

A new measure of parents' lay theories of parenting and child development

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Abstract

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Child development research is constantly generating information that can be brought to bear on best-practices for parenting. For example, research on children's learning has demonstrated that pedagogy can improve learning in some contexts and limit it in others, suggesting that allowing children to play freely and explore is critical for learning (Bonawitz et al., 2011; Buchsbaum, Gopnik, Griffiths, & Shafto, 2011). Likewise, a great deal of research has demonstrated the importance of engaging young children in elaborative conversations for language development and future academic success (Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). A fundamental challenge we face is how to communicate the results of such scientific inquiry to a diverse public in a way that maximizes uptake and improves people's daily and long-term decision making.

One critical parameter that may mediate parenting behavior is parents' implicit lay theories about child development and parenting. Lay theories reflect the core beliefs that people hold in different domains, which may or may not be explicitly articulated, but organize the processing of new information and decision-making (Dweck & Legget, 1988; Ong, Zaki, & Goodman, 2015). For example, people with an entity theory of personality tend to interpret people's behaviors as stemming from fixed personality traits rather than situational factors such as needs, goals, or emotional states (Dweck, Chiu, & Hong, 1995). There are two reasons to focus on parents' lay theories. First, parents' lay theories might be an important explanatory factor for many of the behaviors parents engage in with their child. For example, a parent who believes that building a strong emotional bond with their baby is one of the most important goals of parenting might have more physical contact with their child than a parent who does not hold this theory. Secondly, parents' lay theories may moderate the uptake of new information about parenting. It is well-established that people more easily encode new information that is consistent with an existing schema or mental model they hold (Bransford & Johnson, 1972). In addition, previous research has found that interventions on public health beliefs are more successful when they take into account people's existing belief structures in the domain (Kumar et al. 2015).

There is some evidence supporting the notion that parents' behaviors are mediated by implicit lay theories about child development, which vary by SES and across cultures. For

example, cross-cultural studies have found profound differences in how parents interact with infants; Richman, Miller & LeVine (1992) found that mothers in the Gusii community of Kenya primarily engaged with their children to soothe them when upset, but did not often speak to them with the goal of engaging or stimulating them, as did Caucasian parents in the United States. The authors attribute this to cultural conventions stemming from the belief that there is no purpose in speaking to infants as they will not understand what is being said (Richman, Miller & LeVine, 1992; LeVine, 2004).

There are also important differences in how parents within western cultures interact with their children. Numerous studies have identified SES disparities in the amount that parents talk to their children, which predicts children's language and academic outcomes (Hoff, 2003; Huttenlocher et al. 2002). In an effort to identify the source of this disparity, Rowe (2008) discovered that parents' knowledge of child development (as indexed by their scores on the Knowledge of Infant Development Inventory; KIDI) predicted their child-directed language, with more knowledgeable parents speaking to their children more even when controlling for the amount of speech directed at another adult. Although this study examined parents' knowledge, and not their lay theories per se, it provides evidence that people's domain knowledge has real consequences for their interactions with their children.

There are other examples of parenting beliefs on which parents differ; Lareau's (2003) theory of "concerned cultivation" suggests that higher SES parents are more likely to view their child's development as a project that requires a great deal of coordination in the form of activities and learning experiences, while lower SES parents are more likely to view their job as keeping their children safe from harm, with the assumption that they will naturally thrive if given independence. There have also been hundreds of studies based on Baumrind's (1971) framework that identifies parents as authoritative, authoritarian, or permissive, based on their levels of responsiveness and control in their interactions with their children. Thus, parents' approaches to parenting appear to vary in predictable ways based on their knowledge and perceptions about children's learning and development.

Although these previous studies provide preliminary evidence that parents' beliefs about parenting and child development affect their parenting behaviors, no previous research has attempted to identify the underlying theories that might organize their behavior and decision-making. Previous research has generally relied on observation of parent-child interactions or self-report of specific activities and behaviors. To our knowledge there is not an existing measure of par-

ents' more general attitudes about parenting and child development, which might drive behavior and predict the uptake of interventions. To address this gap, the present work establishes a self-report scale that captures adults' lay theories about child development and parenting. We generated a questionnaire measuring the degree to which parents endorse three potential lay theories: a "rules and respect" theory, an "affection and attachment" theory, and an "early learning" theory. As an initial test of the external validity of the questionnaire, we conducted an experiment to investigate whether parents' scores on the theory subscales would differentially predict their uptake of parenting information presented via a popular press article about children's early learning from free play (Gopnik, 2011). We found that higher scores on the "early learning" subscale, but not the "rules and respect" subscale, predicted recall and generalization from the target article (about free play) but not a control article that was unrelated to child development. Thus, parents' lay theories about parenting and child development as measured by our questionnaire may be a meaningful factor in parents' behavior and information uptake.

