Proof of concept for a brief online intervention for enhancing parental reflective functioning

By

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To my mom, Beatriz Quintanilla,

who has encouraged me to pursue a career that challenges and excites me

and

To my advisors, Kathryn Humphreys and Autumn Kujawa,

who have supported me throughout my graduate work

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INTRODUCTION

Mentalizing refers to the process by which one makes inferences about the mental states of others (Luyten & Fonagy, 2015). Perhaps no context exhibits the importance of mentalizing more than in caring for young children, as young children have not yet developed a full understanding of and ability to communicate their thoughts and feelings. A body of research has investigated mentalizing in the parenting context, with a focus on parental reflective functioning, which is a parent's capacity to hold their child's mental states and intentions in mind (Slade, 2007). Research suggests parental reflective functioning allows parents to attune to the needs of their child and facilitates appropriate behavioral responses to the child's cues (Krink, Muehlhan, Luyten, Romer, & Ramsauer, 2018). As a result, responsive and attuned caregiving promotes healthy social, emotional, and physical development for a child (Ordway, Sadler, Dixon, & Slade, 2014).

The role of parental reflective functioning in parents' abilities to relate to their child's internal states differs across caregivers (Hughes, Aldercotte, & Foley, 2017), depending on a range of factors including depressive symptoms. For example, some research indicates that parents with depression show increased self-focus with their own internal state, and consequently, less attunement with their child's internal states (Ernst & McMahon, 2004). This suggests depressed caregivers, compared with non-depressed caregivers, exhibit lower parental reflective functioning (Fischer-Kern et al., 2013).

Perhaps as a result of lower parental reflective functioning, mothers experiencing depression report significantly lower maternal insightfulness or the capacity to see things from their child's perspective (Ramsauer et al., 2014). Taken together, this evidence supports interventions targeting parental reflective functioning. Especially as these interventions may improve the caregiving received by children of parents with elevated depressive symptoms (Schacht et al., 2017).

Research indicates that mentalizing-based interventions are effective in improving parents' ability to mentalize about their children as well as the quality of caregiving (Camoirano, 2017). A recent study used one session to enhance the extent to which caregivers hospitalized for severe mental illness were able to interpret their child's behavior (Schacht et al., 2017). Mothers were filmed interacting with their infants and were provided tailored, individual video feedback. The treatment focused on increasing appropriate mind-related comments and decreasing non-attuned mind-related comments. Infants whose mothers participated in the treatment were more likely to be securely attached to their mothers at approximately 15 months of age in comparison to a control group. The brief nature of the Schacht et al. (2017) intervention makes the development of a short intervention promising for promoting parental reflective functioning in caregivers. However, providing tailored feedback to families is labor and time-intensive for clinicians. This raises the question of whether an online program could be developed to enhance parental reflective functioning without the need for a trained clinician. Online interventions are inexpensive to disseminate and have the potential to reach more caregivers. The current proof of concept study aimed to provide a preliminary test of modifiability of parental reflective functioning using a brief intervention administered online (e.g., via Amazon's Mechanical Turk platform). Prior evidence suggests that data collected from this platform is generally consistent with data collected in person and provides a feasible method for proof of concept testing (Coppock, 2019).

For the current study, we recruited parents with a child between ages 18-36 months. Parents were randomly assigned to one of three intervention conditions and received instructions prior to viewing photographs of young children completing a variety of actions, specifically: (a) asking parents to reflect on *why* the child in the picture was doing what they were doing (i.e., why condition), (b) asking parents to reflect on *how* the child was doing what they were doing (i.e., how condition), and (c) asking parents to look at the photo (i.e., look condition). This approach mirrors an action identification paradigm developed by Spunt et al.

