

The Costs of Suppressing Negative Emotions and Amplifying Positive Emotions During Parental Caregiving

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Abstract

How do parents feel when they regulate their emotional expressions in ways that are incongruent with their genuine feelings? In an experimental study, parents reported experiencing lower authenticity, emotional well-being, relationship quality, and responsiveness to their children's needs when they recalled caregiving experiences in which they suppressed negative emotions and amplified positive emotions, relative to a control condition. In a 10-day daily experience study, parents tended to use both regulation strategies simultaneously. In addition, assessing their unique effects indicated that positive emotion amplification, but not negative emotion suppression, had an indirect effect on parental outcomes via authenticity, with negative emotion suppression no longer being costly. This indirect effect was dampened when accounting for care difficulty. In both studies, effects were independent of a child's mood. The current results suggest that parents' attempts to suppress negative and amplify positive emotions during child care can detract from their well-being and high-quality parent-child bonds.

Keywords

close relationships, emotion regulation, parenting, authenticity, well-being

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Parenting can be incredibly meaningful and joyful, yet it can also be difficult and emotionally demanding (Nelson, Kushlev, & Lyubomirsky, 2014). The emotions that parents experience can range from joy and pride from watching their child develop and grow, to frustration and anger when catching their child in an act of disobedience. In these situations, parents may experience emotions that are incongruent with the emotions they wish to express to their children and may attempt to regulate the expression of their emotions. For instance, a mother may inhibit the expression of anger when her son misbehaves in public so she can discipline him more constructively at a later time. In another scenario, a father may express more excitement than he actually feels during his daughter's piano recital to signal his approval of her performance and dedication to playing the piano.

In the current investigation, we focus on two emotion regulation strategies parents may use when caring for their children. First, given that parents might feel that expressing negative emotions could upset their children or be socially undesirable, we examined the extent to which parents engage in *negative emotion suppression* by inhibiting their outward expression of negative emotions (Gross & John, 2003). Second, given that parents may at times want to provide positive feedback to their children even when they do not genuinely feel positively, we also examined the extent to which

parents engage in *positive emotion amplification* by exaggerating, and in this investigation, by feigning, their outward expression of positive emotions (Côté & Morgan, 2002).

A focus on parental negative emotion suppression and positive emotion amplification is particularly important given that positive and negative emotions can serve unique purposes for parents and result in unique consequences for both parents and children. Negative emotion expression has been theorized to obstruct effective parenting by prompting insensitive or controlling behaviors (Dix, 1991) and can even, in some cases, increase the likelihood of physical violence toward children (Mammen, Kolko, & Pilkonis, 2002; Mammen, Pilkonis, Kolko, & Groff, 2007). Parental negative emotion expression has also been linked with poorer outcomes for children, including more internalization problems (Robinson et al., 2009), although it is unclear whether it hinders or facilitates children's own emotion regulation and

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social development over the long term (Bariola, Gullone, & Hughes, 2011; Eisenberg et al., 2003). Parental positive emotion expression, on the contrary, has been consistently associated with positive outcomes, including more responsive parenting (Dix, 1991) and greater social competence and emotion regulation in children (Bariola et al., 2011). Furthermore, it may allow parents to signal warmth and affiliation to their children (Harker & Keltner, 2001).

Given that expressing negative emotions is linked with negative outcomes whereas positive emotion expression is linked with positive outcomes, parents may be motivated to suppress negative and amplify positive emotions with their children. In the current investigation, we sought to understand how these emotion regulation strategies affect parents during caregiving. Specifically, we tested how parents' use of these emotion regulation strategies shapes their feelings of authenticity, emotional well-being, relationship quality with their child, and feelings of responsiveness to their child's needs.

The Consequences of Emotional Suppression

While parental emotion expression has been widely studied, comparatively less research has examined parental emotion regulation and its consequences (Dix, 1991). A few studies, however, provide insight into the consequences of suppressing negative emotions in particular. One study examined negative emotion suppression in depressed, recently divorced and divorcing, mothers of 5- to 11-year-olds. Results of in-home observations indicated that mothers with higher self-reported depression symptoms tended to suppress negative emotions with their children if their children were high in negative reactivity and displayed minimal aversive behaviors (Dix, Moed, & Anderson, 2014). In research on nondistressed samples of mother and adult child dyads, mothers who tended to suppress the anger they felt toward their children, relative to mothers who did so less, experienced lower parent-child relationship quality (Martini & Busseri, 2012). However, maternal anger suppression did not predict their child's relationship quality, suggesting that suppression may be more costly for parents than for their children. Consistent with the idea that parental suppression may not always be harmful for children, another study indicated that, under some circumstances, parental suppression might promote more effective discipline with younger children. Specifically, mothers who reported suppressing their emotions when disciplining their toddlers were less overreactive relative to mothers who engaged in less suppression (Lorber, 2012).

Research on adult close relationships has documented similar costs of suppression (English, John, & Gross 2013). Suppression has been linked with personal costs, including lower emotional well-being and self-esteem (Gross & John, 2003; Impett et al., 2012; Nezlek & Kuppens, 2008). In addition, suppression can be interpersonally costly across a

variety of social relationships, detracting from interpersonal closeness, relationship satisfaction, and social support (Butler et al., 2003; English, & John, 2013; Gross & John, 2003; Impett et al., 2012; Srivastava, Tamir, McGonigal, John, & Gross, 2009; Stroebe et al., 2013). Suppression has also been found to compromise responsiveness to others. In a laboratory study, women experimentally induced to suppress their emotions, relative to those who were not instructed to do so, were rated by outside observers as less responsive (Butler et al., 2003). Engaging in suppression is effortful and taxing, and we expected, consistent with previous research (English et al., 2013), that using this strategy could compromise parents' resources for, or abilities to, respond to their child's needs.

The Consequences of Emotional Amplification

While research on close relationships provides insight into how suppressing negative emotions may affect parents, much less research has focused on how parents regulate positive emotions when caring for their children (Dix, 1991). To our knowledge, no research has examined positive emotion amplification in close relationships more generally, or in the parent-child relationship specifically. However, parents might be motivated to express more positive emotions to their children than they feel for many reasons. For instance, parents may do so when they seek to reassure their children in times of need or to provide them with positive feedback, perhaps during times when they feel tired, underwhelmed, or bored. In addition, given that capitalization—or how people respond to a relationship partner's good events (Gable, Reis, Impett, & Asher, 2004)—is vital to positive relationship functioning, parents may react to a child's positive events in a joyful and supportive way to promote closeness and satisfaction in their relationship, despite not genuinely feeling these emotions.

