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Parental apologies as a potential determinant of adolescents' basic psychological needs satisfaction and frustration



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ABSTRACT

Parenting research has documented positive associations between parents' tendency to apologize following their mishaps and indicators of adolescents' healthy development. One mechanism that may account for these benefits is apologies' potential role in restoring the satisfaction of adolescents' basic psychological needs, which may have been frustrated by parents' mishaps. Yet the associations between parental apologies, adolescents' basic needs, and ensuing developmental outcomes have never been studied. Furthermore, how parents phrase their apologies may differently relate to adolescents' basic needs, with victim-centered apologies being more likely to be need-supportive and defensive apologies more likely to be need-thwarting. To address these issues, we recruited 347 mid- to late adolescents and assessed parental apologies as well as adolescents' perceptions of their basic needs at three levels of abstraction (global, situational, and hypothetical) using correlational and experimental methods. At the global level, we also assessed indicators of adolescents' healthy development that were previously linked to parental apologies (i.e., internalizing and externalizing problems and prosocial behaviors). Across abstraction levels, parental apologies—whether perceived, coded, or manipulated as presenting more victim-centered elements and fewer defensive elements—tended to be associated with higher needs satisfaction and lower needs frustration. Furthermore, path

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analysis showed that the relation between parental apologies and adolescents' externalizing problems, internalizing problems, and prosocial behaviors could be fully accounted for by adolescents' perceptions of their basic needs. These results suggest that parental apologies may play a role in adolescents' basic psychological needs satisfaction and frustration and, in turn, in their development.

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Introduction

Repairing and maintaining healthy parent–adolescent relationships is beneficial for adolescents' psychological and social development (Barry et al., 2008; Buist et al., 2017). However, increases in parent–child disagreements and conflicts during adolescence (Smetana & Rote, 2019), paired with the commonality of (often minor) parental behaviors that may offend or hurt adolescents (Mabbe et al., 2018), indicate challenges associated with repairing and maintaining this relationship. As such, it is important to identify how parents may restore their relationship with their adolescents after situations in which they behaved hurtfully.

Recent parenting research suggests that parents may restore their relationship with their adolescents and foster associated positive developmental outcomes by apologizing for their role in conflictual interactions or for their offensive behaviors (Lee et al., 2023; Robichaud, Schumann, et al., 2024). Robichaud, Schumann, et al. (2024) notably relied on self-determination theory (SDT; Ryan & Deci, 2017) to propose that the relational benefits of parental apologies originate from their potential role in restoring adolescents' basic psychological needs, which may have been hindered by their parents behaving hurtfully. Specifically, parental apologies centered on addressing adolescents' hurt have been argued to satisfy adolescents' basic psychological needs, whereas parental apologies focusing on defending parents' behavior have been argued to thwart adolescents' basic psychological needs (Robichaud, Schumann, et al., 2024). Correspondingly, parental apologies characterized by more victim-centered (i.e., potentially need-supportive) elements or less defensive (i.e., potentially need-thwarting) elements have been associated with key developmental correlates of basic psychological needs, namely more prosocial behaviors and fewer internalizing and externalizing problems (Lee et al., 2023; Vansteenkiste et al., 2020). However, the specific relations between parental apologies and adolescents' basic psychological needs, as well as the potential mediating role of adolescents' basic psychological needs in the documented associations between parental apologies and adolescents' mental health and prosocial behaviors, have yet to be studied. Anchored in SDT (Ryan & Deci, 2017), this study attempted to address this gap by examining the role of parental apologies in the satisfaction and frustration of adolescents' basic psychological needs and, in turn, in adolescents' internalizing and externalizing problems as well as prosocial behaviors.

Parental apologies through the lens of SDT

The documented associations between parental apologies and adolescents' relationship and developmental outcomes may be understood through the lens of SDT (Ryan & Deci, 2017). SDT posits the existence of three psychological needs that are fundamental to humans' flourishing: autonomy (i.e., the need to feel agency over one's behaviors, thoughts, and feelings), competence (i.e., the need to feel effective), and affiliation (i.e., the need to feel connected to significant others; Vansteenkiste et al., 2020). According to SDT, the satisfaction and frustration of these needs are largely determined by one's interactions with others. Specifically, SDT posits a dual process model where need-supportive behaviors mostly satisfy basic psychological needs, which in turn mostly foster positive

developmental outcomes (e.g., prosocial behaviors), and where need-thwarting behaviors mostly frustrate basic psychological needs, which in turn mostly exacerbate negative developmental outcomes (e.g., internalizing and externalizing problems; Vansteenkiste & Ryan, 2013).

