

# Caregivers' positive emotion socialization tendencies are associated with positive affect in preschool age children

Kaylin E. Hill  | Autumn Kujawa  | Kathryn L. Humphreys 

Psychology & Human Development,  
Vanderbilt University, Nashville,  
Tennessee, USA

## Correspondence

Kaylin E. Hill, 230 Appleton Place #552,  
Nashville, TN 37203, USA.  
Email: [kaylin.hill@vanderbilt.edu](mailto:kaylin.hill@vanderbilt.edu)

## Funding information

National Institutes of Health,  
Grant/Award Numbers: UL1 TR000445,  
T32 MH18921; National Science  
Foundation, Grant/Award Number:  
2042285; Jacobs Foundation Early Career  
Research Fellowship, Grant/Award  
Number: 2017-1261-05

## Abstract

Longstanding theories of emotion socialization postulate that caregiver emotional and behavioral reactions to a child's emotions together shape the child's emotion displays over time. Despite the notable importance of positive valence system function, the majority of research on caregiver emotion socialization focuses on negative valence system emotions. In the current project, we leveraged a relatively large cross-sectional study of caregivers ( $N = 234$ ; 93.59% White) of preschool aged children to investigate whether and to what degree, caregiver (1) emotional experiences, or (2) external behaviors, in the context of preschoolers' positive emotion displays in caregiver-child interactions, are associated with children's general positive affect tendencies. Results indicated that, in the context of everyday caregiver-child interactions, caregiver-reported positively valenced emotions but not approach behaviors were positively associated with child general positive affect tendencies. However, when examining specific caregiver behaviors in response to everyday child positive emotion displays, caregiver report of narrating the child's emotion and joining in the emotion with their child was positively associated with child general positive affect tendencies. Together, these results suggest that in everyday caregiver-child interactions, caregivers' emotional experiences and attunement with the child play a role in shaping preschoolers' overall tendencies toward positive affect.

## KEYWORDS

caregiver emotion socialization, emotion displays, positive affect, preschool children

## 1 | INTRODUCTION

Positive valence systems (PVS) in the National Institute of Mental Health Research Domain Criteria (RDoC) framework consist of behavioral and physiological processes underlying positive affect and responses to motivational situations or contexts and rewards (National Institute of Mental Health, 2022; Olino, 2016). Mounting empirical evidence indicates that blunted PVS function is related to mental and physical health problems, in that deficits in this domain may serve as both a mechanism and a

moderator of the effects of stress on the emergence of mental health concerns (for a review, see Kujawa et al., 2020). There is evidence to indicate that blunted PVS function serves as a separate vulnerability factor from negative valence system (NVS) function, that is, processes underlying negative affect and responses to aversive situations and contexts (Kujawa et al., 2016; National Institute of Mental Health, 2022), and reduced PVS function predicts multiple forms of psychopathology, particularly depression, in youth and adults (Bylsma, 2021; Halahakoon et al., 2020; Keren et al., 2018; Luyten & Fonagy, 2018; Proudfit et al.,

2015). Further, there is evidence to suggest that NVS and PVS functioning are independently associated with different clinical features, social functioning, and treatment response (Medeiros et al., 2020; Taylor et al., 2020). Thus, while NVS function has received greater focus in psychopathology and emotion socialization research (Aktar & Bogels, 2017; Joiner et al., 1996), a better understanding of PVS is critical to promoting healthy functioning.

Caregiver–child relationships are considered fundamental to child survival, safety, and neurodevelopment (Hastings & Kahle, 2019; King et al., 2021; Nelson et al., 2016), and the social processes within caregiving relationships represent the primary context for early emotional development. Caregiver emotion socialization includes the ways in which caregivers model and teach their children to understand, express, and regulate emotions (Breux et al., 2022; Eisenberg et al., 1998; Leerkes & Bailes, 2019). Longstanding theories of emotion socialization postulate that caregiver emotional and behavioral reactions to a child's emotions together shape the child's emotion displays over time (Eisenberg et al., 1998). Importantly, two prominent theoretical models used to understand dynamic caregiver–child relationships—behaviorism and attachment theory—emphasize the importance of caregiver emotion socialization in repeated caregiver–child interactions that go on to influence the development of affective styles in children (Field & Fogel, 1982; Troutman, 2015b, 2015c). From a behavioral perspective, reinforcement learning principles indicate that caregiver emotion socialization considered by the child to be rewarding in response to the child's emotion display would increase similar emotion displays in the future, cumulatively supporting children's general affective style (Troutman, 2015b). From an attachment perspective, there are several caregiver emotion socialization tendencies that are likely to be reinforcing to the child's emotion displays. These include greater sensitive responsiveness (e.g., caregiver picks up child who is smiling and reaching for them), attunement (e.g., coexperienced positive affect), and delight in child (e.g., positive affect toward child or child's actions) (Troutman, 2015c). Together, both behavioral and attachment theories suggest that caregiver positive affect (e.g., caregiver is happy when child is happy) and approach behaviors (e.g., approach their child, hold their child) may increase a child's general tendency for positive affect displays.

Despite the notable importance of PVS function, the majority of research on caregiver emotion socialization focuses on NVS emotions such as fear, sadness, and distress (Johnson et al., 2017; Luebbe et al., 2011; Ramakrishnan et al., 2019; Schwartz et al., 2012). Nonetheless, the emotion socialization literature to date indicates that caregiver responses to child emotions are particularly important for

### Statement of Relevance

Caregiver positive emotions and specific approach behaviors related to attunement may be effective targets for interventions geared toward increasing child positive affect tendencies.