Expressing positive emotions can promote positive outcomes for parents in additional ways. For instance, positive emotion expression may allow parents to signal warmth and promote affiliation (Harker & Keltner, 2001), to show responsiveness to their child's needs (Dix, 1991), and to promote their child's social competence and emotion regulation (Bariola et al., 2011). In addition, positive emotions may help parents achieve desired outcomes with children. For instance, positive behaviors such as praise have been theorized to promote child compliance when paired with other positive forms of reinforcement, such as emotional cues of warmth, material or symbolic rewards, and earned privileges (Owen, Slep, & Heyman, 2012).

While research on parental positive emotion amplification is lacking, findings on emotional amplification in other contexts provide insight into its consequences. For instance, undergraduate students who report heightened abilities to intensify, harness, and prolong their emotions—strategies

that collectively tap emotion amplification—also report feeling more positive emotions and fatigue, but no differences in negative emotions and depression relative to those who reported lower emotion amplification abilities (Hamilton et al., 2009). Furthermore, those who report a greater ability to amplify emotions relative to others also report greater abilities to reduce emotions by softening, shortening, or stopping their emotional experiences altogether, suggesting that those who regulate their emotions with one strategy are also more likely to use other emotion regulation strategies.

Given that people who work in teams and service industries have jobs that necessitate being pleasant to others, it is perhaps unsurprising that emotional amplification has commonly been studied in the workplace (Côté & Morgan, 2002; Grandey, 2000; Grandey & Gabriel, 2015). Results from a meta-analysis indicate that surface acting—a strategy utilized when emotions have already been elicited and are outwardly managed through suppressing, exaggerating, or faking emotional expression—substantially predicts impaired well-being (Hülshager & Schewe, 2011). In contrast, deep acting—a strategy utilized at the onset of emotions when people attempt to align true feelings with required feelings through redirection of attention and reappraisal—only weakly predicts impaired well-being. This research indicates that people experience the greatest costs when amplifying emotions in ways that are superficial and misaligned with what they genuinely feel or want to feel.

Emotion Regulation and Authenticity

One reason why suppression detracts from well-being is because the act of inhibiting one's true emotions decreases people's sense of authenticity (English & John, 2013; Gross & John, 2003; Impett et al. 2012; Impett, Le, Kogan, Oveis, & Keltner, 2014). *Authenticity*, or the feeling that one is operating according to one's true or core sense of self (Kernis & Goldman, 2006; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997), is a crucial component of both personal and relationship well-being. For instance, lower authenticity experienced from suppressing emotions predicts reduced personal well-being and lower quality relationships generally (Brunell et al., 2010; English & John, 2013; Gross & John, 2003; Kernis & Goldman, 2006; Sheldon et al., 1997) and in the context of providing care in romantic relationships (Impett et al., 2012; Kogan et al., 2010; Le & Impett, 2013).

To our knowledge, research has yet to directly examine whether engaging in emotion amplification detracts from authenticity. However, studies on surface acting suggest that amplifying emotions is costly insofar as people feel inauthentic. Results from one study indicated that when patients mistreat health care providers, these providers tend to engage in surface acting, which in turn contributes to greater burnout, but only in cases in which providers felt they could not be authentic with coworkers (Grandey, Foo, Groth, & Goodwin, 2012). In addition, authentic, rather than inauthentic, displays

of positive emotions by service workers predict better relational outcomes in the form of greater perceived friendliness (Grandey, Fisk, Mattila, Jansen, & Sideman, 2005).

In the parent-child relationship, a parent's sense of authenticity is likely highly intertwined with being responsive to their child's needs. When parents suppress negative and amplify positive emotions, not only might they experience lower authenticity given the disconnect between their emotional experience and expression, but these acts could also compromise their feelings of responsiveness. Specifically, prosocial behaviors may be best promoted when intrinsic and extrinsic feelings align (Ryan, Huta, & Deci, 2008), and, thus, a genuine regard for a child's needs likely comes from expressing genuinely felt emotions. For example, responding to a child's mistake with authentic, true feelings of concern rather than by begrudgingly inhibiting frustration likely results in higher quality caregiving. Similarly, authentically expressing happiness for a child's accomplishments likely results in more effective positive feedback relative to expressing happiness in a feigned or disingenuous manner.

The Current Studies

The current studies examined how parental negative emotion suppression and positive emotion amplification may shape parents' personal and relationship well-being. In an experimental study (Study 1) and a naturalistic 10-day experience sampling study (Study 2), we first tested the hypotheses that parents experience lower well-being, relationship quality, and responsiveness to their child's needs when they suppress negative emotions and amplify positive emotions. Second, we tested whether parents experience these costs because they feel less authentic when suppressing negative and amplifying positive emotions.

Across both studies, we also tested whether the extent to which parents find caregiving to be challenging might impact the consequences of parental negative emotion suppression and positive emotion amplification. We expected that parents would be more likely to engage in these emotion regulation strategies when caregiving is difficult and their child is in a poor mood, given these are conditions in which desired and actual emotions are most likely to be misaligned, and when parents may be most likely to experience lower well-being (Bryan & Dix, 2009; Cutrona & Troutman, 1986; Dix et al., 2014; Laukkanen, Ojansuu, Tolvanen, Alatupa, & Aunola, 2014). Thus, we sought to rule out the possibility that care difficulty and child's mood could explain why parents suppress negative and amplify positive emotions and experience associated costs. In addition, we sought to test whether care difficulty and child mood substantially change (i.e., moderate) the costs of engaging in each emotion regulation strategy given that the negativity parents feel has been linked to differential outcomes of regulating emotions with children (Dix et al., 2014). Finally, we capitalized on the ecological

validity of our daily experience design to qualitatively code caregiving behaviors and test how these different behaviors might impact the link between each of the emotion regulation strategies and parental outcomes.

Study 1

Study 1 provides an experimental test of our prediction that suppressing negative emotions and amplifying positive emotions would be costly for parents. We predicted that parents would report feeling lower authenticity, emotional well-being, relationship quality, and responsiveness to their child's needs when they suppress negative and amplify positive emotions relative to times when they do not report regulating their emotions.

Method

Participants and procedure. We recruited a sample of 195 parents of children between the ages of 4 and 12 years old from Amazon's Mechanical Turk. After excluding 20 parents who failed an attention check, one parent who wrote off topic for a free response question, six parents who stated they never suppress negative emotions, and six parents who stated they never amplify positive emotions, the final sample consisted of 162 parents who completed all three conditions described below.¹ If parents had more than one child between 4 and 12 years old, they were prompted to report on their child who had the most recent birthday to avoid selection biases (Brummelman, Thomaes, Nelemans, Orobio de Castro, & Bushman, 2015). Parents were 35 years old on average ($SD = 7$, range = 21-59) with an equal number of mothers (50%) and fathers (50%) who were mostly married (83%). Parents were 73% Caucasian, 8% African, 4% Asian, 4% Other, 3% Middle Eastern, 2% Hispanic, and 6% were mixed race/multiple origin or of another race. Parents reported on children who were 7 years old on average ($SD = 3$, range = 3-12)² with 46% girls and 54% boys.