Scale Construction

In order to establish a new measure of parenting attitudes, we followed a structured plan based on psychometric best practices (Clark & Watson, 1995; Furr, 2010; Simms, 2008). We generated items corresponding to three hypothesized latent theories about parenting: the Early Learning theory corresponds to a view of children's early learning that is consistent with contemporary child development research, and includes the idea that young children can teach themselves by exploring and playing. The Affection and Attachment theory captures the notion that close parent-child relationships are important for development, and includes the ideas that parents should talk to their children about their emotions and that children are not spoiled by too much affection. The Rules and Respect theory corresponds to the idea that parents' primary role is to enforce rules and encourage behavior control. We generated items based on a review of the literature on parenting attitudes, and conducted psychometric analyses on iterative samples of respondents.

In an initial phase of scale construction, we generated 42 statements that described attitudes consistent with one of three potential implicit theories about parenting: Active Learning (12 items; e.g., "Children can learn about things like good and bad behavior from an early age"), Affection and Attachment (10 items; e.g., "It's important for a baby to have a strong bond with mom"), and Rules and Respect (20 items; e.g., "It is very important that children learn to respect adults, such as parents and teachers"). These statements were generated based on a literature review of parenting attitudes and behaviors. The Affection and Attachment and Rules and Respect subscales are related theoretically to the Authoritative and Authoritarian dimensions of Baumrind's (1971) parenting framework, as well as theories of attachment parenting

(Jones, Cassidy, & Shaver, 2015), but aim to assess beliefs about parenting rather than overt behaviors. The Early Learning subscale aimed to assess the extent to which adults believe that it is important to help infants and toddlers learn through play and conversation.

The initial 42-item scale was administered to 250 adults on Amazon's Mechanical Turk. Participants used a 7-point Likert scale to report the degree to which they agreed with each statement from 0 (Do not Agree) to 6 (Strongly Agree). Chronbach's alphas for the three subscales were .86 (Active Learning), .81 (Affection and Attachment), and .74 (Rules and Respect). We then conducted Exploratory Factor Analysis (EFA) to assess the dimensionality of the scale. Based on a parallel analysis (Horn, 1965) we retained 5 factors in this initial model. We subsequently dropped any items that had factor loadings less than .40 on the relevant factor, as well as any items that had factor loadings greater than .40 onto another factor. Items were also dropped if analyses revealed that Chronbach's alpha would be increased by dropping the item. Additional items were dropped such that there were 6 items in each subscale. Some items were re-worded such that half of the items in each subscale were negatively worded to avoid response sets (Simms, 2008).

The revised questionnaire was administered to a second group of 250 adults on Amazon's Mechanical Turk. For this sample, Chronbach's alphas were .76 (Active Learning), .75 (Affection and Attachment), and .69 (Rules and Respect). Because analysis of the previous sample identified 5 factors instead of the hypothesized 3, we again conducted EFA. This time, the parallel analysis identified 3 factors as predicted. The subscale items were roughly grouped according to a priori subscales, although some items from the Affection and Attachment subscale load onto both the Affection and Attachment and Active Learning subscale factors.

Experiment 1

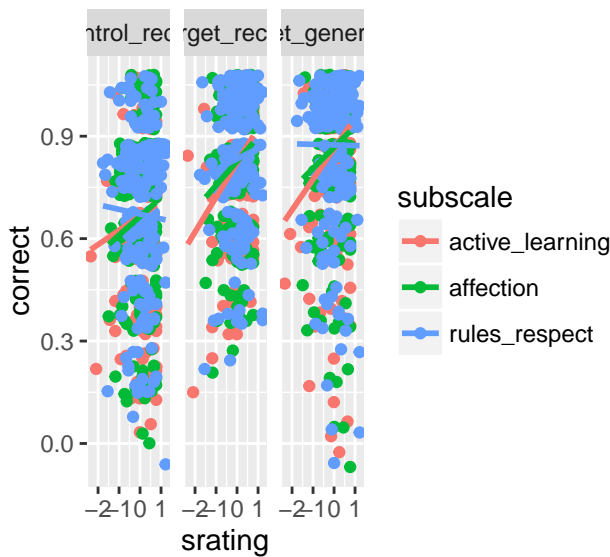
We next conducted an experiment to test whether scores on the three subscales would predict people's uptake of new information, as an initial test of the external validity of the scales. For this purpose, we had participants read two popular press articles: an article arguing that free play is beneficial to children's learning (Gopnik, 2011), and an article about the language of smell (Yong, 2015). We operationalized uptake as accurate recall and generalization of the central message of the target article, and recall of the control article. We predicted that if people's subscale scores reflect coherent lay theories, they should differentially moderate uptake of the two articles. Specifically, we predicted that scores on the Early Learning subscale would be positively related to recall and generalization of the target article, but not recall of the control article. We predicted that scores on the Rules and Respect subscale would not predict uptake of either article. We excluded scores on the Affection and Attachment subscale from our analyses, since they are not orthogonal to scores on the Early Learning subscale.

Methods

Participants Participants were 250 adults recruited from Amazon's Mechanical Turk. Of these participants, 122 reported having children, 123 reported having no children, and 5 did not indicate whether or not they had children.