Transposing this idea to parent–adolescent relationships, Robichaud, Schumann, et al. (2024) reasoned that parenting mishaps may be harmful to adolescents because they thwart adolescents' basic psychological needs. They further argued that parental apologies could either restore or further thwart adolescents' basic needs, depending on their phrasing. Specifically, based on a literature review of elements that tend to be included in intergroup and interpersonal apologies (Kachanoff et al., 2017; Schumann, 2014), they proposed eight victim-centered (VC), potentially need-supportive, apology features that should increase parental apologies' benefits by focusing on the psychological needs of adolescents: (I) expressing remorse (e.g., "I am sorry"), (II) accepting responsibility for the harm done ("This is my fault"), (III) admitting the injustice or wrongdoing ("What I did was unfair"), (IV) acknowledging the victim's harm ("I hurt you"), (V) offering forbearance ("I'll be more careful in how I react moving forward"), (VI) offering repair ("I will compensate for what I did"), (VII) offering internally oriented explanations ("I reacted too quickly"), and (VIII) making non-pressuring requests of forgiveness ("I hope you can forgive me, although I understand if you are not ready"). By (a) acknowledging adolescents' injury and internal experience (e.g., Elements III, IV, and VIII), (b) redirecting the blame toward the parents (e.g., Elements II and VII), and (c) showing concern for the relationship (e.g., Elements I, V, and VI), these VC apology features should support adolescents' basic needs for (a) autonomy, (b) competence, and (c) affiliation, respectively.

In addition to these eight VC features, Robichaud, Schumann, et al. (2024) reviewed five defensive, potentially need-thwarting, features that should decrease parental apologies' benefits by focusing on parents' needs and defending their offensive behavior: (I) externally oriented excuses (e.g., "I had no control over how I reacted"), (II) justifications ("I wanted you to learn a lesson"), (III) blame ("I would not have reacted this way if you had behaved differently"), (IV) minimizations ("It was not that bad"), and (V) pressuring forgiveness requests ("It's time to move on"). By (a) invalidating adolescents' injury and internal experience (e.g., Elements IV and V), (b) directing blame toward the adolescents (e.g., Element III), and (c) prioritizing parents' integrity over the relationship (e.g., Elements I and II), these apology features should further thwart adolescents' basic needs for (a) autonomy, (b) competence, and (c) affiliation, respectively.

Thus far, there is only indirect evidence for the role of parental VC and defensive apology elements in adolescents' perceptions of their basic needs. First, VC and defensive parental apologies have been shown to relate to parent–adolescent relationship quality and adolescent developmental outcomes in the same way that typical need-supportive and need-thwarting parental behaviors do (e.g., Van Petegem et al., 2015; Wuyts et al., 2018). Regarding relationship quality, parental apologies characterized by more VC and fewer defensive elements predict higher parent–adolescent relationship satisfaction in adolescents, healthier motivations to forgive parents, and greater disclosure from adolescents to parents without hampering parental authority (Robichaud, Bureau, et al., 2024; Robichaud, Schumann, et al., 2024). Regarding adolescents' development, mothers who are coded as including more VC or fewer defensive apology elements tend to report having adolescents who have fewer internalizing and externalizing problems and who engage in more prosocial behaviors (Lee et al., 2023).

Second, VC and defensive apology elements have striking similarities with typical need-supportive and need-thwarting parenting behaviors. For instance, acknowledging the harm, offering internally oriented explanations, and making non-pressuring requests of forgiveness are three VC apology elements that are respectively akin to three key autonomy-supportive behaviors: acknowledging feelings, providing information, and offering choice (Mageau et al., 2015). As another example, blame and minimizations are two defensive apology elements that are respectively akin to two key autonomy-thwarting behaviors: guilt induction and invalidation of adolescents' perspective (Soenens & Vansteenkiste, 2010). As such, VC and defensive apology elements could represent additional parenting behaviors likely to play a role in adolescents' basic psychological needs satisfaction and frustration. Past research supports this proposition by showing (a) weak to strong correlations between VC and defensive apology elements and classic need-supportive and need-thwarting parenting behaviors (i.e., autonomy-supportive and autonomy-thwarting behaviors such as providing choice

and inducing guilt) as well as (b) associations between parental VC and defensive apology elements and parent–adolescent relationship outcomes that hold true even after controlling for these classic need-supportive and need-thwarting parenting behaviors (Robichaud, Schumann, et al., 2024).