The study was a within-person design administered completely online. All parents recalled three caregiving experiences that occurred within the last 4 weeks to ensure that all parents recalled experiences during a similar time frame (Niven, Macdonald, & Holman, 2012). In the first recalled caregiving experience, which served as a *control condition*, parents were not explicitly prompted to describe any type of emotion regulation. Parents described, in a free response format, (a) what they did for their child, (b) the emotions they felt, and (c) how they behaved toward their children.

Next, parents completed two experimental conditions presented in a randomized order. In the *negative emotion suppression condition*, parents were asked to "recall a time that you felt negative emotions—such as anger, frustration, or resentment—yet you withheld your outward expression of these emotions to your child." Following this prompt, and based on previous research (Gross & John, 2003), parents

described, in a free response format, (a) what they did for their child, (b) the negative emotions they felt, and (c) how they withheld the outward expression of negative emotions they felt toward their child. In the *positive emotion amplification condition*, parents were asked to "recall a time in which you felt no, or very little, positive emotions such as happiness and joy—yet you outwardly expressed these emotions to your child despite not feeling them." Next, based on previous research (Côté & Morgan, 2002), parents described, in free response format, (a) what they did for their child; (b) why they felt no, or very little, positive emotions; and (c) how they expressed positive emotions to their child despite not feeling them. All parents completed all three conditions, yielding 486 within-person observations.

After each of the three conditions, parents reported on the following, all rated on 7-point scales. *Authenticity* was assessed with the item "How authentic (true to yourself) did you feel while giving care to your child in this situation?" (Impett et al., 2012; Le & Impett, 2013). Parents also rated other outcomes during caregiving, all drawn from Le and Impett (2015). *Emotional well-being* was assessed with items measuring *positive emotions* (e.g., "happy, pleased, joyful") and *negative emotions* (e.g., "bad, frustrated, irritated"). *Relationship quality* was assessed with items tapping *satisfaction* ("How satisfied did you feel with your relationship with your child in this situation?") and *conflict* ("How much conflict did you experience with your child in this situation?"). Given that results were consistent across individual indicators of emotional well-being and relationship quality, and to reduce the total number of estimates computed, we created composites for emotional well-being (ρ s ranged from .53 to .60) and relationship quality (ρ s ranged from .31 to .40) after reverse scoring the negative emotion and conflict items, respectively. *Responsiveness* was assessed with the item "How much did you meet your child's needs in this situation?" *Care difficulty* was assessed with the item "How easy versus difficult was it to give care to your child in this situation?" and *child's mood* was assessed with the item "What was your child's mood while you gave care to him or her in this situation?" Last, two *manipulation check* items were administered: "How much did you withhold expressing the negative emotions you felt to your child in this situation?" and "How much did you express positive emotions to your child even though you felt no, or very little, positive emotions in this situation?"

Results

We conducted multilevel modeling analyses using Mplus v. 7.0 (Muthén & Muthén, 1998-2012) to account for the dependencies associated with each parent recalling three caregiving experiences. In all models, we allowed intercepts to vary, used robust standard errors to account for nonnormality, and correlated errors for all simultaneous outcomes to account for nonindependence among criteria. For our hypotheses, we tested the extent

to which the negative emotion suppression and positive emotion amplification conditions were associated with lower authenticity, emotional well-being, relationship quality, and responsiveness, relative to the control condition. Thus, for our primary analyses, we created dummy codes for each of the experimental emotion regulation conditions (with the key condition coded as 1 and the other conditions coded as 0), allowing the control condition to serve as the baseline comparison condition. Both codes were entered as simultaneous predictors in all models. Estimates are unstandardized multilevel coefficients with corresponding 95% confidence intervals. Although we did not compute a priori power analyses, our sample size exceeds multilevel power simulations of detecting a medium sized effect at 65% power, which would require an average of three observations within 40 participants (current study: three observations within 162 participants; Scherbaum & Ferrer, 2009). Estimates are presented with their 95% confidence intervals in brackets.

First, we found that the experimental manipulations were successful. Parents reported significantly higher mean levels of negative emotion suppression in the negative emotion suppression condition ($M = 5.40$, $SD = 1.59$) relative to the control condition ($M = 3.93$, $SD = 2.21$), $b = 1.47$ [1.11, 1.83], $p < .001$. Likewise, parents reported significantly higher mean levels of positive emotion amplification in the positive emotion amplification condition ($M = 5.60$, $SD = 1.49$) relative to the control condition ($M = 5.19$, $SD = 1.79$), $b = 0.40$ [0.09, 0.71], $p = .01$.

Next, and consistent with hypotheses, when parents recalled a caregiving experience in which they suppressed negative emotions, they reported feeling lower authenticity ($b = -1.37$ [-1.63, -1.11], $p < .001$), emotional well-being ($b = -2.36$ [-2.67, -2.04], $p < .001$), relationship quality ($b = -1.85$ [-2.11, -1.59], $p < .001$), and responsiveness ($b = -1.22$ [-1.49, -0.95], $p < .001$) relative to when they recalled a caregiving experience in the control condition. Also as expected, relative to the control condition, when parents recalled a caregiving experience in which they amplified positive emotions, they reported experiencing lower authenticity ($b = -2.14$ [-2.46, -1.81], $p < .001$), emotional well-being ($b = -1.52$ [-1.84, -1.20], $p < .001$), relationship quality ($b = -0.90$ [-1.13, -0.67], $p < .001$), and responsiveness ($b = -0.73$ [-0.96, -0.50], $p < .001$). Thus, suppressing negative and amplifying positive emotions were both costly during caregiving. All condition means and standard deviations are shown in Table 1.

Next, we sought to determine whether the challenging nature of care could account for the costs of suppressing negative and amplifying positive emotions. This was important given that parents indicated that care was more difficult to provide in both the negative emotion suppression ($b = 1.94$ [1.56, 2.31], $p < .001$) and positive emotion amplification ($b = 1.27$ [0.92, 1.62], $p < .001$) conditions relative to the control condition. In addition, parents indicated that their child was in a worse mood in the negative emotion suppression condition ($b = 1.03$ [0.68, 1.38], $p < .001$), but not the

Table 1. Experimental Condition Means and Standard Deviations in Study 1.

Outcome	Condition		
	Control	Negative emotion suppression	Positive emotion amplification
Authenticity	6.54 (0.79)	5.16 (1.62)	4.40 (1.93)
Emotional well-being	5.07 (1.68)	2.70 (1.57)	3.55 (1.67)
Relationship quality	6.11 (1.11)	4.27 (1.39)	5.20 (1.32)
Responsiveness	6.42 (0.96)	5.20 (1.55)	5.69 (1.37)
Care difficulty	2.55 (1.75)	4.49 (1.73)	3.83 (1.86)
Child mood	3.32 (1.85)	4.35 (1.83)	3.08 (1.99)

Note. Estimates represent condition means and standard deviations (inside parentheses).

positive emotion amplification condition ($b = -0.24$ [-0.63, 0.14], $p = .21$), relative to the control condition.