### Three key findings

1. In everyday caregiver–child interactions, caregiver positive emotional experiences and attunement with the child are associated with children's positive emotion display tendencies.
2. Results support both behavioral approaches and attachment theory, in which coexperienced positive emotions and approach behaviors are believed to build over time to foster child positive affect tendencies.
3. Implications include that prevention and intervention efforts targeting caregiver emotional responses to child positive affect may be important for shaping child emotionality.

understanding and explaining child general affective style over time. Broadly, a large literature supports the proposal that caregiver emotion socialization, including caregivers' responses to their own and their children's emotions, influence children's emotional functioning in both momentary contexts and their culmination in general affective style (Leerkes & Bailes, 2019). Altogether, the leading theories of emotion socialization and caregiving, crafted over the past 80 years, converge on the notion that caregiver responses in daily contexts, that is, caregivers' emotional and behavioral responses to their children's emotion displays in everyday interactions, contribute to their children's general tendencies to express positive affect (Field & Fogel, 1982; Leerkes & Bailes, 2019; Troutman, 2015b, 2015c). In concert with what would be hypothesized by both behavioral and attachment theories, a recent review of the parent emotion socialization literature—notable for its focus on PVS development—highlighted the ways in which caregiver positive emotion socialization, including expressions of positive emotions and reactions to their children's positive emotions, are associated with child positive emotions including experiences, expression, cultivation, and regulation (Breux et al., 2022). Questions remain, however, on whether and to what degree caregiver emotional experiences may have direct effects on child positive

affective style or if caregiver emotions merely influence caregiver behaviors which play the primary role for child emotion socialization. Leading theories and recent empirical research suggest that caregiver emotional experiences indeed play an independent role from caregiver behaviors in child emotion socialization.

The affective organization of parenting framework (Dix, 1991) states that emotions drive behaviors and that caregivers' emotional experiences to their children's emotion displays are the most proximal predictors of the emotion socialization experienced by their children. Indeed, emotion expression is a type of behavior, but these theories center on caregivers' experienced emotions, which then may or may not relate to their outward expression of these emotions. That is, caregivers' emotional responses and external behavior may each be independently associated with their child's experience of emotion socialization (Hajal & Paley, 2020; Leerkes, 2010; Morris et al., 2007; Rutherford et al., 2015). Empirical work indicates that caregivers' authentic emotion displays in response to their children may be more salient to their children than caregivers' behavioral responses (e.g., a child observing their caregiver's joy may be more salient for emotion socialization than a caregiver offering to hold their child) (Le & Impett, 2016). Moreover, recent compelling work also suggests that shared positive affect may be particularly important to shaping caregiver and child PVS functioning and well-being (Brown & Fredrickson, 2021; Brown et al., 2022).

In the current project, we conducted a cross-sectional study of parents and preschool aged children to investigate whether and to what degree, caregiver (1) emotions, or (2) behaviors in the context of preschoolers' positive emotion displays in caregiver-child interactions, are associated with children's general positive affect tendencies. According to Eisenberg's initial emotion socialization perspective, caregiver emotions and behaviors in such interactions each independently relate their children's general positive affect tendencies (Eisenberg et al., 1998). Behavioral and attachment perspectives build on this perspective to suggest that a greater number of caregiver positive emotions (e.g., happiness, joy, or delight in child) and caregiver approach behaviors (e.g., approach their child, hold their child, express positively valenced feelings toward child) each in response to preschoolers' positive emotion displays in everyday interactions, over time, build to be associated with greater child positive affect tendencies. Thus, we hypothesize that both caregivers' positively valenced emotions and approach behaviors in everyday interactions will be associated with their children's general positive affect tendencies. Alternatively, multiple sources of contemporary evidence suggest that caregiver emo-

tions may play a larger role than caregiver behaviors in supporting children's general positive affect tendencies over time. Specifically, Le and Impett (2016) and Brown and colleagues (2022) each found that caregiver emotions are more salient than behaviors to their children, especially when emotions are coexperienced between caregiver and child; thus, a competing hypothesis is that caregiver emotions, reported in the context of their child's positive emotion displays, will have the strongest association with their child's general positive affect tendencies. Second, to investigate whether and to what degree different types of caregiver behaviors, in the context of their child's positive emotion displays, are associated with children's general positive affect tendencies. Both behavioral and attachment perspectives converge in considering that approach behaviors and provision of emotional support from caregiver will increase child general positive affect (i.e., through reinforcement and sensitive responsiveness, attunement, and delight in child, respectively), whereas punishment (e.g., walking away from the child, mocking or teasing the child) will decrease general positive affect.

## 2 | METHOD

### 2.1 | Participants

Participants ( $N = 234$ ) were parents of children 3–5 years of age (parent age in years:  $M = 35.62$ ,  $SD = 4.13$ ; child age in months:  $M = 53.37$ ,  $SD = 9.94$ ). Participants were recruited such that parents of the same child could each participate in the study. Two hundred and fifty-five individuals originally completed the study; however, 21 individuals' responses were removed due to failed attention checks. In total, 234 parents of 152 children participated in the study ( $n = 88$  children had two parents that participated and  $n = 58$  children had one parent who participated in the current study). Participants were recruited from the Nashville, TN, USA surrounding area through parenting listservs and discussion from other participants. Inclusion criteria included having a child age 3–5.99 years and fluency in the English language. Over half (58.12%) of caregiver participants reported identified as women. Parent participants were 93.59% White, 2.56% Black/African American, 2.14% Asian, and 1.71% identified as biracial; 3.85% identified as Hispanic/Latine. Parent participants indicated that the 51.50% of the target children were assigned female at birth. Parent participants also indicated that their children were 90.60% White, 3% Black/African American, 1.71% Asian, and 3.85% identified as biracial; 4.78% identified as Hispanic/Latine.

## 2.2 | Procedure

Study procedures were approved by the Institutional Review Board at Vanderbilt University. Before initiation of study procedures, informed consent was obtained from the participants. Participants then completed a battery of questionnaires, including those in the present study. Study questionnaires are freely available through OSF ([osf.io/58aev](https://osf.io/58aev); [osf.io/9m5h8](https://osf.io/9m5h8)). Total questionnaire completion time was approximately 1 hour. Participants were compensated for their time.

## 2.3 | Measures

### 2.3.1 | Comfort, attunement, and validation of emotions (CAVE) questionnaire

The CAVE Questionnaire (Humphreys & Lempres, 2021) measures caregivers' ability to be emotionally available and in-tune with a child's needs when their child exhibits either positive or negative emotions. Participants rated how likely they would feel emotions or exhibit behavioral responses when their child expresses each positive or negative emotion using a 6-point Likert-type scale. Each item inquires specifically to caregiver responses to child affect displays in reaction to the caregiver (e.g., "When my child expresses happiness because of me, I would..."). Scores were scaled with  $-3$  (*very unlikely*) and  $3$  representing (*very likely*). Thus, negative scores indicate that a caregiver is unlikely to experience or exhibit a certain response and positive scores indicated that a caregiver is likely to experience or exhibit a certain response. To examine caregiver emotion and behavior responses, scores were averaged across caregiver emotion and behavior items in response to three child positive emotion displays to examine typical caregiver emotion and behavioral responses, respectively. The current study examined positively valenced caregiver emotions (i.e., excited, happy, calm, proud) and approach behaviors (i.e., hold my child, narrate/reflect on what the child is doing, and join with child) in response to everyday displays of child positive emotion in the planned analyses. In a second analysis, we also examined the full range of possible caregiver behaviors reported in response to specific instances of child positive emotions. These behaviors included those across approach (i.e., hold my child, narrate/reflect on what the child is doing, and join with child), punish (i.e., tell the child to stop, walk away from the child, mock or tease the child), and redirect (i.e., distract) domains.