The current study

Based on this body of evidence and associated knowledge gaps, our current study aimed to answer two research questions: (1) Are VC and defensive parental apologies related to adolescents' basic needs and (2) Can adolescents' basic needs mediate the relation between parental apologies and adolescents' key developmental correlates of basic psychological needs (i.e., internalizing problems, externalizing problems, and prosocial behaviors; Lee et al., 2023)? We hypothesized that parental apologies characterized by more VC and fewer defensive elements should be related to adolescents' higher basic needs satisfaction and lower needs frustration. Based on the documented role of individuals' basic needs in their optimal development (Vansteenkiste & Ryan, 2013), we further hypothesized that the documented associations between parental apologies and adolescents' developmental outcomes are mediated by the satisfaction and frustration of adolescents' basic needs (with higher needs satisfaction and lower needs frustration predicting fewer internalizing and externalizing problems as well as more prosocial behaviors). Finally, in line with SDT's dual process model (Vansteenkiste & Ryan, 2013), we expected stronger relations between (1) VC apology elements, adolescents' need satisfaction, and prosocial behaviors as well as between (2) defensive apology elements, adolescents' need frustration, and externalizing and internalizing problems.

To test our hypotheses, we recruited adolescents and conducted a multi-method study, which included correlational and experimental designs and assessments at three levels of abstraction: global, situational, and hypothetical. At the global level, we examined the relation between (a) adolescents' perceptions of their parents' general tendency to use VC and defensive apology elements following offenses, (b) adolescents' general basic psychological needs satisfaction and frustration with their parents, and (c) adolescents' externalizing problems, internalizing problems, and prosocial behaviors. At the situational level, we examined whether perceived and coded parental apology responses following a recalled parental offense were associated with adolescents' ensuing basic psychological needs satisfaction and frustration within their parent–adolescent relationship. At the hypothetical level, we randomly assigned adolescents to hypothetical parental apology responses to the parental offense they had recalled at the situational level and compared the effects of such imagined responses on adolescents' basic psychological needs satisfaction and frustration in their parent–adolescent relationship.

Examining our research questions at these three levels of assessment balances strengths and limitations specific to each design while testing the replicability of our findings across designs, thereby providing a strong test of our hypotheses. Using experimental vignettes at the hypothetical level increases internal validity (by examining the directionality of our effects and adjusting for confounding factors), whereas recalling specific parental apology responses and ensuing basic needs satisfaction and frustration at the situational level heightens external validity (by tapping actual parent–adolescent interactions). In turn, assessing our constructs at the global level strengthens ecological validity (by verifying whether situational associations between parental apologies and basic needs translate into general associations between these constructs) and allows us to examine the roles of parental apologies and basic needs in key global developmental outcomes (i.e., mental health and prosocial behaviors).

To make a more stringent test of our hypotheses at each level of assessment, we controlled for key covariates. In correlational designs (global and situational levels), we controlled for the frequency and severity of parental offenses given that parents tend to differ in these two offense characteristics (e.g., Robichaud, Bureau, et al., 2024) and that these differences in turn have been related to proximal indicators of our outcomes of interest (e.g., Robichaud, Schumann, et al., 2024). We also controlled for sociodemographic variables known to occasionally influence results in the field of developmental psychology and parenting, namely adolescents' gender and age as well as parents' gender and socioeconomic status (Bornstein, 2016). In our experimental design (hypothetical level), we attempted to mitigate spillover effects related to the recalled parental offense and the recalled parental VC and

defensive apology responses by controlling for adolescents' perceptions of these variables. This, in addition to randomly assigning adolescents to each condition, enhanced the likelihood of orthogonality between conditions.