To this end, we retested our hypotheses while controlling for care difficulty and child's mood as separate covariates. After controlling for care difficulty, all previously reported effects for negative emotion suppression (bs ranging from -1.71 to -0.90, all $ps < .001$) and positive emotion amplification (bs ranging from -2.00 to -0.43, all $ps < .001$) remained significant. In addition, after controlling for child's mood, all previously reported effects for negative emotion suppression (bs ranging from -2.09 to -1.06, all $ps < .001$) and positive emotion amplification (bs ranging from -2.11 to -0.77, all $ps < .001$) remained significant. Furthermore, care difficulty and child's mood did not substantially change the magnitude of the association between suppressing negative and amplifying positive emotions in predicting parenting outcomes. Specifically, only four of 16 interactions between the two emotion regulation strategies with care difficulty (in one set of models) and child's mood (in another set of models) reached significance (see Table S1 in the online supplement for detailed results). Thus, results indicated that suppressing negative and amplifying positive emotions was by and large costly for parents regardless of the challenging nature of care.³

Study 2

We next conducted a 10-day daily experience study to capture multiple caregiving experiences within-person to allow us to assess parental emotion regulation and associated outcomes with greater ecological validity, greater reliability, and minimized retrospective biases (Bolger, Davis, & Rafaeli, 2003). Here, we examined whether daily increases in negative emotion suppression and positive emotion amplification would predict corresponding drops in emotional well-being, relationship quality, and responsiveness due to parents feeling less authentic when engaging in these two emotion regulation strategies.

Method

Participants and procedure. A community sample of 118 parents reported on a child selected based on their age and who had previously participated in a study on child development at the university. This feature of the design minimized the likelihood that parents reported on a particular child of their choice (e.g., their favorite child; Sutor, Sechrist, Plikuhn, Pardo, & Pillemer, 2008). Parents were 42 years old on average ($SD = 5$, range = 29-53) with most being married (93%). Parents were 80% mothers and 18% fathers (2% did not state), and 47% Caucasian, 16% Asian, 14% Other, 9% mixed race/multiple origins, 4% Latino, 3% Caribbean, 2% African, and 5% not stated. Parents reported on children who were 7 years old on average⁴ ($SD = 3$, range = 3-12), with 51% girls, 48% boys, and 1% not stated.

After completing a background survey with demographic and personality measures, parents completed a short “daily diary” survey online each day for 10 consecutive days. On average, parents completed 6.17 out of 10 diaries ($SD = 2.5$), yielding 728 diaries in total. Compliance was acceptable, with parents completing the following number of diaries: 52% completing seven or more diaries, 20% completing four to six diaries, and 18% completing three or fewer diaries. Parents were compensated with CAD\$40 and entered in a raffle for a family pass to a community science center.

Measures. Each day, parents provided free response answers to an open-ended question regarding a *daily caregiving experience*:

People give care to their children in both good and bad times. Sometimes giving this care is easy and enjoyable whereas other times it is difficult and frustrating. Please describe a time today, be it easy or difficult, when you gave care to your child. Please describe what your child was going through and what you did for your child.

This question was designed to minimize socially desirable responses by emphasizing that caregiving includes both positive and negative experiences. Parents then completed measures regarding how they felt while providing care for their child, all on 7-point scales. *Negative emotion suppression* was assessed with an item from the *Emotion Regulation Questionnaire* (Gross & John, 2003): “When I was feeling negative emotions, I was careful not to express them” ($M = 3.09$, $SD = 2.07$). *Positive emotion amplification* was assessed with a face-valid item consistent with research by Côté and Morgan (2002): “I expressed positive emotions to my child even though I did not actually feel happy” ($M = 2.74$, $SD = 2.02$). Parents also reported on their *authenticity* ($M = 6.22$, $SD = 1.05$) with the same item used in Study 1.

Emotional well-being ($M = 5.60$, $SD = 1.18$) during caregiving was assessed with four *positive emotion* clusters (“happy, pleased, joyful”; “affectionate, loving, caring”; “grateful, appreciative, thankful”; “cared about, loved,

connected”) and four *negative emotion* clusters (“sad, depressed, down”; “resentful toward my child”; “lonely, isolated”; “angry, irritable, frustrated”; Impett et al., 2012; Srivastava et al., 2009). *Relationship quality* ($M = 5.39$, $SD = 1.10$) was measured with three items tapping *satisfaction* (“How satisfied did you feel with your relationship with your child in general today?”), *conflict* (“How much conflict did you have with your child in general today?”), and *closeness* (the one-item Inclusion of Other in Self measure; Aron, Aron, & Smollan, 1992). As described in Study 1, composites of emotional well-being ($\alpha = .87$) and relationship quality ($\alpha = .62$) were created given the consistency of results across each outcome. *Responsiveness* ($M = 6.00$, $SD = 1.19$) was measured with the item “To what extent do you think you met your child’s needs in this situation?” *Care difficulty* ($M = 2.64$, $SD = 1.81$) and *child’s mood* ($M = 3.19$, $SD = 1.91$) were assessed with the same items as in Study 1.

Last, we qualitatively identified common *caregiving behavior* themes parents described in response to the daily caregiving experience prompt, followed by quantitatively coding each experience based on these themes. Specifically, the authors, along with one research assistant, identified unique caregiving behaviors parents reported through thematic analysis and came to consensus on the primary themes that emerged (Braun & Clarke, 2006). Next, two independent raters coded all daily caregiving experiences based on the four themes identified: *routine and basic needs* ($k = 0.72$; 39% of responses); *enrichment and recreational activities* ($k = 0.68$; 24% of responses); *advice, comfort, and encouragement* ($k = 0.58$; 18% of responses); *control and discipline* ($k = 0.72$; 14% of responses); and an *other* category ($k = 0.80$; 5% of responses). Once initial kappas were in an acceptable range, the first author resolved any discrepancies between coders. All behavioral codes were completed prior to hypothesis testing.

Results

Given the structure of our data, with diaries (Level 1) nested within parents (Level 2), we conducted multilevel modeling. We tested a “1-1-1” multilevel mediation model (Zhang, Zyphur, & Preacher, 2009) with authenticity as a mediator of the associations between both emotion regulation strategies and measures of daily well-being, relationship quality, and responsiveness to a child’s needs. We estimated both person-mean centered Level 1 and aggregated, grand mean centered Level 2 effects for all predictors to unconfound within- and between-person effects. Given our interest in within-person variation, we report person-mean centered, within-person effects, which reflect variations in all variables on a given day from a parent’s 10-day average of that variable. Although we did not compute a priori power analyses, our sample size exceeds multilevel power simulations for detecting a medium sized effect at 80% power, which would require an average of six observations within 40 participants (current study: six

observations within 118 participants; Scherbaum & Ferreter, 2009).