### 2.3.2 | Frequency of emotions: Positive affect

General positive affect tendency was obtained via the Frequency of Emotions scale (Lempres & Humphreys, 2021) to capture the frequency with which the child expresses happiness, excitement, and sympathy/kindness. This measure was developed to capture potential individual differences in the frequency in which children were observed to display various emotions in their daily lives. Participants were asked to rate the frequency with which their child expresses each emotion on a scale from 0 (*Not at all*) to 5 (*Multiple times a day*). Frequency scores were calculated as the mean of all responses.

## 2.4 | Data analysis

Data were analyzed in R (R Core Team, 2022) using *moments* (Komsta & Novomestky, 2022) to examine skewness and kurtosis, *lmtest* (Zeileis & Hothorn, 2002) to conduct regression models, *lm.beta* (Behrendt, 2022) to produce standardized coefficients, and *sandwich* (Zeileis, 2004) to estimate clustered robust standard errors (CRSE). All parametric analyses used CRSE in R to estimate standard errors due to the existence of nonindependent caregiver reports in some cases (i.e., two parents responding about the same child). Deidentified data are available on OSF (<https://osf.io/4prgz/>). For the analyses, first the Pearson  $r$  correlation coefficient was used to examine bivariate associations; except Kendall's  $\tau b$  index was used to examine the association between the two binary variables caregiver gender and child sex. Next, multiple linear regression analyses were conducted to test the unique effects of caregiver feelings and behaviors in the context of child instances of positive emotion displays in explaining variance in child general tendencies to display positive affect. The first model regressed child general positive affect tendencies onto caregiver reports of their positively valenced emotions, caregiver approach behaviors to everyday instances of their child's positive emotion displays, and the interaction between caregiver emotions and behaviors. The interaction term was included to examine if the association between caregiver behaviors and child general positive affect tendencies may be moderated by caregiver emotions. Independent variables were centered prior to analysis. Next, the second model regressed child general positive affect tendencies onto all possible caregiver behaviors to everyday instances of their child's positive emotion displays (i.e., hold my child, distract my child, tell the child to stop, walk away from the child, narrate actions/feelings and join with child, mock or tease the child).

**TABLE 1** Descriptive statistics and bivariate correlations between study variables.

	<i>M</i>	<i>SD</i>	<i>skew</i>	<i>kurtosis</i>	1	2	3	4	5	6
1. Child general positive affect tendencies	4.41	.47	−.81	3.57	1					
2. Caregiver emotions	2.20	.64	−.80	2.98	.20***	1				
3. Caregiver behaviors	1.94	.93	−1.10	4.14	.17*	.46***	1			
4. Caregiver age (years)	35.62	4.13	.02	3.38	−.17**	−.05	−.05	1		
5. Child age (months)	53.37	9.94	.08	1.90	−.21**	−.17*	−.10	.08	1	
6. Caregiver gender (% woman)	58.12	–	–	–	.08	.14*	.17**	−.15***	.01	1
7. Child sex (% female)	51.50	–	–	–	−.01	−.12	−.06	.13	−.02	−.02

Note: Correlation estimates account for clustering in families. *Caregiver emotions* and *Caregiver behaviors* represent caregiver self-reported positively valenced emotions and approach behaviors in response to everyday child positive emotion displays reported on the CAVE questionnaire.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**TABLE 2** Descriptive statistics of caregiver self-reported positively valenced emotions and endorsed behaviors in response to everyday child positive emotion displays reported on the CAVE questionnaire.

	<i>M</i>	<i>SD</i>
1. Feel excited	2.04	1.05
2. Feel happy	2.74	0.47
3. Feel calm	1.57	1.13
4. Feel proud	2.24	0.90
5. Hold the child	1.59	1.32
6. Distract the child	−2.83	0.40
7. Tell the child to stop	−2.87	0.34
8. Walk away from the child	−2.94	0.26
9. Narrate and join with child	2.28	0.89
10. Mock or tease the child	−2.96	0.18

Note: Scores on the CAVE questionnaire were scaled with  $-3$  (*very unlikely*) and  $3$  representing (*very likely*). Thus, negative scores indicate that a caregiver is unlikely to experience or exhibit a certain response and positive scores indicated that a caregiver is likely to experience or exhibit a certain response.

### 3 | RESULTS

#### 3.1 | Descriptive statistics

Table 1 presents means, standard deviations, and bivariate correlations between study variables. Child general positive affective style was positively associated with caregiver positively valenced emotions and approach behaviors to everyday child emotion displays. Caregiver positively valenced emotions and approach behaviors shared a strong positive association. Caregiver age was associated with decreased child general positive affect tendencies, and child age was associated with decreased child general positive affect tendencies and decreased caregiver positively valenced emotions to everyday child emotion displays. Caregiver gender shared a small association with caregiver age, such that women in the sample tended to be younger than men.

Table 2 presents means and standard deviations of caregiver self-report of experiencing emotions and engaging in behaviors in the context of child positive emotion displays in everyday interactions.