(2011) to investigate the neural bases of mentalizing observed actions. These three conditions are based on action identification theory, which posits that the same action can be identified in several ways (Vallacher & Wegner, 1987). In using action identification theory, researchers assume higher levels of identification focus on the mental states that explain an action (i.e., why an action is being performed: mental state reflection/mentalizing) while lower levels refer to the observable motor action (i.e., how an action is performed: physical state reflection/mechanizing). Parents then completed a questionnaire that assessed how much they mentalized or mechanized about their child's behavior, as well as a questionnaire assessing current depressive symptoms.

Aim 1: Does an intervention prompting reflection about other young children's actions result in greater parental reflective functioning about one's own child? Prior research indicates that a parent's parental reflective functioning is associated with greater mentalizing about their child's internal state (Rosenblum, McDonough, Sameroff, & Muzik, 2008). Further, there is some evidence that a parent's ability to mentalize about their young child is modifiable (Schacht et al., 2017). In the current study, we examined whether instructions to consider the actions of children (i.e., reflect on either why or how a young child in a photograph completes an action) vs. a control condition in which parents were instructed to only look at a photograph of children's actions affected mental state reflection regarding their own child. We hypothesized that encouraging directed thinking (e.g., why or how) about children's actions on the part of parents would lead to more mental state reflection about their own child than asking parents to only look at photographs of children's actions.

Aim 2: Does the type of directed reflection about young children's actions used in the intervention affect parents' parental reflective functioning about their own child? Prior work suggests that mechanizing vs. mentalizing results in different brain network activation (Spunt & Adolphs, 2014). The same action can be conceptually represented as either the concrete mechanics (i.e., mechanizing) or as abstract mental states that may explain an action

(i.e., mentalizing) (Vallacher & Wegner, 1987). We examined whether instructions to mentalize about children's actions (i.e., reflect on why children in photographs complete actions) vs. mechanizing (i.e., reflect on how children in photographs complete actions) vs. the control condition affect parents' parental reflective functioning regarding their own child. Thus, this research would suggest that parents asked to reflect on why children complete actions would report more parental reflective functioning about their own child, followed by parents asked to reflect on how children complete an action. We expected that parents asked to look at photographs of children's actions would report the least parental reflective functioning.

Aim 3: Do depressive symptoms moderate the effects of an intervention prompting reflection about other young children's actions on parent's parental reflective functioning about their own child? Last, we tested if depressive symptoms moderated the degree in which the intervention condition impacted mental state reflection. Parents high in depressive symptoms may show weaker or stronger effects of condition on mental state reflection. From one perspective, there is evidence that individuals with more strengths (e.g., married, high socioeconomic background, fewer depressive symptoms) benefit most from interventions (Bert, Farris, & Borkowski, 2008; Driessen & Hollon, 2010). Consistent with this, previous research found that parents with lower risk profiles (e.g., lower internalizing symptoms, fewer challenging life circumstances), when compared to parents at higher risk profiles, showed more gains in a technology-assisted parenting intervention (Bert et al., 2008; Hall & Bierman, 2015). Yet, there is also the possibility that parents with more depressive symptoms possess a greater capacity for growth (Stjerneklar, Hougaard, & Thastum, 2019). Consistent with this possibility, previous research on caregiver's mentalization has found associations between less mental state reflection and greater depressive symptoms (Ernst & McMahon, 2004). There is also evidence that brief interventions, such as directing caregivers to think about what young children in a video clip may be thinking, wanting, feeling or experiencing, can enhance mentalizing in caregivers with mood disorders (Schacht et al., 2017). In the current study, we expected a main

effect of depression, such that greater depressive symptoms would be associated with lower parental reflective functioning. We also explored whether depressive symptoms would moderate the effect of condition on parental reflective functioning. As indicated based on the research cited above, one possibility is that depressive symptoms could reduce the effects of the active conditions (i.e., why or how) on parental reflective functioning. Alternatively, parents with greater depressive symptoms may show stronger effects of the active condition on parental reflective functioning because these parents possess more potential for improvement and/or need for intervention.