Procedure Participants first completed the 18-item parenting questionnaire described above. Participants were then instructed to read two popular press articles at their own pace. They first read a target article about children's early learning ("Why Preschool Shouldn't Be Like School", Alison Gopnick, Slate, 2011), and then read a control article about the language of smell ("Why Do Most Languages Have So Few Words For Smells?", Ed Yong, The Atlantic, 2015). After reading both articles, they first answered 5 3afc recall questions about the control article, and then answered 5 3afc generalization and 5 3afc recall questions about the target article. The recall questions assessed participants' memory for specific details of the text, and the generalization questions assessed participants' ability to generalize from the meaning of the text to new situations (Fig ##) **put examples of questions in a table?

[1] 48



```
\begin{CodeChunk} \begin{CodeOutput} Generalized
linear mixed model fit by maximum likelihood (Laplace Ap-
proximation) [glmerMod] Family: binomial ( logit ) Formula:
correct ~ question_type * rules_respect + question_type * ac-
tive_learning +
(1 | workerid) + (1 | q_num) Data: filter(d.reg, !workerid
%in% exclude)
```

```
AIC      BIC      logLik deviance df.resid
39100.8 39198.8 -19539.4 39078.8 54529
Scaled residuals: Min 1Q Median 3Q Max -6.3483 0.0554
0.2232 0.4042 8.7323
Random effects: Groups Name Variance Std.Dev. work-
erid (Intercept) 2.7895 1.6702
```

```
q_num (Intercept) 0.6011 0.7753
Number of obs: 54540, groups: workerid, 202; q_num, 15
Fixed effects: Estimate Std. Error z value (Intercept)
1.11009 0.36004 3.083 question_typedtarget_generalize
1.56790 0.48045 3.263 question_typedtarget_recall
1.27814 0.48109 2.657 rules_respect -0.10182
0.21071 -0.483 active_learning 0.27433 0.22355
1.227 question_typedtarget_generalize:rules_respect
-0.05937 0.06306 -0.942 ques-
tion_typedtarget_recall:rules_respect 0.32354 0.05755 5.622
question_typedtarget_generalize:active_learning 0.61527
0.05663 10.864 question_typedtarget_recall:active_learning
0.48608 0.05420 8.968 Pr(>|z|)
(Intercept) 0.00205 ** question_typedtarget_generalize
0.00110 ** question_typedtarget_recall 0.00789 **
rules_respect 0.62895
active_learning 0.21978
question_typedtarget_generalize:rules_respect 0.34643
question_typedtarget_recall:rules_respect 1.88e-08 ques-
tion_typedtarget_generalize:active_learning < 2e-16 ques-
tion_typedtarget_recall:active_learning < 2e-16 *** — Signif.
codes: 0 ‘‘0.001’’ 0.01 ‘‘0.05’’ 0.1 ‘‘1’’
```

```
Correlation of Fixed Effects: (Intr) qstn_typedtrgt_g
qstn_typedtrgt_r rls_rs actv_l qstn_typedtrgt_g -0.655
qstn_typedtrgt_r -0.657 0.487
rules_rspct -0.001 0.002 0.000
activ_lrnng -0.067 0.003 0.000 -0.254
qstn_typedtrgt_gnrlz:r_ 0.001 -0.003 -0.001 -0.088 0.025
qstn_typedtrgt_rcll:r_ 0.002 -0.001 0.000 -0.099 0.028
qstn_typedtrgt_gnrlz:c_ 0.005 0.001 -0.002 0.029 -0.093
qstn_typedtrgt_rcll:c_ 0.005 -0.003 -0.003 0.032 -0.099
qstn_typedtrgt_gnrlz:r_ qstn_typedtrgt_rcll:r_ qstn_typedtrgt_g
qstn_typedtrgt_r
rules_rspct
activ_lrnng
qstn_typedtrgt_gnrlz:r_
qstn_typedtrgt_rcll:r_ 0.401
qstn_typedtrgt_gnrlz:c_ -0.386 -0.141
qstn_typedtrgt_rcll:c_ -0.133 -0.335
qstn_typedtrgt_gnrlz:c_ qstn_typedtrgt_g
qstn_typedtrgt_r
rules_rspct
activ_lrnng
qstn_typedtrgt_gnrlz:r_
qstn_typedtrgt_rcll:r_
qstn_typedtrgt_gnrlz:c_
qstn_typedtrgt_rcll:c_ 0.446
\end{CodeOutput} \end{CodeChunk}
```

Results

We excluded 48 participants who spent less than 30 seconds reading one or both of the articles, based on the assumption that they had not had time to read the whole article. Mean accuracy for the remaining sample was .67 (SD = .24) for control recall, .83 (SD = .19) for target recall, and .87 (SD = .22) for target generalization. As we were interested in whether

subscale scores would differentially predict uptake of the target article compared to the control article, we conducted a mixed-effects regression with standardized Early Learning and Rules and Respect subscale scores, as well as interaction terms for the subscale scores by question type (i.e., control recall vs. target recall vs. target generalization) as fixed effects, and participants and questions as random effects. There was a significant interaction of subscale score with question type, such that Early Learning scores positively predicted target recall and target generalization, whereas Rules and Respect scores predicted target recall but not target generalization (Table ##).

Discussion

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References