#### 3.2 | Caregiver feelings and behaviors in relation to child positive affect displays

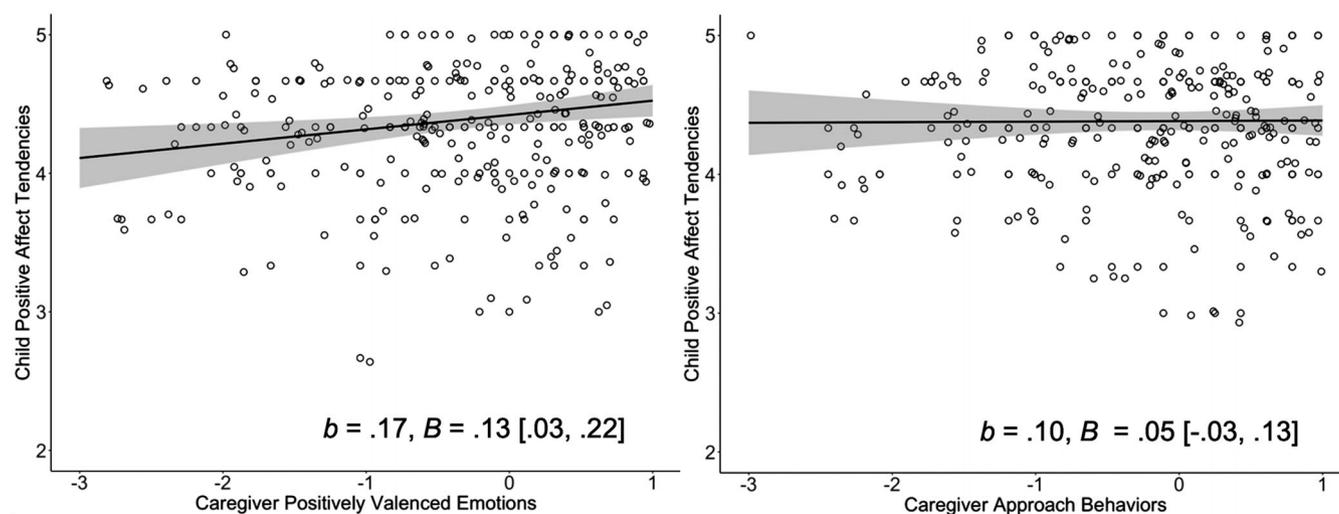
Table 3 and Figure 1 present caregiver positively valenced emotions and approach behaviors in response to children's everyday positive emotion displays. Caregiver positively valenced emotions, and not approach behaviors, were positively associated with child general positive affect tendencies,  $F(3, 230) = 4.05$ ,  $p = .007$ ,  $R^2 = .05$ .<sup>1</sup>

<sup>1</sup> These results were maintained when considering all possible caregiver behaviors, including those that may be expected to support or punish children's positive affect expression,  $F(3, 230) = 4.06$ ,  $p = .008$ ,  $R^2 = .05$ .

**TABLE 3** Results of regression analyses examining overall child frequency of positive emotions and caregiver feelings and behaviors in response to child positive affect displays.

<b>Outcome: Child general positive affect tendencies</b>	<b>b</b>	<b>B</b>	<b>CRSE (B)</b>	<b>CI low</b>	<b>CI high</b>	<b>t</b>	<b>p</b>
<b>Caregiver emotions</b>	<b>.17</b>	<b>.13</b>	<b>.05</b>	<b>.03</b>	<b>.22</b>	<b>2.63</b>	<b>.009</b>
Caregiver behaviors	.10	.05	.04	-.03	.13	1.27	.206
Caregiver emotions*behaviors	.05	.03	.04	-.05	.11	0.69	.493
<b>Outcome: Child general positive affect tendencies</b>	<b>b</b>	<b>B</b>	<b>CRSE (B)</b>	<b>CI low</b>	<b>CI high</b>	<b>t</b>	<b>p</b>
Hold my child	.01	<.01	.02	-.05	.05	0.09	.927
Distract my child	-.13	-.16	.08	-.31	<.01	-1.93	.055
Tell child to stop	.12	.17	.09	-.01	.34	1.84	.067
Walk away from child	-.05	-.08	.11	-.29	.13	-0.73	.469
<b>Narrate and join with child</b>	<b>.20</b>	<b>.11</b>	<b>.05</b>	<b>.02</b>	<b>.20</b>	<b>2.37</b>	<b>.019</b>
Mock or tease child	-.02	-.06	.17	-.39	.27	-.35	.730

Note: *b* = standardized regression coefficients. *B* = Unstandardized regression coefficients. *CRSE* = clustered robust standard errors; used to estimate standard errors due to the existence of clustered caregiver reports in some cases (i.e., two parents responding about the same child). *CI* = 95% confidence interval.



**FIGURE 1** Scatterplot, linear model, and confidence interval for each of the associations from the primary regression analyses. *Caregiver Positively Valenced Emotions (CAVE)* = Caregiver positively valenced emotions (i.e., attentive, excited, happy, calm, proud) in response to everyday displays of child positive emotion from the CAVE questionnaire. *Caregiver Approach Behaviors* = Caregiver approach behaviors (i.e., hold my child, narrate/reflect on what the child is doing, and join with child) in response to everyday displays of child positive emotion in the planned analyses from the CAVE questionnaire. *Child Positive Affect Tendencies* = The frequency with which the child expresses happiness, excitement, and sympathy/kindness from the Frequency of Emotions Scale. Scores on the CAVE questionnaire are standardized such that 0 = Mean and 1 = SD. Fitted line and 95% CI represents the linear model of caregiver positively valenced emotions and approach behaviors regressed onto child positive affect tendencies. *b* = Standardized regression coefficient; *B* = Unstandardized regression coefficient; [95% confidence interval].

When considering the various behaviors caregivers may exhibit in response to child everyday positive emotion displays, the overall model was statistically significant,  $F(6, 227) = 2.70$ ,  $p = .015$ ,  $R^2 = .07$ . See Table 3. Caregiver behaviors of narrating and joining with their child were statistically significantly associated with child general positive affect tendencies, such that greater caregiver report of joining their child in shared affect expres-

sions was associated with greater child general positive affect.