Independent effects of each emotion regulation strategy. We first tested whether each regulation strategy independently predicted daily parenting outcomes. Replicating the results of Study 1, on days when parents suppressed negative emotions during caregiving more than they did on average across the 10-day study, they experienced lower authenticity ($b = -0.07 [-0.13, -0.02], p = .01$), emotional well-being ($b = -0.11 [-0.17, -0.06], p < .001$), relationship quality ($b = -0.09 [-0.13, -0.06], p < .001$), and responsiveness to their child's needs ($b = -0.06 [-0.13, -0.002], p = .04$). Furthermore, and as indicated by the significant indirect effects reported in Table 2, authenticity significantly mediated the associations between suppressing negative emotions and emotional well-being, relationship quality, and responsiveness. In this model, the associations between negative emotion suppression and emotional well-being (*direct effect*: $b = -0.08 [-0.12, -0.03], p = .002$), relationship quality (*direct effect*: $b = -0.06 [-0.10, -0.03], p = .001$) but not responsiveness (*direct effect*: $b = -0.02 [-0.06, 0.03], p = .51$) remained significant, indicating that authenticity partially explained the associations between negative emotion suppression with well-being and relationship quality, and fully accounted for the link with responsiveness.

Also replicating results of Study 1, on days when parents amplified positive emotions more than they did on average across the 10-day study, they experienced significantly less authenticity ($b = -0.12 [-0.17, -0.07], p < .001$), emotional well-being ($b = -0.18 [-0.25, -0.11], p < .001$), relationship quality ($b = -0.14 [-0.19, -0.08], p < .001$), and responsiveness ($b = -0.14 [-0.19, -0.07], p < .001$). Furthermore, and as indicated by the significant indirect effects reported in Table 2, authenticity significantly mediated the associations between amplifying positive emotions and emotional well-being, relationship quality, and responsiveness. In this model, the links between positive emotion amplification and all outcomes remained significant (direct effect *bs* ranging from -0.12 to -0.06 and $ps \leq .03$), indicating that authenticity only partially explained the associations between positive emotion amplification and daily costs.

The unique effects of each emotion regulation strategy. We tested a multilevel path model assessing whether authenticity mediates the associations between suppressing negative emotions and amplifying positive emotions in predicting daily parenting outcomes. Results for all unique effects are shown in Figure 1 (path coefficients) and Table 2 (indirect effects). Consistent with research indicating that emotion regulation strategies co-occur (Côté & Morgan, 2002; Hamilton et al., 2009), we found that the more parents suppressed negative emotions, the more they also amplified positive emotions, as shown by the significant covariance between these variables. In addition, when assessing the unique

effects of each regulation strategy by controlling for the effects of the other, we found, as indicated by the total effects, that both emotion regulation strategies predicted lower emotional well-being and lower relationship quality, while only amplifying positive emotions predicted lower responsiveness.

We additionally found that amplifying positive emotions uniquely predicted lower authenticity, which mediated the links between amplifying positive emotions and costs across all outcomes. Positive emotion amplification continued to predict costs across all outcomes as indicated by the significant direct effects, indicating that authenticity only partially explained the link between positive emotion amplification and daily outcomes. In contrast, suppressing negative emotions was not linked with lower authenticity, which therefore did not mediate the associations between negative emotion suppression and daily outcomes. Furthermore, negative emotion suppression no longer predicted costs across daily outcomes as indicated by nonsignificant direct effects, indicating that after accounting for the costs of positive emotion amplification, negative emotion suppression was no longer costly for parents. Results from this multilevel path analysis collectively demonstrated that amplifying positive emotions uniquely detracts from daily emotional well-being, relationship quality, and responsiveness due to feelings of lower authenticity, and this was true above and beyond the effects of negative emotion suppression, which no longer predicted daily costs.

Does parental well-being drive emotion regulation? While we were able to establish causal direction in Study 1, in Study 2 we traded experimental control for ecological validity and thus could not definitively establish whether each regulation strategy caused declines in parental outcomes. However, we attempted to address the directionality of effects in this study in two ways. First, we conducted lagged-day analyses to assess whether the two emotion regulation strategies predicted changes in parental outcomes from one day to the next or vice versa, given that lagged analyses are often used in daily experience designs to establish the temporal order of effects. However, it is important to note that our current design was not ideal for these analyses. Given that parents completed the daily measures pertaining to a particular caregiving experience each day rather than for each day in general, we had limited inferential ability since it is unlikely that, for example, engaging in one of the emotion regulation strategies in one specific caregiving experience would affect parental outcomes in a completely different caregiving experience the next day. Indeed, results of these analyses did not provide support for our hypothesized model or a model in the reverse direction (all 16 effects were nonsignificant with *bs* ranging from $|0.01|$ to $|0.11|$, all $ps \geq .25$).

Second, we tested two alternative models linking parental negative emotion suppression and positive emotion amplification with daily parenting outcomes. In the first

Table 2. Indirect Effects of Authenticity Mediating the Associations Between Parental Emotion Regulation and Daily Outcomes in Study 2.

Emotion regulation strategy	Outcomes					
	Emotional well-being		Relationship quality		Responsiveness	
	Indirect effect	<i>p</i>	Indirect effect	<i>p</i>	Indirect effect	<i>p</i>
Independent effects						
Negative emotion suppression	-0.04 [-0.06, -0.01]	.01	-0.03 [-0.06, -0.01]	.01	-0.05 [-0.08, -0.01]	.01
Positive emotion amplification	-0.06 [-0.08, -0.03]	<.001	-0.05 [-0.07, -0.03]	<.001	-0.08 [-0.11, -0.04]	<.001
Unique effects						
No Controls						
Negative emotion suppression	-0.02 [-0.05, 0.01]	.17	-0.02 [-0.04, 0.01]	.19	-0.02 [-0.06, 0.01]	.18
Positive emotion amplification	-0.05 [-0.08, -0.03]	<.001	-0.04 [-0.06, -0.02]	<.001	-0.07 [-0.10, -0.03]	.001
Care difficulty control						
Negative emotion suppression	-0.01 [-0.02, 0.01]	.39	-0.01 [-0.02, 0.01]	.42	-0.01 [-0.04, 0.02]	.40
Positive emotion amplification	-0.01 [-0.02, 0.001]	.08	-0.01 [-0.03, 0.001]	.08	-0.03 [-0.05, 0.003]	.09
Child's mood control						
Negative emotion suppression	-0.001 [-0.01, 0.01]	.93	-0.001 [-0.01, 0.01]	.93	-0.002 [-0.03, 0.03]	.93
Positive emotion amplification	-0.01 [-0.03, -0.003]	.01	-0.02 [-0.03, -0.004]	.01	-0.03 [-0.06, -0.01]	.01

Note. "Independent effects" refer to models in which negative emotion suppression and positive emotion amplification were tested as predictors in two separate models. "Unique effects" refer to models in which negative emotion suppression and positive emotion amplification were tested as simultaneous predictors in a single model.

alternative model, we tested whether parents felt more authentic when they experienced greater emotional well-being (as well as relationship quality and responsiveness), and that feeling more authentic, in turn, prompted parents to be less likely to suppress negative and amplify positive emotions. In the second alternative model, we tested whether experiencing greater emotional well-being (as well as relationship quality and responsiveness) decreased the degree to which parents amplify positive and suppress negative emotions, thereby promoting greater authenticity. As shown in Table 3, results did not support either of these possibilities, indicating nonsignificant indirect effects for all causal paths.