METHODS

Participants

Parents with at least one child participated in this study. Eligibility for participating required participants to be fluent in English, between ages 18 and 45, currently raising a child between 18 and 36 months, and residing in the US. A total of 501 parents completed the study. There has been increasing information about invalid data on Mechanical Turk (Moss & Litman, 2018). We used two strategies to eliminate these responses. First, we included a check question where participants were asked to remember the color green at the beginning of the survey and report this information back at the end of the survey. Responses of participants that provided incorrect answers were removed. Second, we removed responses with exact matches and repeats for IP address or geolocation (latitude and longitude). These screening strategies provide effective means to identify and eliminate invalid responses (Kennedy, Clifford, Burleigh, Jewell, & Waggoner, 2018; Moss & Litman, 2018). The use of these strategies reduced the number of participants by 89%. A total of 115 parents remained after implementation of the screening strategies.

The age of participants ranged from 24 to 45 years (*M*=33.70, *SD*=5.33). Mothers represented 56% (n=64) of participants. For all participants, 76% (n=88) identified as White, 11% (n=13) identified as Black or African American, 8% (n=9) identified as Asian, 3% (n=3)

identified as American Indian or Native Alaskan, 1% (n=1) identified as Native Hawaiian or Other Pacific Islander, and 1% (n=1) preferred not to answer. Six percent (n=7) of the sample identified as Hispanic. Sixty-three percent of the sample (n=72) reported their highest educational attainment as a bachelor's degree or higher, 14% (n=16) as an associate's degree, 9% (n=10) as some college without a degree, 3% (n=3) as trade, technical, or vocational training and 11% (n=13) as a high school diploma. Eighty-five percent (n=98) of the sample reported being currently married or partnered, 11% (n=13) reported being single, 2% (n=2) reported being divorced, 1% (n=1) reported being separated, and 1% (n=1) reported being widowed.

Procedures

Parents completed all measures and the intervention online and were compensated the equivalent of $8/hour for their time. Parents provided consent by signing an online form following a complete description of the eligibility criteria, study goals, and study procedures. All measures, eligibility criteria, study goals and study procedures were approved by the Institutional Review Board. After consent was provided, parents completed a brief intervention in which they viewed photographs of children completing a variety of actions. Parents were provided instructions on what to attend to given their assigned condition (i.e., why, how, look). After the intervention, all parents were invited to complete a series of questionnaires.

Measures

Directed Reflection Intervention

Parents were presented with a series of 27 photographs of young children participating in a variety of actions (e.g., riding a bicycle, watering a plant, eating an ice cream cone; for the photograph set see https://osf.io/9rbpk). These photographs were from a repository of photographs submitted by families for use in research studies. Parents in the current study were randomly assigned to one of three distinct intervention conditions: the why condition, the how condition, and the look condition. For the why condition, parents were instructed to think about why the children participated in the actions. After being asked to think of an answer for each

photograph, they were instructed to click a button to proceed to the next photograph. For the how condition, parents were instructed to think about how the children were doing what they were doing. After being asked to think of answer for each photograph, they were instructed to click a button to proceed to the next photograph. In the look condition, the parents were instructed to look at each photograph without instruction to think about a specific aspect of the children's behavior and then click a button to proceed once they had viewed the photograph.

Mental State Reflection vs. Physical State Reflection

Parents were presented 15 prompts and were instructed to imagine their child (the child who is 18-36 months old, or if the parents had more than one child in this age range to imagine their oldest child in this range). Parents were asked to rate how much each prompt made them think about (a) what their child is doing physically (i.e., physical state reflection), and (b) about their child's thoughts and feelings in this situation (i.e., mental state reflection). Example prompts included "your child is crying at bedtime" and "your child is singing a song you taught them" (for the full measure see https://osf.io/et7pn). Responses were scored on a 10-point Likert scale (1-10) from not at all (1) to very much (10). We found good internal consistency for both physical state reflection (Cronbach's α = .86) and mental state reflection (α = .89).

