussion

- ▶ Beyond replicating that positive parenting is related to scaffolding, harsh parenting predicts BOTH contingent AND non-contingent scaffolding practices.
- ▶ Maternal education is indicative of wider social and economic influences on family life, including parenting and academic attainment.
- ▶ Our findings suggest that parenting partially mediates the inter-generational transmission of academic attainment.

Carr, A., & Pike, A. (2012). Maternal Scaffolding Behavior: Links With Parenting Style and Maternal Education. *Developmental Psychology*, 48(2), 543-551.

Georgia's dataset

- ▶ 78 dyads (54% boys)
- ▶ Exclusion criteria: if mother explicitly states she cannot do it, or needs help
- ▶ Coded designs 4-10 (1-3 treated as practice)

Wertsch's transition of regulation

Wertsch hypothesised about processes underlying effective tutoring (scaffolding)...

- ▶ Tutor supports child by helping them learn self-regulation (e.g. error-checking, attention)
- ▶ Tutor models self-regulation, and delivers *other*-regulation
- ▶ Tutor regulates less as child improves self-regulatory techniques

Wertsch's transition of regulation

REQUIRES:

- ▶ Sensitivity (more other-regulation if needed)
- ▶ Fading (tutor other-regulates less over time)
- ▶ Effort from both child and tutor

So scaffolding requires both tutor and learner to adjust their regulation in line with the other

(Wertsch et al., 1980)

Why I used this concept

- ▶ Looks at both mother's behaviour and child's behaviour *relatively* distinctly
 - How predictor variables affect individuals *and* dyad
- ▶ Can explore which regulatory behaviours transfer easier/smoothly than others

My coding scheme

- ▶ Adapted self- and other-regulation coding scheme
 - Parent other-regulation
 - Child self-regulation
- ▶ Based on manifestations of regulatory behaviour (equivalents for parent and child)

Coding for regulation

Parent's other-regulation

Planning
Joint attention
Behaviour regulation
Evaluation

Scale: 1-4 (1 = low OR)

Child's self-regulation

Planning
Joint attention
Behaviour regulation
Attention
Motivation
Evaluation

Scale: 1-4 (1 = high SR)

NB Constructs yielded from principal components analysis

- ▶ For each design, watched through and coded what we'd seen
- ▶ Also calculated *difference scores* for each design
 - total of parent other-regulation
 - total of child self-regulation
 - (labelled this *regulation alignment*)

Example coding

Sample family, sample design

Parent total other-regulation = 3

Child total self-regulation = 1

Regulatory alignment = 2

So could then create means of self-regulation, other-regulation and alignment for all designs, or look at change over time

Reliability

- ▶ Two coders, double-coded 20% of videos
- ▶ 94% perfect or close agreement
- ▶ Average correlation of .921 (transformed with Fisher's Z), ranging from .706 to .991

Results

Mother other-regulation was relatively low

Children generally good self-regulators

Alignment was generally high – however, there was a large range

Alignment correlated with child's self-regulation (+ve) and with mother's other-regulation (-ve)

Regulatory Alignment correlates

- ▶ Parent-child relationship
 - Warmth positively correlated with alignment
 - Conflict n.s.
- ▶ Child temperament
 - Activity levels negatively correlated with alignment
 - All other temperaments n.s.
- ▶ Mother temperament
 - Emotional anger n.s.

Correlations with Time 1 variables

- Parent-child relationship (warmth, conflict)
- Child temperament
- Mother temperament

	Affection	Child's 'Activity'
Child SR	.318*	-.233*
Mother OR	-.398*	.312*
Alignment	.369*	-.307*

Correlations with Amanda's coding

Regulation coding	Scaffolding coding	
	Contingency	Fixed failure feedback
<u>Parent other-regulation</u>	-.467**	.366**
<u>Child self-regulation</u>	.533**	-.372**
<u>Dyadic alignment</u>	.519**	-.423**

Notable differences

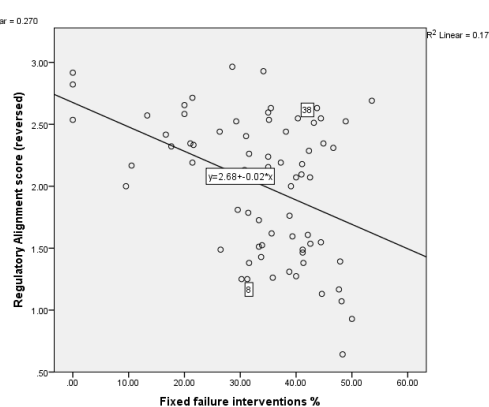
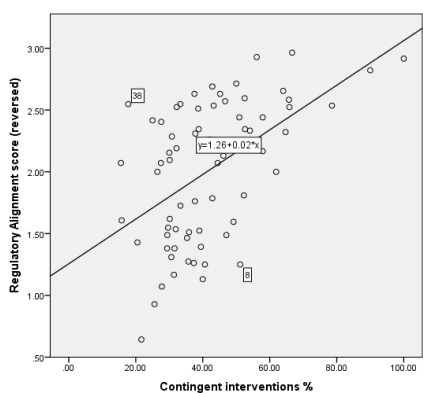
Scaffolding coding