Method

Participants

Targeting high schools (85.01%) and colleges (14.99%), we recruited 347 mid- to late French-speaking Canadian adolescents still living with their parents ($M = 16.51$ years, $SD = 1.68$). Most participants identified as girls (63.58%). The remainder identified as boys (33.55%), non-binary (0.96%) or other diversity of gender (1.92%). Adolescents mostly identified as White or of European descent (85.75%). Adolescents also identified as Black or of African descent (8.39%), Asian (3.79%), Latino or Hispanic (2.65%), First Native or Métis (2.82%), or of Middle Eastern descent (0.63%). Most adolescents ($n = 288$) were specifically recruited for this project, and as such completed all sections of our study. This subsample was also included in Robichaud, Schumann, et al. (2024), and in Robichaud, Bureau et al. (2024), although different research questions were pursued. To ensure satisfactory statistical power to test our mediation model, we recruited an additional subsample of high school adolescents ($n = 59$; two classrooms) and asked them to only complete the global level section of our study (and unrelated questionnaires that were part of another project on parenting). This resulted in sample sizes of $n = 347$ for the global level of assessment and $n = 288$ for the situational and hypothetical levels of assessment.

We asked adolescents to complete our study while thinking about the parent with whom they interact most often (referred to as the "target parent" hereafter). Most adolescents targeted their mother (75.43%); the rest selected their father (23.70%) or a female relative (0.87%) as their target parent. Target parents were White or of European descent (86.24%), Black or of African descent (7.00%), Asian (3.69%), Latino or Hispanic (2.01%), First Native or Métis (1.49%), or of Middle Eastern descent (1.01%). Most target parents were well-educated, with 74.19% having a post-secondary certification and only 1.31% not having finished high school. Information on parents' annual income was more limited, with 48.70% of adolescents reporting not knowing it. Among those who knew, 58.43% reported an income of \$75,000 and higher, 18.54% reported an income from \$50,000 to \$75,000, 13.48% reported an income from \$30,000 to \$50,000, and the remaining 9.55% reported an income lower than \$30,000.

Procedure

Global level

At the global level, adolescents completed questionnaires while thinking of their target parents and themselves from a global perspective. Specifically, adolescents reported on (a) the extent to which their target parent tends to include the eight VC and five defensive apology elements in their apologies after behaving offensively toward them, (b) the extent to which their basic psychological needs tend to be satisfied and frustrated in general when they are with their target parent, (c) their externalizing and internalizing symptoms, and (d) their prosocial behaviors with their friends. Adolescents also reported on covariates, namely the general frequency and severity of their target parent's offenses and sociodemographics.

Situational level

At the situational level, we asked adolescents to recall a situation where their target parent behaved offensively toward them. Based on past work using offense recall procedures (Shnabel & Nadler, 2008), we asked adolescents to think about a situation that they remember well and in which their target parent behaved toward them in a way that was hurtful or that caused them injustice. Adolescents rated the severity of that offense, specified whether their target parent had apologized after

offending them, and then wrote down as precisely as possible what their target parent had said to apologize or instead of apologizing. This in turn allowed us to code the presence of VC and defensive apology elements. To assess adolescents' perceptions of the quality of their parental apologies, adolescents reported on the extent to which their parent's response following the offense contained each of the VC and defensive apology elements. Finally, adolescents rated the extent to which their target parent's apology (or lack thereof) satisfied or frustrated their basic needs in their relationship with them.

Hypothetical level

At the hypothetical level, a written prompt invited adolescents to try to "put aside what their target parent said and did after hurting them or causing them an injustice (e.g., apology, lack of apology) and to imagine the following situation." Adolescents then read one of four (randomly assigned) hypothetical parental apology responses. In the basic condition, parents were described as giving a basic apology with one VC element (i.e., an expression of remorse): "I apologize for what I did." In the defensive condition, parents added three defensive elements to their basic apology: "I apologize for what I did, but it was not that bad and besides, I had good reasons. You know, these things can happen in a relationship." In the VC condition, parents included three VC elements on top of their basic apology: "I apologize for what I did. It was wrong. I should have behaved better. I'll make efforts to ensure that this does not happen again in the future." Finally, in the no apology condition, adolescents were invited to imagine that their "target parent had the opportunity to offer an apology but said nothing."