## 4 | DISCUSSION

The primary aims of the present study were to (1) investigate whether and to what degree caregiver emotions and

behaviors, in the context of preschoolers' positive emotion displays in caregiver-child interactions, are associated with children's general positive affect tendencies; and (2) to investigate whether and to what degree different *types* of caregiver behaviors are associated with children's general positive affect tendencies. Results indicated that, in the context of everyday caregiver-child interactions, caregiver-reported positively valenced emotions but not approach behaviors were positively associated with child general positive affect tendencies. However, when examining specific caregiver behaviors in response to everyday child positive emotion displays, caregiver report of narrating the child's emotion and joining in the emotion with their child were positively associated with child general positive affect tendencies. Together, these results suggest that caregivers' emotional experiences in response to their preschoolers' emotion displays play a role in shaping preschoolers' overall tendencies toward positive affect. It may be that caregiver emotions are expressed outside of specific approach behaviors in perhaps more subtle signals or cues (e.g., emotional signaling from facial expression, gesture, or vocal tone), which impact the child's emotional experience and meaning making (Oppenheim, 2006). In other words, children observe and interpret caregiver cues related to their emotional experiences such that, when positively valenced and in response to the child in everyday interactions, it feels rewarding to the child and affects their view of self (Bowlby, 1988; Bretherton & Munholland, 1999). Moreover, these results suggest specificity in the effects of caregivers' behaviors in response to their preschoolers' emotion displays such that narrate/join behaviors may increase positive affect displays. Other caregiver behaviors in response to everyday child positive emotion displays, such as holding the child, telling the child to stop, walking away from the child, mocking or teasing the child, were not significantly associated with overall child positive affect tendencies.

The current results support previous findings that caregiver emotions are important in child emotion socialization (Dix, 1991) and that caregiver emotions may be particularly important above and beyond other factors such as caregivers' exhibited behaviors (Brown & Fredrickson, 2021; Brown et al., 2022; Le & Impett, 2016; Leerkes & Augustine, 2019). The present study focused on caregiver positively valenced emotions and thus results support behavioral and attachment theories which state that a greater number of caregiver positive emotions (e.g., happiness, joy, or delight in child) each in response to preschoolers' positive emotion displays in everyday interactions, over time, build to be associated with greater child positive affect tendencies. Notably, previous work has demonstrated that caregiver positive affect is associated with sensitive, supportive caregiving (Rueger et al.,

2011) suggesting that caregiver reported emotional experiences may be important in their own regard in response to child positive emotion (e.g., shared positive affect) and also conducive to other caregiving practices that scaffold child positive affect tendencies (e.g., sensitive, supportive caregiving), though note that while both caregiver warmth and sensitivity are aspects of "positive parenting" (Eisenberg et al., 1998, 2005), there is evidence that these are separable dimensions of caregiving (Davidov & Grusec, 2006; King et al., 2019).

When focusing on caregiver behaviors in the context of child positive emotion specifically, one reported behavior was associated with child positive affect tendencies. Notably, in line with our hypotheses, results indicated that the more caregivers engaged in narrating the child's experience and joining with the child in response to everyday displays of child positive emotion, the more positive affect tendencies were reported in their children. This finding again provides empirical support for behavioral and attachment theories which state that a greater number of caregiver approach behaviors (e.g., approach their child, hold their child, express positively valenced feelings toward child) each in response to preschoolers' positive emotion displays in everyday interactions, over time, build to greater child positive affect tendencies. Interestingly, the present study did not find evidence that caregiver punishment behaviors (e.g., tell the child to stop, walk away from the child, mock or tease the child) were associated with children's positive emotion displays. However, the null findings may be due to floor effects (e.g., low endorsement and low variance) for these items as few parents reporting engaging in these behaviors.

There are several notable implications for this work. Broadly, this study is an empirical investigation that provides further evidence of the importance of considering caregiver social processes in the RDoC framework (King et al., 2021). Specifically, this study provides preliminary support that caregiver emotion socialization affects RDoC PVS development in young children. Additionally, attenuated PVS development is associated with increased depression risk (Olino, 2016). Prior work indicates that caregiver emotion socialization may contribute to this development; for example, Luebbe et al. (2011) demonstrated that caregiver responses that were characterized by minimizing emotional experiences and punishing emotion displays were prospectively associated with greater internalizing psychopathology in their children at a follow-up assessment 1 year later. In the present study, increased PVS function in children was associated with caregiver positive affective emotions and approach behaviors, possibly offering implications for future clinical translation (i.e., increasing shared positive affect via parent-child interaction therapy; PCIT) (Eyberg & Funderburk, 2011;

McNeil & Hembree-Kigin, 2010; Troutman, 2015a; Urquiza et al., 2011). Moreover, early preventative interventions (i.e., in children's preschool years) may be key to protecting against risk as research to date indicates that observations of NVS and PVS behavioral displays in early childhood differentially relate to emotion processing 3 years later (Kessel et al., 2017).

Strengths of the current study include the focus on caregiver-child social processes, specifically caregiver emotion socialization, specifically in the PVS domain. While PVS development has important implications for future functioning (Kujawa et al., 2020), a majority of research to date has focused on NVS processes in children and caregiver-child relationships (Aktar & Bogels, 2017; Joiner et al., 1996). There are also several limitations to the current study including the reliance on self- and child-report from caregivers. While self-report measures may be less influenced by laboratory procedures than behavioral assessment in the laboratory, and thus capture *everyday* functioning in the caregiver-child dyad, these measures are also susceptible to reporting bias (Mangelsdorf et al., 2000; Miller et al., 2017). Relatedly, a second limitation is the use of novel measures of caregiver responses to child emotion displays and children's positive affect tendencies. Future investigations should consider replicating and extending this study which provides preliminary support for use of these measures. Additionally, the current investigation was cross-sectional and while results may provide a basis for future work to consider causal relations, the temporal ordering of associations needs to be investigated. It is likely that the influence of everyday interactions "add up" over time in a way to shape general affective tendencies (Troutman, 2015a, 2015b, 2015c), though bidirectional associations and reciprocal interactions between caregivers and children are also plausible models (Pettit & Arsiwalla, 2008). For example, children who express more positive affect may also pull for more positive emotions from their caregivers. However, there may be a threshold for this association as preliminary evidence suggests that children with attention deficit hyperactivity disorder report more punitive and override responses from their caregivers for expressions of joy (Brown, 2006).