Depressive Symptoms

Parents completed the Center for Epidemiological Studies-Depression (CES-D; Cosco, Prina, Stubbs, & Wu, 2017) to assess depressive symptoms. Parents responded to 20 items about how they felt during the past week. These items were rated on a 4-point Likert scale ranging from 0 (*rarely or none of the time*) to 3 (*all of the time*). The CES-D has been found to be a reliable and valid measure (Cosco et al., 2017). We found high internal consistency for this measure (α = .93).

Data Analysis

Prior to our primary analyses, Pearson correlations were conducted to examine the bivariate relationships between age, sex, depressive symptoms, mental state reflection, and

physical state reflection. Means, ANOVAs, and a chi-square test of independence were conducted to assess if the groups (i.e., why, how, look) differed in age, sex, or depressive symptoms. We ran these analyses to ensure there were no significant differences in age, sex, or depressive symptoms existed among participants in the three conditions.

For our primary analyses, we focus on mental state reflection adjusting for physical state reflection. Specifically, we subtracted the values for physical state reflection from the values of mental state reflection across all participants. This analytical decision aligns with action identification theory (Vallacher & Wegner, 1987). We are not interested in how much parents reflect about their children in general. We are specifically interested in how much more higher-level reflection parents have about their children's mental states after completing the intervention in comparison to the amount of reflection they have about their child's physical actions.

For aim 1, to test if prompting parents' reflection about other young children's actions (i.e., why + how vs. look) results in greater mental state reflection about one's own child, we conducted a hierarchical regression. In the first step, we entered covariates (i.e., age, sex, and physical state reflection). In the second step, we entered a dummy coded variable for the intervention condition (i.e., why + how) vs. the control condition (i.e., look). By entering the data in two separate steps, we were able to covary for physical state reflection, age and sex while testing how prompting reflection about other young children's actions impacted parents' mental state reflection about their own child.

For aim 2, to test the effect of the type of directed reflection about young children's actions (i.e., why vs. how) on mental state reflection about one's own children, we conducted another hierarchical regression. In the first step, we entered the above-mentioned covariate variables. In the second step, we entered the conditions (i.e., why vs. how). As in the first aim, we entered the data in two separate steps. In this aim, however, we tested how prompting

different types of reflection about young children's actions impacted parents' mental state reflection about their own child.

For aim 3, to test whether depressive symptoms moderate the effects of reflective prompting (i.e., why + how vs. look) on parents' mental state reflection about one's child, we conducted a moderation analysis using PROCESS (Hayes, 2018) in SPSS. We covaried for age, sex, and physical state reflection. All variables were mean-centered. This analysis allows us to assess if the association between prompting reflection and mental state reflection is stronger at different levels of depressive symptoms. Specifically, we tested the conditional effect of the condition (i.e., why + how vs. look) on mental state reflection at the mean and $\pm$1SD of the moderator (i.e., 16th, 50th, and 84th percentiles). To interpret significant interactions, we used the Johnson-Neyman technique in PROCESS, which finds the value of the moderator that produces a significant effect of the predictor variable on the dependent variable (Johnson & Fay, 1950).

RESULTS

Pearson correlations between study variables are presented in Table 1. There was a significant association between physical state reflection and sex (r(115) = -.26, p = .005, 95% CI [-0.42, -0.07]); with mothers reporting more physical state reflection than fathers. In addition, there was a significant positive association between mental state reflection and physical state reflection (r(115) = .55, p < .001, 95% CI [0.39, .70]). Participants exhibiting greater mental state reflection also exhibited more physical state reflection.

ANOVAs were computed to test whether participants in each condition differed in sample characteristics (i.e., age, depressive symptoms) (Table 2). Results of ANOVAs showed that the parents in each condition (i.e., why, how, and look) did not significantly differ in age (F(2,112) = 0.07, p = .937) or depressive symptoms (F(2,112) = 2.94, p = .057). Chi-squared tested indicated that participants in each condition did not significantly differ in sex χ^2(2, N = 115) = 1.56, p = .458.