Does the challenging nature of care matter? We next sought to determine whether each emotion regulation strategy was costly independent of how challenging parents felt it was to provide care, given that, as shown in Table 4, parents engaged in both regulation strategies the more they perceived care to be difficult and their child to be in a bad mood. Thus, we retested our full hypothesized model of the unique effects of each emotion regulation strategy while controlling for care difficulty and child mood as separate covariates. As shown in Table 2, after controlling for care difficulty, results indicated that as before, authenticity mediated the link between amplifying positive emotions—but not suppressing negative emotions—and daily costs across all outcomes, although these indirect effects were weakened to marginal significance. Also shown in Table 2, after controlling for child's mood, authenticity significantly mediated the link between amplifying positive emotions—

but not suppressing negative emotions—and all outcomes. Finally, we found that care difficulty and a child's mood by and large did not moderate the association between each emotion regulation strategy and daily costs, with only two of 16 moderations being significant (see Table S4 in the online supplement for detailed results).

Do the particular behaviors in which parents engage matter? Last, we examined whether each emotion regulation strategy was similarly costly across the specific caregiving behaviors in which parents engaged given that, as shown in Table 4, both emotion regulation strategies were associated with specific parenting behaviors. We contrast coded parental behaviors (1 = engaged in behavior, -1 = did not engage in behavior) and tested models with both regulation strategies (simultaneously entered) moderated by one of the four caregiving behaviors to predict daily costs. For instance, we tested whether caring for a child's basic needs moderated negative emotion suppression and positive emotion amplification in predicting authenticity, emotional well-being, relationship quality, and responsiveness. We repeated this for each caregiving behavior. Results indicated that the costs of amplifying positive and suppressing negative emotions were generally consistent across the different behaviors in which parents engaged, with only one of 32 interactions reaching significance. That is, regardless of the specific behaviors in which parents engaged, they still experienced lower authenticity, emotional well-being, relationship quality, and responsiveness when they suppressed negative and amplified positive emotions (see Table S5 in the online supplement for detailed results).

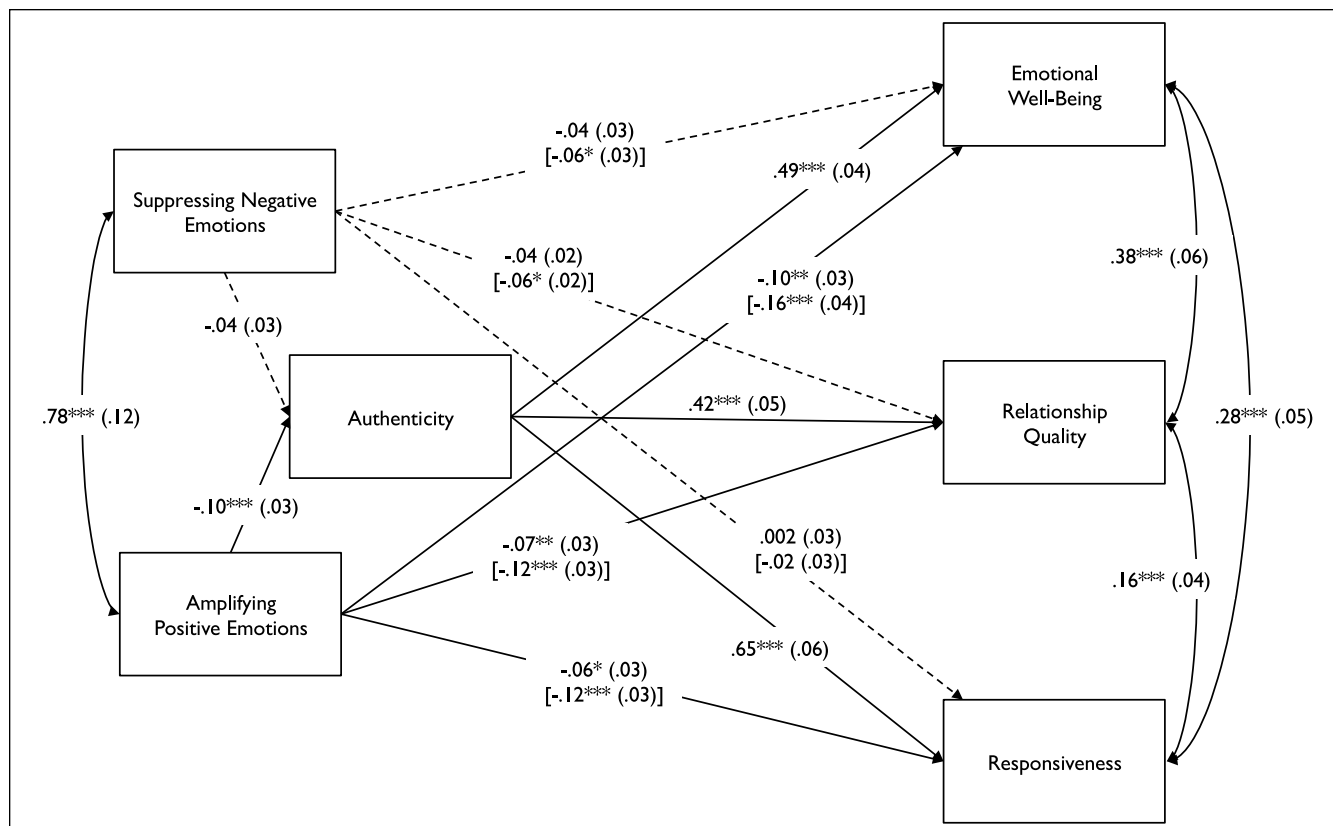


Figure 1. Multilevel path model of the unique effects of negative emotion suppression and positive emotion amplification predicting daily outcomes as mediated by authenticity.
 Note. All values represent unstandardized multilevel coefficients and their standard errors (in parentheses). Values within square brackets represent total effects.
 $*p \leq .05$. $**p \leq .01$. $***p \leq .001$.