Further, the current investigation did not examine the possible role of genetics in preschoolers' general positive affect tendencies. It is possible and plausible that children's affective tendencies are formed in part due to caregiver-child interactions and in part due to genetic disposition (Saudino, 2005; Saudino & Micalizzi, 2015). In particular, teasing apart passive and evocative genotype-environment correlations, that is, the association between genotypes and environments children inherit from caregivers and the association between children's genetically

influenced behaviors and caregivers' reactions to that behavior, respectively (Jaffee & Price, 2008), may help researchers to develop more effective treatments or preventative interventions for child PVS function. Genetically informed research designs are needed to examine the role of genetics in child general positive affect tendencies and the possible translational implications of teasing apart passive and evocative genotype-environment correlations. Last, the current results were observed in a sample composed primarily of White United States residents from the mid-South, and the generalization of these results should be considered in context. First, in the United States, higher intensity positive affect is generally prized in comparison to other affective states and relative to other cultural contexts (Tsai, 2017). Second, ideal affect, and related emotion socialization processes, differ across and within cultures. As such, the current results provide preliminary insight toward the associations amongst caregiver emotional experiences, caregiver behaviors, and child positive affect tendencies with respect to individual differences observed in the present sample. The extent to which these associations may vary by cultural values, especially those with regard to affect or caregiving behaviors, remains to be examined (e.g., Tsai, 2007). Altogether, caregiver and child characteristics such as personality, psychopathology or psychopathology risk, and culture (with respect to class, education, ethnic identity, racial background, acculturation, and religion) all likely affect the associations demonstrated here (for broader discussion of these issues, see Breaux et al., 2022; Tsai, 2007).

In conclusion, the current study builds on the large caregiving and emotion socialization literature by examining these processes in the context of PVS. This study contributes to the understanding of caregiver positively valenced emotions and behaviors in association with everyday child positive emotion displays and child overall positive affect tendencies. Results suggest that *caregiver positively valenced emotions* in response to child emotion displays may influence child affect over a longer timescale and that *specific caregiver behaviors* in response to these displays, notably narration and joining child may have the greatest association with supporting child positive affect tendencies. Together, results emphasize that caregiver positive emotions and specific approach behaviors may be effective targets for interventions geared toward increasing child positive affect tendencies.

## ACKNOWLEDGMENTS

We are grateful to the participants who made this research possible, to Ms. Sarah Lempres for coordination of data collection for the parent project, and to Dr. Lauren Bailes for helpful feedback during the formative stages of developing this manuscript. This work was supported in part

by National Institutes of Health (UL1 TR000445 and T32 MH18921), the National Science Foundation (2042285), and Jacobs Foundation Early Career Research Fellowship (2017-1261-05).

## CONFLICT OF INTEREST STATEMENT

The authors report no conflict of interest.

## DATA AVAILABILITY STATEMENT

Deidentified data are available on OSF (<https://osf.io/4prgz/>).

## ORCID

Kaylin E. Hill  <https://orcid.org/0000-0002-2755-5327>

Autumn Kujawa  <https://orcid.org/0000-0002-0560-4589>

Kathryn L. Humphreys  <https://orcid.org/0000-0002-5715-6597>

## REFERENCES

- Aktar, E., & Bogels, S. M. (2017). Exposure to parents' negative emotions as a developmental pathway to the family aggregation of depression and anxiety in the first year of life. *Clinical Child and Family Psychology Review*, 20(4), 369–390. <https://doi.org/10.1007/s10567-017-0240-7>
- Behrendt, S. (2022). *lm.beta: Add standardized regression coefficients to lm-objects*. R package version 1.6-2. <https://CRAN.R-project.org/package=lm.beta>
- Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. Routledge. <https://doi.org/10.1192/S0007125000224197>
- Breaux, R., Lewis, J., Cash, A. R., Shroff, D. M., Burkhouse, K. L., & Kujawa, A. (2022). Parent emotion socialization and positive emotions in child and adolescent clinical samples: A systematic review and call to action. *Clinical Child and Family Psychology Review*, 25, 204–221. <https://doi.org/10.1007/s10567-022-00388-2>
- Bretherton, I., & Munholland, K. A. (1999). Internal working models in attachment relationships. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 89–111). The Guilford Press.
- Brown, C. E. (2006). *Social skills, emotion regulation, and emotion socialization in children with ADHD* [Doctoral dissertation, Long Island University, The Brooklyn Center]. Proquest Dissertations Publishing.
- Brown, C. L., Chen, K. H., Wells, J. L., Otero, M. C., Connelly, D. E., Levenson, R. W., & Fredrickson, B. L. (2022). Shared emotions in shared lives: Moments of co-experienced affect, more than individually experienced affect, linked to relationship quality. *Emotion*, 22(6), 1387–1393. <https://doi.org/10.1037/emo0000939>
- Brown, C. L., & Fredrickson, B. L. (2021). Characteristics and consequences of co-experienced positive affect: Understanding the origins of social skills, social bonds, and caring, healthy communities. *Current Opinion in Behavioral Sciences*, 39, 58–63. <https://doi.org/10.1016/j.cobeha.2021.02.002>
- Bylsma, L. M. (2021). Emotion context insensitivity in depression: Toward an integrated and contextualized approach. *Psychophysiology*, 58(2), e13715. <https://doi.org/10.1111/psyp.13715>
- Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*, 77(1), 44–58. <https://doi.org/10.1111/j.1467-8624.2006.00855.x>
- Dix, T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin*, 110(1), 3–25. <https://doi.org/10.1037/0033-2909.110.1.3>
- Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry*, 9(4), 241–273. [https://doi.org/10.1207/s15327965pli0904\\_1](https://doi.org/10.1207/s15327965pli0904_1)
- Eisenberg, N., Zhou, Q., Spinrad, T. L., Valiente, C., Fabes, R. A., & Liew, J. (2005). Relations among positive parenting, children's effortful control, and externalizing problems: A three-wave longitudinal study. *Child Development*, 76(5), 1055–1071. <https://doi.org/10.1111/j.1467-8624.2005.00897.x>
- Eyberg, S., & Funderburk, B. (2011). *Parent-child interaction therapy protocol*. PCIT International, Inc.
- Field, T., & Fogel, A. (Eds.). (1982). *Emotion and early interaction*. Psychology Press.
- Hajal, N. J., & Paley, B. (2020). Parental emotion and emotion regulation: A critical target of study for research and intervention to promote child emotion socialization. *Developmental Psychology*, 56(3), 403–417. <https://doi.org/10.1037/dev0000864>
- Halahakoon, D. C., Kieslich, K., O'Driscoll, C., Nair, A., Lewis, G., & Roiser, J. P. (2020). Reward-processing behavior in depressed participants relative to healthy volunteers: A systematic review and meta-analysis. *JAMA Psychiatry*, 77(12), 1286–1295. <https://doi.org/10.1001/jamapsychiatry.2020.2139>
- Hastings, P. D., & Kahle, S. (2019). Get bent into shape: The non-linear, multi-system, contextually-embedded psychophysiology of emotional development. In V. LoBue, K. Perez-Edgar, & K. Buss (Eds.), *Handbook of emotional development* (pp. 27–55). Springer. [https://doi.org/10.1007/978-3-030-17332-6\\_3](https://doi.org/10.1007/978-3-030-17332-6_3)
- Humphreys, K. L., & Lempres, S. M. (2021). Comfort, Attunement to, and Validation of Emotions Questionnaires (CAVE). <https://doi.org/10.17605/OSF.IO/58AEV>
- Jaffee, S. R., & Price, T. S. (2008). Genotype–environment correlations: implications for determining the relationship between environmental exposures and psychiatric illness. *Psychiatry*, 71(12), 496–499. <https://doi.org/10.1016/j.mppsy.2008.10.002>
- Johnson, A. M., Hawes, D. J., Eisenberg, N., Kohlhoff, J., & Dudeney, J. (2017). Emotion socialization and child conduct problems: A comprehensive review and meta-analysis. *Clinical Psychology Review*, 54, 65–80. <https://doi.org/10.1016/j.cpr.2017.04.001>
- Joiner, T. E., Catanzaro, S. J., & Laurent, J. (1996). Tripartite structure of positive and negative affect, depression, and anxiety in child and adolescent psychiatric psychology. *Journal of Abnormal Psychology*, 105(3), 401–409. <https://doi.org/10.1037/0021-843X.105.3.401>
- Keren, H., O'Callaghan, G., Vidal-Ribas, P., Buzzell, G. A., Brotman, M. A., Leibenluft, E., Pan, P. M., Meffert, L., Kaiser, A., Wolke, S., Pine, D. S., & Stringaris, A. (2018). Reward processing in depression: A conceptual and meta-analytic review across fMRI and EEG studies. *The American Journal of Psychiatry*, 175(11), 1111–1120. <https://doi.org/10.1176/appi.ajp.2018.17101124>
- Kessel, E. M., Kujawa, A., Goldstein, B., Hajcak, G., Bufferd, S. J., Dyson, M., & Klein, D. N. (2017). Behavioral observations of positive and negative valence systems in early childhood predict physiological measures of emotional processing three years later.