In line with past experimental studies on apologies using similar designs (e.g., [Kachanoff et al., 2017](#); [Schumann & Dragotta, 2020](#)), we refrained from using the exhaustive list of VC and defensive apology elements in our VC and defensive conditions for realism purposes (on average, parents and people in general tend to spontaneously include two or three apology elements in their apologies; [Adams-Clark et al., 2021](#); [Schumann, 2014](#)). Rather, we chose the VC and defensive elements that (a) tend to be the most frequently used by parents in their apologies ([Adams-Clark et al., 2021](#)) and (b) were best suited to our manipulation (which necessitated generic sentences given that participants recalled their own offenses). To increase the probabilities that any difference (or lack thereof) between the VC and defensive conditions could be attributed to their VC and defensive content, both conditions (which were presented in French) had the same number of apology elements, words, and characters. However, given the smaller content of the basic apology and no apology conditions (which had one VC and zero apology elements, respectively, and thus fewer words and characters), the word count and characters of these two conditions differed (a) from the VC and defensive conditions and (b) from one another.

After reading their assigned parental response, adolescents rated the extent to which that response would satisfy and frustrate their basic psychological needs for autonomy, competence, and affiliation. To verify that we manipulated different forms of apologies (or lack thereof), we asked adolescents to rate the extent to which they believed that their assigned parental response was an apology.

Task order and interference effects

We conducted our entire study in a single session, with all participants completing each measure in the following order: (1) all parental apology and offense measures at the global level, (2) all variables at the situational level, (3) all variables at the hypothetical level, (4) all dependent variables at the global level, and (5) sociodemographic variables. To minimize potential task order and interference effects between assessment levels, we (a) used different apology measures at each level of assessment (i.e., perceived, coded, and manipulated), (b) temporally separated participant responses to the independent and dependent variables at the global level, (c) ensured that the prompts for our dependent variables were different at each assessment level (see "Measures" section), and (d) controlled for potential spillover effects related to the recalled parental offense and apology response at the hypothetical level. To control for spillover effects, we entered as covariates (a) adolescents' perceptions of the VC and defensive apology elements in the recalled parental apology response (using the Parental Apology Quality Scale; [Robichaud, Schumann, et al., 2024](#)) and (b) adolescents' basic needs satisfaction or frustration following the recalled parental apology response.

Measures

Global level (G)

Parental apologies (G). At the global level, adolescents reported on their target parent's apologies using the Parental Apology Quality Scale (PAQS; Robichaud, Schumann, et al., 2024). This 13-item scale presents all eight VC ($\omega = .94$) and five defensive ($\omega = .90$) apology elements outlined in prior studies (i.e., Kachanoff et al., 2017; Schumann, 2014) and asks adolescents to rate the extent to which they agree that each element generally corresponds to the way their target parent speaks to them after hurting them or causing them injustice. The PAQS has a clear two-factor structure and is related to correlates of need-supportive and need-thwarting parental behaviors (Robichaud, Schumann, et al., 2024).

Basic psychological needs (G). To measure adolescents' basic psychological needs in their relationship with their target parent, we used a 12-item version of the Basic Needs Satisfaction in Relationship Scale (BNSRS; La Guardia et al., 2000). This scale assesses the extent to which adolescents agree that their basic psychological needs are satisfied or frustrated in general when they are with their target parent. Thus, this scale measures the satisfaction / frustration level of adolescents' needs for autonomy (e.g., "I feel free to be who I am" / "I feel controlled and pressured to be certain ways"), affiliation (e.g., "I feel loved and cared about" / "I often feel a lot of distance in our relationship"), and competence (e.g., "I feel like a competent person" / "I often feel inadequate or incompetent"). Internal consistency was satisfactory for both the needs satisfaction ($\omega = .94$) and needs frustration ($\omega = .79$) subscales.

Externalizing and internalizing problems (G). To measure adolescents' externalizing and internalizing problems, we used the Youth Self-Report of the Achenbach System of Empirically Based Assessment (Achenbach & Rescorla, 2014). Externalizing problems are measured with 32 items capturing rule-breaking and aggressive behaviors ($\omega = .89$). Internalizing problems are measured with 32 items capturing anxious/depressed symptoms, withdrawn/depressed symptoms, and somatic complaints ($\omega = .94$).