Table 1

Correlations, Means, and Standard Deviations for Study Variables

Variable	1.	2.	3.	4.	5.	6.
1. Age	-					
2. Sex	.04	-				
3. Physical state reflection	-.12	-.26**	-			
4. Depressive symptoms	-.15	.05	-.06	-		
5. Mental state reflection	-.03	-.18	.55**	-.02	-	
6. Condition	-.00	.11	-.02	.17	.151	-
M	33.70	0.56	6.86	8.37	7.38	0.63
SD	5.33	0.50	1.53	9.60	1.43	0.49

Note. *N* = 115. Correlation is significant at the .05 level (2-tailed). ** Correlation is significant at the .01 level (2-tailed). Sex (Male =1). Condition was coded with 0 = Look and 1 = Why or How.

Table 2

Condition and Total Sample Characteristics

	Look (*N*=43)	How (*N*=37)	Why (*N*=35)	Total (*N*=115)
Age: *M* (*SD*)	33.72 (5.02)	33.46 (5.69)	33.91 (5.46)	33.70 (5.33)
Depressive symptoms: *M* (*SD*)	6.33 (6.68)	7.84 (9.63)	11.46 (11.84)	8.37 (9.60)
Male: *n* (*%*)	22 (51)	16 (43)	13 (37)	51 (44)

Relationship Between Interventions Prompting Reflection and Mental State Reflection

A hierarchical regression was conducted to test if prompting reflection about other young children's actions (i.e., why + how vs. look) results in greater mental state reflection for the parents in our study (Table 3). Condition (why + how vs. look; standardized β = 0.17, p = .034, CI 95% [0.04, 0.95]) significantly predicted parent's parental reflective functioning. After covarying for physical state reflection, age, and sex, prompting reflection about other young children's actions impacted mental state reflection. Specifically, parents in the intervention conditions that prompted reflection reported higher mental state reflection than parents in the look condition.

Relationship Between Type of Directed Reflection Used in the Intervention and Mental State Reflection

A second hierarchical regression was conducted to test if the type of directed reflection about young children's actions (i.e., why vs. how) affect mental state reflection about one's own child (Table 4). Type of directed reflection were not significant predictors of mental state reflection, β = -0.11, p = .264, 95% CI [-0.83, 0.23]. Covarying for age, sex, and physical state reflection, we found that the type of directed reflection did not yield significantly different mental state reflection for the parents in our study.

Moderating Effects of Depressive Symptoms on an Intervention Prompting Reflection and Mental State Reflection

Results of the regression analysis testing the interaction between depressive symptoms and conditions (i.e., why + how vs. look) in predicting mental state reflection indicated that the intervention effect on mental state reflection was significantly moderated by depressive symptoms (Table 5). The intervention effect was not significant at low (16^{th}percentile; β = 0.02,

Table 3

Results of a Regression Analysis Examining the Effects of Condition (Why + How Conditions vs. Look Condition) on Mental State Reflection

Step	*Predictor*	*B*	*SE*	*ß*	*p*	R^2	ΔR^2	*F*	*p*
Step 1	Age	0.03	0.02	0.10	.226				
	Sex	-0.11	0.23	-0.04	.649				
	Physical state reflection	-0.49	0.08	-0.53	<.001	.30	.30	15.13	<.001
Step 2	Intervention vs. look	0.49	0.23	0.17	.034	.32	.03	12.87	<.001

Note. *N* = 115. Dependent variables is mental state reflection. Sex was coded with 0 = female and 1 = male. Intervention was coded as 0 = Look and 1 = Why + How. *B* = Unstandardized coefficient. *ß* = Standardized coefficient.