- Journal of Affective Disorders*, 216, 70–77. <https://doi.org/10.1016/j.jad.2016.10.044>
- King, L. S., Humphreys, K. L., & Gotlib, I. H. (2019). The neglect-enrichment continuum: Characterizing variation in early caregiving environments. *Developmental Review*, 51, 109–122. <https://doi.org/10.1016/j.dr.2019.01.001>
- King, L. S., Salo, V. C., Kujawa, A., & Humphreys, K. L. (2021). Advancing the RDoC initiative through the assessment of caregiver social processes. *Development and Psychopathology*, 33(5), 1648–1664. <https://doi.org/10.1017/S095457942100064X>
- Komsta, L., & Novomestky, F. (2022). moments: Moments, cumulants, skewness, kurtosis, and related tests (R package version 0.14.1). <https://CRAN.R-project.org/package=moments>
- Kujawa, A., Hajcak, G., Danzig, A. P., Black, S. R., Bromet, E. J., Carlson, G. A., Kotov, R., & Klein, D. N. (2016). Neural reactivity to emotional stimuli prospectively predicts the impact of a natural disaster on psychiatric symptoms in children. *Biological Psychiatry*, 80(5), 381–389. <https://doi.org/10.1016/j.biopsych.2015.09.008>
- Kujawa, A., Klein, D. N., Pegg, S., & Weinberg, A. (2020). Developmental trajectories to reduced activation of positive valence systems: A review of biological and environmental contributions. *Developmental Cognitive Neuroscience*, 43, 100791. <https://doi.org/10.1016/j.dcn.2020.100791>
- Le, B. M., & Impett, E. A. (2016). The costs of suppressing negative emotions and amplifying positive emotions during parental caregiving. *Personality and Social Psychology Bulletin*, 42(3), 323–336. <https://doi.org/10.1177/0146167216629122>
- Leerkes, E. M. (2010). Predictors of maternal sensitivity to infant distress. *Parenting: Science and Practice*, 10(3), 219–239. <https://doi.org/10.1080/15295190903290840>
- Leerkes, E. M., & Augustine, M. E. (2019). Parenting and emotions. In M. H. Bornstein (Ed.), *Handbook of parenting: Being and becoming a parent* (pp. 620–653). Routledge/Taylor & Francis Group. <https://doi.org/10.4324/9780429433214-18>
- Leerkes, E. M., & Bailes, L. G. (2019). Emotional development within the family context. In B. LoBue, K. Perez-Edgar, & K. Buss (Eds.), *Handbook of emotional development* (pp. 627–651). Springer. <https://doi.org/10.1007/978-3-030-17332-6>
- Lempres, S., & Humphreys, K. L. (2021). Frequency of Emotions Questionnaire (FEQ). <https://doi.org/10.17605/OSF.IO/9M5H8>
- Luebke, A. M., Kiel, E. J., & Buss, K. A. (2011). Brief report: Toddlers' context-varying emotions, maternal responses to emotions, and internalizing behaviors. *Emotion*, 11(3), 697–703. <https://doi.org/10.1037/a0022994>
- Luyten, P., & Fonagy, P. (2018). The stress-reward-mentalizing model of depression: An integrative developmental cascade approach to child and adolescent depressive disorder based on the Research Domain Criteria (RDoC) approach. *Clinical Psychology Review*, 64, 87–98. <https://doi.org/10.1016/j.cpr.2017.09.008>
- Mangelsdorf, S. C., Schoppe, S. J., & Buur, H. (2000). The meaning of parental reports: A contextual approach to the study of temperament and behavior problems in childhood. In V. J. Molfese, D. L. Molfese, & R. R. McCrae (Eds.), *Temperament and personality development across the lifespan* (pp. 121–140). Psychology Press. <https://doi.org/10.4324/9781410604873>
- McNeil, C., & Hembree-Kigin, T. (2010). *Parent-child interaction therapy* (2nd ed.). Springer.
- Medeiros, G. C., Rush, A. J., Jha, M., Carmody, T., Furman, J. L., Czysz, A. H., Trombello, J. M., Cooper, C. M., & Trivedi, M. H. (2020). Positive and negative valence systems in major depression have distinct clinical features, response to antidepressants, and relationships with immunomarkers. *Depression and Anxiety*, 37(8), 771–783. <https://doi.org/10.1002/da.23006>
- Miller, L. E., Perkins, K. A., Dai, Y. G., & Fein, D. A. (2017). Comparison of parent report and direct assessment of child skills in toddlers. *Research in Autism Spectrum Disorders*, 41–42, 57–65. <https://doi.org/10.1016/j.rasd.2017.08.002>
- Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, 16(2), 361–388. <https://doi.org/10.1111/j.1467-9507.2007.00389.x>
- National Institute of Mental Health. (2022). *RDoC Matrix*. <https://www.nimh.nih.gov/research/research-funded-by-nimh/rdoc/constructs/rdoc-matrix>
- Nelson, E. E., Jarcho, J. M., & Guyer, A. E. (2016). Social reorientation and brain development: An expanded and updated view. *Developmental Cognitive Neuroscience*, 17, 118–127. <https://doi.org/10.1016/j.dcn.2015.12.008>
- Olino, T. M. (2016). Future research directions in the positive valence systems: Measurement, development, and implications for youth unipolar depression. *Journal of Clinical Child & Adolescent Psychology*, 45(5), 681–705. <https://doi.org/10.1080/15374416.2015.1118694>
- Oppenheim, D. (2006). Child, parent, and parent-child emotion narratives: Implications for developmental psychopathology. *Development and Psychopathology*, 18(3), 771–790. <https://doi.org/10.1017/S095457940606038X>
- Pettit, G. S., & Arsiwalla, D. D. (2008). Commentary on special section on “Bidirectional parent-child relationships”: The continuing evolution of dynamic, transactional models of parenting and youth behavior problems. *Journal of Abnormal Child Psychology*, 36(5), 711–718. <https://doi.org/10.1007/s10802-008-9242-8>
- Proudfit, G. H., Bress, J. N., Foti, D., Kujawa, A., & Klein, D. N. (2015). Depression and event-related potentials: Emotional disengagement and reward insensitivity. *Current Opinion in Psychology*, 4, 110–113. <https://doi.org/10.1016/j.copsyc.2014.12.018>
- R Core Team. (2022). *R: A Language and environment for statistical computing*. R Foundation for Statistical Computing.
- Ramakrishnan, J. L., Garside, R. B., Labella, M. H., & Klimes-Dougan, B. (2019). Parent socialization of positive and negative emotions: Implications for emotional functioning, life satisfaction, and distress. *Journal of Child and Family Studies*, 28, 3455–3466. <https://doi.org/10.1007/s10826-019-01528-z>
- Rueger, S. Y., Katz, R. L., Risser, H. J., & Lovejoy, M. C. (2011). Relations between parental affect and parenting behaviors: A meta-analytic review. *Parenting: Science and Practice*, 11(1), 1–33. <https://doi.org/10.1080/15295192.2011.539503>
- Rutherford, H. J. V., Wallace, N. S., Laurent, H. K., & Mayes, L. C. (2015). Emotion regulation in parenthood. *Developmental Review*, 36, 1–15. <https://doi.org/10.1016/j.dr.2014.12.008>
- Saudino, K. J. (2005). Behavioral genetics and child temperament. *Journal of Developmental and Behavioral Pediatrics*, 26(3), 214–223. <https://doi.org/10.1097/00004703-200506000-00010>
- Saudino, K. J., & Micalizzi, L. (2015). Emerging trends in behavioral genetic studies of child temperament. *Child Development Perspectives*, 9(3), 144–148. <https://doi.org/10.1111/cdep.12123>