- ▶ Fine-grained
 - (intervention-level)
- ▶ Separate coding for 'good' & 'bad' scaffolding

Regulation coding

- ▶ More general, global
 - (design-level)
- ▶ Single scale for 'high' and 'low' alignment

Scatterplots for exploration



Case 8 (Family 112)

OVERALL

- ▶ Mid-range on both contingency and fixed failure feedback scores
- ▶ Low regulatory alignment scores

EXAMPLE

- ▶ Design 9
- ▶ Alignment scores
- ▶ Mother-other-regulation

Case 8 (Family 112)

Parent's other-regulatory strategies	
Exploration of means and planning	
3	occasionally get physically involved in the task or gives explicit directions
Joint attention / communication	
4	very regularly initiates joint attention / initiates throughout interaction
Behaviour regulation / inhibition / involvement	
4	initiates unnecessary help (overinvolved)
Evaluation (towards end of task)	
1	invites or supports the child's self-evaluation

Mean = 3 (1 = low other-regulation, 4 = high)

Case 8 (Family 112)

Child's self-regulatory strategies	
Exploration of means and planning	
4	execution of actions indicated by the adult, no spontaneous activity
Joint attention / communication	
1	regularly initiates or responds to joint attention (or does not need to)
Behaviour regulation / inhibition / involvement	
1	only expresses requests rarely and when absolutely necessary (controls the task)
Attention	
1	manages his/her attention (no lapse of concentration)
Motivation	
1	regularly expresses pleasure or self-reinforces or maintains his/her motivation
Evaluation	
1	identifies his/her possible errors and adjusts or corrects them

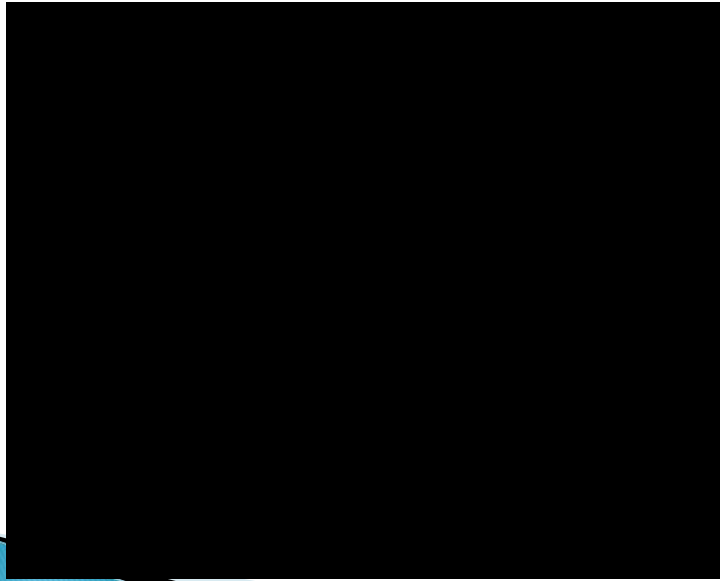
Mean = 1.5 (1 = high self-regulation, 4 = low)

Alignment = $(3 - 1.5) = 1.5$

Case 8 – Contingency and FFF

- ▶ Design 9
 - Contingent shifting – 45%
 - Fixed Failure Feedback – 9%
- ▶ Whole interaction
 - Contingent shifting = 52.16%
 - Fixed Failure Feedback = 30.23%
- ▶ Means (SDs) for whole sample
 - Contingent shifting – 39.19% (16.96)
 - Fixed Failure Feedback – 34.28 % (12.63)

Family 224



Case 38 (Family 224)

OVERALL

- ▶ Low on contingency (17.74%) and high on fixed failure feedback (40.32%).
- ▶ Relatively high regulatory alignment

EXAMPLE

- ▶ Design 9

Case 38 (Family 224)

Parent's other-regulatory strategies	
Exploration of means and planning	
1	looks to or listens to the child or questions him or her about problem solving
Joint attention / communication	
1	responds to joint attention and does not initiate
Behaviour regulation / inhibition / involvement	
1	helps or approves exclusively if necessary
Evaluation (towards end of task)	
1	invites or supports the child's self-evaluation

Mean = 1 (1 = low other-regulation, 4 = high)

Case 38 (Family 224)

Child's self-regulatory strategies	
Exploration of means and planning	
1	Planning, anticipation of means displayed
Joint attention / communication	
1	regularly initiates or responds to joint attention (or does not need to)
Behaviour regulation / inhibition / involvement	
1	only expresses requests rarely and when absolutely necessary (controls the task)
Attention	
1	manages his/her attention (no lapse of concentration)
Motivation	
1	regularly expresses pleasure or self-reinforces or maintains his/her motivation
Evaluation	
1	identifies his/her possible errors and adjusts or corrects them

Mean = 1 (1 = high self-regulation, 4 = low)

Alignment = (1 - 1) = 0