Table 4

Results of a Regression Analysis Examining the Effects of the Why vs. How Conditions on Mental State Reflection

Step	*Predictor*	*B*	*SE*	*ß*	*p*	R^2	ΔR^2	*F*	*p*
Step 1	Age	0.02	0.02	0.09	.384				
	Sex	-0.16	0.28	-0.06	.567				
	Physical state reflection	-0.54	0.09	-0.60	<.001	.35	.35	12.27	<.001
Step 2	Why vs. how	-0.30	0.27	-0.11	.26	.36	.01	9.56	.264

Note. *N* = 72. Dependent variables is mental state reflection. Sex was coded with 0 = female and 1 = male. Why vs. How was coded with 0 = How and 1 = Why. *B* = Unstandardized coefficient. *ß* = Standardized coefficient.

Table 5

Results of a Regression Analysis Examining the Effects of Depressive Symptoms on Condition (Why vs. How Conditions vs. Look Condition) and Mental State Reflection

Step	*Predictor*	*B*	*SE*	*ß*	*p*	R^2	ΔR^2	*F*	*p*
Step 1	Constant	2.89	0.98		.004				
	Age	0.03	0.02	0.10	.196				
	Sex	-0.14	0.23	-0.05	.557				
	Physical state reflection	-0.47	0.08	-0.57	<.001				
	Why + how vs. look	0.06	0.31	0.02	.837				
	Depressive symptoms	-0.05	0.03	-0.33	.075	.34	.34	9.43	<.001
Step 2	Interaction between intervention and depressive symptoms	0.06	0.03	0.42	.045	.37	.03	4.11	.045

Note. *N* = 115. Dependent variables is mental state reflection. Sex was coded with 0 = female and 1 = male. Why + How vs. Look was coded with 0 = Look and 1 = Why + How. *B* = Unstandardized coefficient. *ß* = Standardized coefficient.

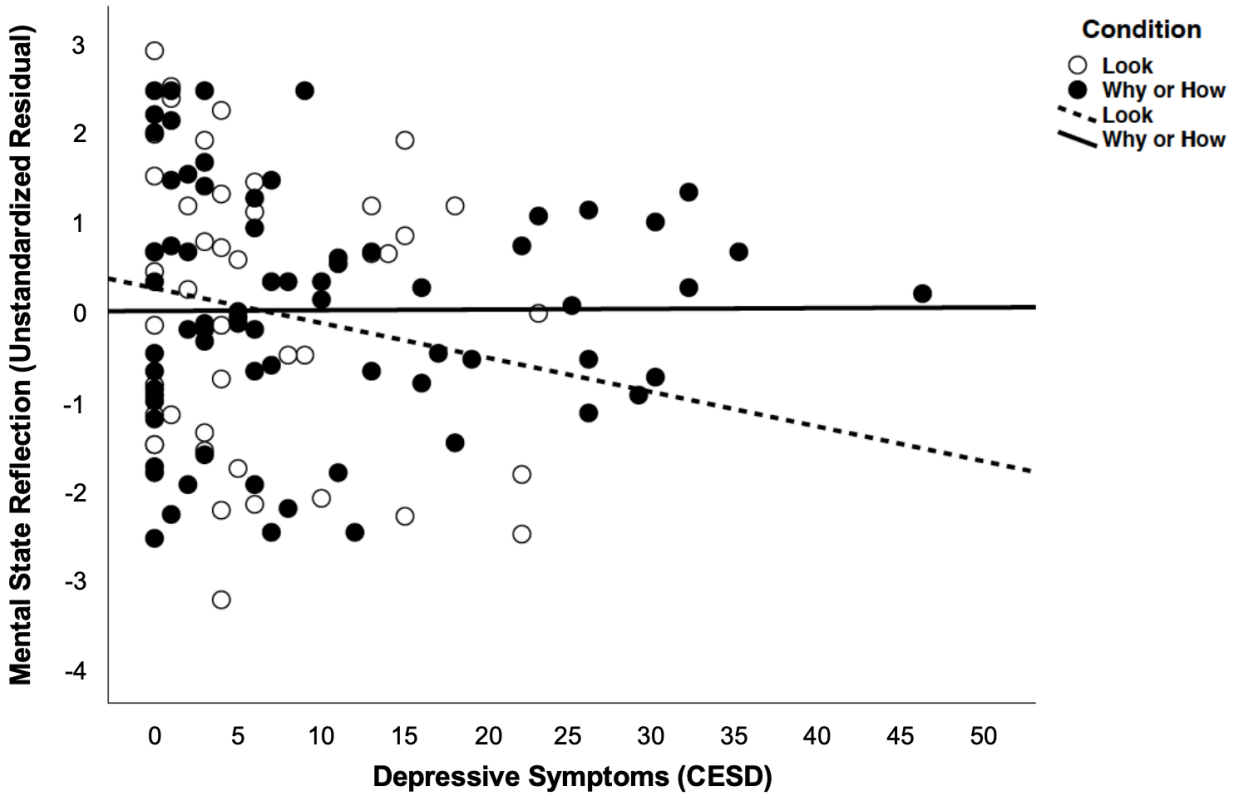
p = .837, CI 95% [-0.55, 0.68]) or average (50th percentile; β = 0.13, p = .122, CI 95% [-0.10, 0.84]) levels of depressive symptoms. However, the intervention effect was significant at high (84th percentile; β = 0.58, p = .005, CI 95% [0.36, 1.97]) levels of depressive symptoms (Figure 1). Results of the Johnson-Neyman indicate that the intervention conditions (i.e., why + how) were associated with greater mental state reflection for individuals with CES-D scores of 6.43 or greater.