- Schwartz, O. S., Sheeber, L. B., Dudgeon, P., & Allen, N. B. (2012). Emotion socialization within the family environment and adolescent depression. *Clinical Psychology Review, 32*(6), 447–453. <https://doi.org/10.1016/j.cpr.2012.05.002>
- Taylor, C. T., Pearlstein, S. L., & Stein, M. B. (2020). A tale of two systems: Testing a positive and negative valence systems framework to understand social disconnection across anxiety and depressive disorders. *Journal of Affective Disorders, 266*, 207–214. <https://doi.org/10.1016/j.jad.2020.01.041>
- Troutman, B. (2015a). *Integrating behaviorism and attachment theory in parent coaching*. Springer. <https://doi.org/10.1007/978-3-319-15239-4>
- Troutman, B. (2015b). Viewing parent–child interactions through the lens of behaviorism. In *Integrating behaviorism and attachment theory in parent coaching* (pp. 3–21). Springer. <https://doi.org/10.1007/978-3-319-15239-4>
- Troutman, B. (2015c). Viewing parent–child interactions through the lens of attachment theory. In *Integrating behaviorism and attachment theory in parent coaching* (pp. 21–43). Springer. <https://doi.org/10.1007/978-3-319-15239-4>
- Tsai, J. L. (2007). Ideal affect: cultural causes and behavioral consequences. *Perspectives on Psychological Science, 2*(3), 242–259. <https://doi.org/10.1111/j.1745-6916.2007.00043.x>
- Tsai, J. L. (2017). Ideal affect in daily life: implications for affective experience, health, and social behavior. *Current Opinion in Psychology, 17*, 118–128. <https://doi.org/10.1016/j.copsyc.2017.07.004>
- Urquiza, A., Zebell, N., McGrath, J., & Whitten, L. (2011). *Course of treatment manual for PCIT-TC*. University of California at Davis.
- Zeileis, A. (2004). Econometric computing with HC and HAC covariance matrix estimators. *Journal of Statistical Software, 11*(10), 1–17. <https://doi.org/10.18637/jss.v011.i10>
- Zeileis, A., & Hothorn, T. (2002). Diagnostic checking in regression relationships. *R News, 2*(3), 7–10. <https://www.r-project.org/doc/Rnews/index.html>

**How to cite this article:** Hill, K. E., Kujawa, A., & Humphreys, K. L. (2023). Caregivers' positive emotion socialization tendencies are associated with positive affect in preschool age children. *Infant Mental Health Journal, 44*, 437–447. <https://doi.org/10.1002/imhj.22036>