Prosocial behaviors (G). To assess adolescents' prosocial behaviors, we followed the lead of past research focusing on the link between parenting behaviors and adolescents' prosocial behaviors (Padilla-Walker et al., 2012) and used the Kindness and Generosity subscale of the Values in Action Inventory of Strengths (Peterson & Seligman, 2004). This 9-item subscale measures the extent to which adolescents agree with various prosocial behavior statements regarding their friends (e.g., "I help my friends even if it is not easy for me"; $\omega = .95$).

Covariates. Parental offense frequency and severity (G). To assess adolescents' perceptions of the general frequency and severity of their parent's offenses, we developed measures based on past studies assessing interpersonal offenses (Shnabel & Nadler, 2008). Thus, adolescents reported on the frequency of their parent's offenses by indicating how frequently their target parent behaves in a way that is hurtful to them or that causes them an injustice. Adolescents reported on the severity of their parent's offenses by indicating the extent to which these offenses generally make them feel (1) hurt, (2) the victim of an injustice, (3) disrespected, or (4) upset ($\omega = .89$).

Sociodemographics. Adolescents indicated their age, gender, and sex as well as their target parent's gender, education status, and income. Given the insufficient ratio of participants who identified as non-binary or other diversity of gender, we used adolescents' sex (rather than gender) as a covariate. To account for parents' education status and income in our analyses, we calculated a socioeconomic status (SES) index by averaging their standardized scores.

Situational level (S)

Perceived parental apologies (S). At the situational level, adolescents completed the PAQS again (Robichaud, Schumann, et al., 2024), but this time while thinking about their target parent's response to the recalled offense (see "Procedure" section). Internal consistency was once again satisfactory for both the VC ($\omega = .94$) and defensive ($\omega = .88$) subscales.

Coded parental apologies (S). To code parental apologies, we asked adolescents to write down, as best as they could remember, the exact words their parent had said to apologize (or instead of apologizing) after the recalled offense. A trained research assistant then coded whether each of the eight VC and five defensive apology elements outlined in the PAQS was present or absent in the described parental apology responses. When an element was present in an apology response, it received a score of 1. When an element was not present, it received a score of 0. To create our coded variables, we calculated ratio scores of VC and defensive apology elements, where a score of 1 implies that 100% of all VC (or all defensive) apology elements were present.

This coding system has satisfactory interrater reliability (VC intraclass correlation coefficient [ICC] = .86; defensive ICC = .74) and is moderately to strongly correlated with the PAQS in theoretically expected directions ($ps < .001$; see Table 1). It is limited, however, in that 77 of the 288 responses could not be coded because participants did not answer ($n = 50$), answered that they did not remember the exact phrasing their target parent had used ($n = 15$), or answered improperly ($n = 12$; e.g., indecipherable answer).

Basic psychological needs (S). Adolescents indicated the extent to which the recalled parental apology response satisfied or frustrated their basic psychological needs using a shortened version of the BNSRS (La Guardia et al., 2000). In this shortened 6-item version, each item assesses the satisfaction or frustration of one need. Internal consistency was satisfactory for both the needs satisfaction ($\omega = .86$) and frustration ($\omega = .77$) subscales.

Parental offense severity (S). Finally, adolescents reported on the severity of the recalled parental offenses. They filled out the same 4-item offense severity questionnaire as at the global level, but this time while thinking about the recalled parental offense ($\omega = .90$).

Hypothetical level

At the hypothetical level, we manipulated the parental apology response to the recalled offense and asked adolescents to answer the 6-item version of the BNSRS (La Guardia et al., 2000) while thinking of the assigned hypothetical parental response. The internal consistency of both the needs satisfaction ($\omega = .88$) and frustration ($\omega = .79$) subscales was satisfactory. As a manipulation check, we asked adolescents to indicate the extent to which they agreed that their assigned parental response led them to consider that their target parent had apologized.