DISCUSSION

The current study aimed to provide a preliminary test for the modifiability of parental reflective functioning using a brief intervention administered online. We found evidence that interventions aimed to prompt reflection (i.e., why + how) about other young children's actions resulted in greater parental reflective functioning about one's own child when compared with a control condition (i.e., look). With regard to the type of intervention, there was no significant difference found in parental reflective functioning for those in the why vs. how conditions Depressive symptoms were found to moderate the effects of reflective prompting (i.e., why + how vs. look) on mental state reflection. Specifically, the intervention effect on mental state reflection is not significantly moderated by low or average levels of depressive symptoms but is significantly moderated by high levels of depressive symptoms. Previous research demonstrated the effectiveness of short interventions, such as one session of video-guided feedback, to enhance parents' mentalization about their children (Pajulo et al., 2012; Schacht et al., 2017).The present study extends these findings and examines if directed reflection on other young children's actions (i.e., reflect on either why or how a young child in a photograph completes an action) enhance parents' reflective functioning relative to a control condition. Not surprisingly, parents assigned to the why or how conditions, in comparison to control conditions, reported more reflective functioning about their own child. This aligns with extant research on

Figure 1

Association between Depressive Symptoms and Mental State Reflection in Each Condition



mentalization-based interventions (Camoirano, 2017). This study also provides preliminary support for the modifiability of parental reflective functioning with a brief online intervention. Prompting reflection about other young children's actions may be a strategy to increase parents' parental reflective functioning about their own child.

Previous interventions aimed at increasing parental mentalizing involved tailored video-feedback focused on encouraging attunement and reflective functioning (Pajulo et al., 2012; Schacht et al., 2017). As noted above, these interventions require substantial resources to implement. For the present study, we tested how different interventions that encourage different types of directed reflection about other young children's actions leveraged modifications to parents' parental reflective functioning. Drawing on previous action identification theory research (Spunt, Satpute, & Lieberman, 2011; Vallacher & Wegner, 1987), we tested two interventions. The first of these interventions encouraged mechanization and asked parents to focus on the concrete actions involved in how the children in the photographs completed the actions. The second of these interventions encouraged mentalization and asked parents to focus on the parental reflective functioning that may explain why the children in the photographs completed the task. In the present study, we failed to find significant differences in parental reflective functioning for parents assigned to the why or how conditions. This suggests that prompting either type of directed reflection, mechanizing or mentalizing, modifies parental reflective functioning. Prompting different types of directed reflection, such as mechanizing or mentalizing, did not lead to different levels of parents' parental reflective functioning parental reflective functioning about one's own child.