Table 3. Alternative Model Indirect Effects in Study 2.

Exogenous variables	Emotion regulation strategy			
	Negative emotion suppression		Positive emotion amplification	
	Indirect effect	<i>p</i>	Indirect effect	<i>p</i>
Alternative Model 1				
Emotional well-being	-0.01 [-0.03, 0.01]	.27	-0.01 [-0.03, 0.01]	.44
Relationship quality	-0.02 [-0.06, 0.02]	.25	-0.02 [-0.06, 0.03]	.48
Responsiveness	-0.03 [-0.10, 0.03]	.24	-0.03 [-0.10, 0.04]	.46
Alternative Model 2				
Emotional well-being	0.002 [-0.01, 0.01]	.67	0.01 [-0.01, 0.02]	.37
Relationship quality	0.002 [-0.01, 0.01]	.69	0.004 [-0.01, 0.01]	.37
Responsiveness	0.000 [-0.002, 0.001]	.84	0.002 [-0.003, 0.01]	.43

Note. Alternative Model 1 tested authenticity as a mediator simultaneously predicting both emotion regulation strategies. Alternative Model 2 tested emotion regulation strategies as simultaneous mediators predicting authenticity.

Discussion

Caring for children can be highly meaningful and gratifying, but it can also be difficult, frustrating, or boring. As such, parents may at times be motivated to express emotions to their children that are incongruent with the emotions they

genuinely experience. For instance, parents might withhold their expressions of negative emotions in public so as to not hurt their child or damage their own self-image, or they might express greater joy than they really feel to show their child support or share in happy experiences together. In the current studies, we examined how parents' use of negative

Table 4. The Challenging Nature of Care and Caregiving Behaviors Predicting Parental Emotion Regulation in Study 2.

Predictors	Outcomes			
	Negative emotion suppression		Positive emotion amplification	
	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>
Challenging nature of care				
Care difficulty	0.17 [0.09, 0.24]	<.001	0.25 [0.16, 0.34]	<.001
Child mood	0.22 [0.14, 0.29]	<.001	0.21 [0.12, 0.29]	<.001
Caregiving behaviors				
Routine and basic needs	-0.14 [-0.28, 0.004]	.06	-0.15 [-0.29, -0.02]	.02
Enrichment and recreational activities	-0.21 [-0.33, -0.08]	.001	-0.02 [-0.17, 0.12]	.76
Advice, comfort, and encouragement	0.50 [0.29, 0.70]	<.001	0.09 [-0.12, 0.29]	.39
Control and discipline	-0.01 [-0.18, 0.17]	.94	0.13 [-0.08, 0.33]	.22

Note. Bivariate (i.e., single predictor, single outcome) multilevel models were tested for each estimate. Higher values for care difficulty and child mood indicate greater difficulty and poorer mood, respectively. Caregiving behaviors were coded as 1 = engaged in behavior and -1 = did not engage in behavior.

emotion suppression and positive emotion amplification during child care shapes their sense of authenticity, emotional well-being, relationship quality with their child, and feelings of responsiveness to their child's needs.

Results from the current studies indicated that there are negative consequences associated with parental efforts to suppress negative and amplify positive emotions. In Study 1, when parents reported suppressing negative and amplifying positive emotions in recalled caregiving experiences, they reported feeling lower authenticity, emotional well-being, relationship quality, and responsiveness to their child's needs relative to caregiving experiences in which they did not report regulating their emotions. These independent costs of suppressing negative emotions and amplifying positive emotions were replicated in daily life in Study 2. However, in Study 2, results indicated that parents uniquely felt less authentic when amplifying positive emotions, but not when suppressing negative emotions, when accounting for the effects of the other regulation strategy. In turn, lowered authenticity mediated the link between positive emotion amplification, but not negative emotion suppression, and costs across daily outcomes. Parents' perceptions of their child's mood could not account for the links between regulating emotions and compromised well-being, relationship quality, and responsiveness during caregiving across both studies, while care difficulty weakened the unique costs of positive emotion amplification in daily life only. In addition, the regulation of positive and negative emotions in daily life was generally costly regardless of the specific behaviors in which parents engaged. Last, tests of alternative models suggested that it is more likely that emotion regulation in daily life detracts from parental caregiving outcomes, rather than the other way around.

Implications for Emotion Regulation in Close Relationships

The current findings build upon research on emotion regulation in close relationships (English et al., 2013; Martini &

Busseri, 2012) by indicating that negative emotion suppression and positive emotion amplification are associated with poor outcomes in the parent-child relationship. Also consistent with past research (Dix et al., 2014), the current findings indicated that parents were more likely to regulate their emotions when caregiving was challenging to provide, with emotion regulation being costly regardless of a child's mood. However, while suppressing negative and amplifying positive emotions were costly above and beyond care difficulty in our experimental recall study, in our daily experience study care difficulty did partially account for the unique indirect effect of amplifying positive emotions, after accounting for negative emotion suppression, on daily costs as mediated by authenticity. These results are consistent with research indicating that parents report experiencing lower well-being when children have more difficult temperaments (Laukkanen et al., 2014). These results also indicate that the extent to which amplifying positive emotions uniquely detracts from parental outcomes is bound by the extent to which care is difficult as assessed in daily life. Given the mixed findings across our two studies regarding the role of care difficulty, it will be important for future research to identify the conditions under which parents' perception of care difficulty dampens the well-being costs of positive emotion amplification upon accounting for negative emotion suppression. While the current findings are consistent with previous research, they also deviated from research indicating anger suppression may promote more constructive (i.e., less over-reactive) parenting during discipline (Lorber, 2012), given that the current results indicated that suppressing negative and amplifying positive emotions compromised parental responsiveness to a similar degree across the different caregiving behaviors in which parents engaged.

One possible reason for why the current results diverge from previous findings may be due to the fact that our assessment of emotion regulation parsed apart the unique effects of regulating positive and negative emotions. With a few

exceptions (see Côté & Morgan, 2002; Le & Impett, 2013; Nezlek & Kuppens, 2008), suppression has typically been assessed as a composite of the suppression of both positive and negative emotions (English et al., 2013), and, likewise, emotional amplification has been assessed for emotions felt generally, independent of valence (Hamilton et al., 2009). By examining the regulation of positive and negative emotions in tandem, our results shed light on the unique effects of each strategy. An important extension of the current work is the identification of a context in which suppression is no longer associated with lower authenticity. Numerous studies have found that suppression compromises felt authenticity (English & John, 2013; Gross & John, 2003; Impett et al., 2012, Impett et al., 2014); however, none of these studies have taken into consideration the role of positive emotion amplification. The current findings indicate that, at least for parents, positive emotion amplification more substantially detracts from feelings of authenticity relative to negative emotion suppression. Given that parents engage in negative emotion suppression to a greater degree than positive emotion amplification (see means in Study 2), it is possible that they become more accustomed to using this strategy, and, in turn, may be buffered from compromised authenticity. Our findings indicate that the mechanism by which suppression is costly upon accounting for positive emotion amplification should be further elucidated, a point we return to when considering future directions of this work.