Evidence suggests that parents with depression show increased self-focus with their own internal state; depressive symptoms may inhibit parents' ability to reflect on the internal states of their children (Ernst & McMahon, 2004, Salo et al., 2020). Results of our study suggest that depressive symptoms may moderate the relationship between reflective prompting on parents' parental reflective functioning. We found that the effect of the intervention was moderated by

depressive symptoms; specifically, the intervention significantly increased mental state reflection only for parents high in depressive symptoms. This is consistent with previous research in which individuals with more symptoms may possess a greater capacity for improvement through interventions (Stjerneklar et al., 2019).

The results of the current proof of concept study present possible implications for clinical application. First, as mentioned above, many interventions aimed at enhancing parental mentalizing provide parents with direct feedback about their own recorded interactions with their child. The results from the current study suggest that interventions encouraging parental reflection about any child improve a parent's ability to mentalize about their own child. Future research should probe if there is a significantly difference in parental reflective functioning after interventions that provide directed feedback about their child in comparison to directed feedback about another child. Second, many interventions utilized to enhance parental reflection focus on directing parents to mentalize about their children. The results from the current study suggest that parents benefit from being encouraged to both mechanize and mentalize about the depicted children. Although it is less intuitive that mechanization would be valuable for enhancing parental reflective function, this intervention strategy may be easier for parents who prefer not to mentalize about their children. Future research should continue to examine if parental reflective functioning can be enhanced by directing parents to either mechanize or mentalize about other children. Further, additional research can assess how parents with different preferences regarding reflective functioning may benefit from one treatment over the other. Last, previous research suggests that parents with depressive symptoms tend to be preoccupied with their own emotional state (Ernst & McMahon, 2004) and thus may possess more potential for improvement from interventions targeting parental reflective functioning. The results of the current study suggest that parents with subthreshold depression symptoms have significantly greater parental reflective functioning about their own child after being instructed to consider aspects of another child's actions. Future research should focus on the results of longitudinal

studies to assess the long-term efficacy of a brief parental reflective functioning intervention for parents with depressive symptoms. The parental reflective functioning intervention demonstrated that general directed reflection and can be utilized to improve parental reflective functioning even for parents with subthreshold depressive symptoms.

Of course, there are limitations to this study. First, collection of data and assessment of all constructs occurred cross-sectionally and through parental self-report. We do not know if the intervention changed parents' parental reflective functioning in their interactions with their child or simply served as a brief reminder for parents to mentalize during the study. Thus, the current results serve as preliminary evidence for the modifiability of parental reflective functioning; however, longitudinal studies must be conducted to test the long-term effects of the online intervention. Further, we cannot be certain that participants in the study truly have a child or have a child within the target age range of 12 to 36 months. We took precautions to remove invalid Mechanical Turk responses. We removed responses with exact matches and repeats for IP address or geolocation as well eliminated responses of participants that answered the check question incorrectly. However, we cannot be certain that participants meet the intended study criteria. Another study limitation is that the sets of photographs used in the directed reflection intervention were not standardized for the emotion, context, age, sex, or race/ethnicity of the depicted children. Last, although parents were randomly assigned to study conditions, there was a trend level difference in depressive symptoms across study groups.

In conclusion, findings from this study provide evidence for the modifiability of parental reflective functioning using a brief online intervention. Encouraging parents to have directed thinking about young children's actions (i.e., instructions to reflect on why or how the child acted as depicted) resulted in more parental reflective functioning about their own children. Further, we found evidence that parents with greater depressive symptoms, a group at increased risk for less empathy toward their children and reduced positive and increased negative parenting

behaviors, may benefit the most from interventions aimed at enhancing parental reflective functioning.

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