The current findings also provide novel insights into emotion regulation by indicating that amplifying positive emotions is costly not only in the workplace but also in close relationships. While positive emotions are important for affiliation (Harker & Keltner, 2001) and shared happiness (Gable et al., 2004), the current findings identify an instance in which positive emotion expression in relationships detracts from high-quality relationships—at least from the perspective of the regulator. These results suggest that the benefits of positive emotions may be reaped the most when they are genuinely expressed (Grandey et al., 2012) and build on an emerging literature concerning when pursuing positive emotions might backfire (Ford & Mauss, 2014). It will be important for future research to assess, through the use of survey and observational methods, whether different forms of positive emotion amplification, such as upregulating felt emotions, may be less costly than feigning positive emotions, which we focused on in the current studies.

Limitations and Future Directions

Given that we assessed suppressing negative and amplifying positive emotions via recall survey methods, one limitation concerns retrospective biases. As parents recalled how their emotional expression mismatched their emotional experience, they may have actually felt lower levels of authenticity in the moment when caring for their children than they reported on in our surveys. Although we attempted to

minimize retrospective biases with a daily experience design in Study 2, it will be important for future research to examine each emotion regulation strategy in the lab and in real time to minimize the potential confounds of retrospective biases.

In addition, future research should aim to determine whether negative emotion suppression no longer detracts from authenticity after accounting for positive emotion amplification in other relationships. Thus far, authenticity has been the primary mechanism identified for explaining why people experience poorer relational outcomes when suppressing their emotions in adult close relationships, with other explanations, such as reduced positive emotion expression, being ruled out as alternative mechanisms (Butler et al., 2003; English & John, 2013). However, it may be that feeling authentic is less important in parent–child relationships—or vertical relationships of unequal status—where the needs of children are of higher priority than those of parents; thus, when suppressing negative emotions, parents may find the need to feel authentic less important than their need to feel authentic in relationships with friends, romantic partners, and coworkers—or horizontal relationships of relatively equal status. We return to the discussion of vertical and horizontal relationships below.

Future work should also aim to examine whether the motivations underlying parental emotion regulation efforts may also help explain why suppressing negative and amplifying positive emotions is costly, given that the goals people pursue in their relationships have important consequences for personal and relationship well-being (Crocker & Canevello, 2008; Stroebe et al., 2013). Previous research has indicated that parents have both self- and child-oriented motivations for suppressing their emotions (Martini & Busseri, 2012). For instance, parents may be motivated to regulate their emotions with the goal of preventing negative evaluations from others when in public or because they believe doing so will facilitate them in meeting their child's needs. Research has indicated that when mothers regulate their emotions as motivated by child-oriented goals, both they and their adult children experience greater satisfaction and positive affect (Martini & Busseri, 2012). Given these findings, it will be important to examine whether other-oriented goals underlying parental negative emotion suppression and positive emotion amplification promote costs or benefits to both parents and their children (see Tables S6 and S7 in the online supplement for a preliminary examination of emotion regulation goals).

Future research should also aim to examine two complementary emotion regulation strategies to those examined in the current investigation: positive emotion suppression and negative emotion amplification. There are likely times when parents suppress positive emotions—such as to avoid embarrassing their child when their child makes a comical language error—and times when parents amplify negative emotions—such as to more effectively and calmly communicate to a child that they misbehaved or put themselves in a

dangerous situation. We expect that these emotion regulation strategies would be similarly costly to parents given the taxing and inauthentic nature of engaging in these strategies (see Table S8 in the online supplement for a preliminary examination of these emotion regulation strategies).

Last, future research should examine the effects of parental negative emotion suppression and positive emotion amplification on children's emotion regulation, well-being, and felt responsiveness from their parents. Much of the research on dyadic effects of emotion regulation has focused on horizontal relationships between romantic partners, friends, and the relationship between employees and customers (English et al., 2013; Grandey, 2000), documenting that partners experience costs or are unaffected by their partner's suppression of emotions (Butler et al., 2003; Impett et al., 2012). However, in vertical, parent-child relationships, research has indicated that when parents regulate their emotions, children either experience benefits or are unaffected by their parents' emotion regulation attempts (Lorber, 2012; Martini & Busseri, 2012). Given that in many horizontal relationships partners have comparable status and regulatory abilities, emotion regulation in these types of relationships may yield fewer benefits than in parent-child relationships where parents must, in many ways, shape their children's development. Indeed, theory and research have indicated that children's development of emotion regulation abilities may occur through modeling, or imitating, their parents' emotion expressivity and regulation, which may subsequently promote positive outcomes for children (Bariola et al., 2011; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997; Eisenberg et al., 2001; Morris, Silk, Steinberg, Myers, & Robinson, 2007). Thus, it will be important to examine whether children of parents high in negative emotion suppression and positive emotion amplification are also likely to engage in similar strategies themselves, and whether engaging in these strategies may be beneficial or costly for children.

Conclusion

The current studies contribute to a growing literature that seeks to understand when, why, and how parenthood is associated with well-being (Nelson et al., 2014). The findings shed light on one condition under which parenting may be associated with more pain than pleasure: when parents express more positive emotions than they genuinely feel and mask the negative emotions that they do feel when caring for their children. Future research should identify more adaptive ways for parents to regulate their emotions that allow them to feel true to themselves and contribute to the most joyful and optimal experiences of parenting.

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Authors' Note

Data from Study 2 appear in Le and Impett (2015); however, besides descriptive statistics, all results are distinct.

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Notes

1. When including six parents who stated they never suppress negative emotions and six parents who stated they never amplify positive emotions in the analyses, all results remained the same, with only one exception. Specifically, parents no longer reported amplifying positive emotions more in the amplifying positive emotion condition relative to the control condition ($b = 0.25 [-0.07, 0.56], p = .12$), although this effect trended in the expected direction. This finding is not surprising given that it includes parents who reported they never engage in this strategy.
2. Two parents reported on 3-year-old children. Given that these parents met all criteria for inclusion otherwise, we retained them in the final analyses.
3. In Study 1, we found that while mothers tended to engage in both emotion regulation strategies more than fathers, parent gender did not consistently moderate any key effects (see Table S2 in the online supplement for detailed results). We did not examine the moderating effect of parent gender in Study 2 given that the majority of the sample were mothers.
4. Across both studies, we found that parents did not engage in the two emotion regulation strategies differently based on their child's age. Furthermore, child age did not consistently moderate any of the key effects (see Table S3 in the online supplement for detailed results).

Supplemental Material

The online supplemental material is available at <http://pspb.sagepub.com/supplemental>.

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