Plan of analyses

Preliminary analyses

Prior to answering our research questions, we verified for outliers, ensured that our continuous variables were normally distributed, and verified missing data. We also examined correlations between our variables (global and situational levels) and tested the success of our manipulation (hypothetical level). To test the success of our manipulation, we conducted multivariate analyses of variance (M/ANOVAs) to (a) ensure orthogonality between conditions on adolescents' perceptions of the VC and defensive apology elements in the recalled parental apology response (using the PAQS) and on adolescents' basic needs satisfaction or frustration following the recalled parental apology response (randomization check) and to (b) ascertain that participants in the three apology conditions considered that their assigned apology response was more an apology than those in the no apology condition (manipulation check). Finally, given our assessments of multiple scales with single informants at the global and situational levels, we tested for common method variance biases at these two levels of abstraction. Specifically, we conducted Harman's single factor test by running an exploratory factor analysis at each assessment level with all main self-reported variables. Common method bias was considered present if the unrotated solution resulted in one factor that accounted for more than 50% of the variance (Kock et al., 2021).

Table 1
Means (and standard deviations) and correlations among the main variables of interest at the global and situational levels.

Variables	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Global VC apology elements	4.27 (1.65)															
2. Global defensive apology elements	3.11 (1.60)	-.35*														
3. Global needs satisfaction	5.45 (1.32)	.55*	-.50*													
4. Global needs frustration	2.83 (1.44)	-.47*	.49*	-.63*												
5. Global externalizing problems	0.28 (0.24)	-.23*	.32*	-.39*	.42*											
6. Global internalizing problems	0.56 (0.38)	-.23*	.35*	-.52*	.42*	.57*										
7. Global prosocial behaviors	6.02 (0.97)	.13*	-.02	.18*	-.16*	-.23*	.02									
8. Global offense severity	3.19 (1.61)	-.33*	.40*	-.48*	.36*	.25*	.50*	.13*								
9. Global offense frequency	2.49 (1.43)	-.49*	.51*	-.66*	.49*	.33*	.43*	.07	.58*							
10. Situational VC apology elements	4.08 (1.70)	.72*	-.40*	.60*	-.49*	-.18*	-.22*	.14*	-.32*	-.50*						
11. Situational defensive apology elements	2.92 (1.57)	-.34*	.77*	-.42*	.53*	.34*	.36*	-.01	.41*	.38*	-.32*					
12. Coded VC apology elements	0.13 (0.15)	.45*	-.26*	.36*	-.32*	-.24*	-.12	.06	-.11	-.26*	.61*	-.29*				
13. Coded defensive apology elements	0.15 (0.13)	-.27*	.31*	-.24*	.20*	.22*	.22*	-.02	.33*	.29*	-.34*	.34*	-.44*			
14. Situational needs satisfaction	4.54 (1.70)	.59*	-.46*	.76*	-.60*	-.34*	-.38*	.08	-.40*	-.55*	.69*	-.45*	.43*	-.32*		
15. Situational needs frustration	3.26 (1.63)	-.40*	.53*	-.56*	.68*	.35*	.38*	-.04	.34*	.46*	-.39*	.56*	-.33*	.23*	-.53*	
16. Situational offense severity	3.90 (1.83)	-.18*	.41*	-.35*	.31*	.21*	.42*	.20*	.73*	.49*	-.22*	.46*	-.08	.26*	-.34*	.43*

Note.  , Correlations at the global level;  , Correlations at the situational level; VC, victim-centered.

* $p < .05$.

Question 1: Are VC and defensive parental apologies related to adolescents' basic needs?

To answer our first research question, we conducted multivariate regressions with the maximum likelihood estimator (global and situational levels) and a multivariate analysis of covariance (MANCOVA) followed by analyses of covariance (ANCOVAs) and Tukey post hoc tests (hypothetical level). At the global level, we examined the relations between target parents' general tendency to use VC and defensive apology elements following offenses and adolescents' general needs satisfaction and needs frustration with their target parent while adjusting for the general frequency and severity of parental offenses as well as sociodemographics. At the situational level, we examined whether coded (Model 1) and perceived (Model 2) VC and defensive parental apology responses were associated with adolescents' basic needs satisfaction and frustration while adjusting for the same covariates as for the global level (although this time we modeled the severity of the recalled parental offense instead of the general severity of parental offenses). Finally, at the hypothetical level, we tested whether our manipulated parental apology responses affected adolescents' basic needs satisfaction and frustration while controlling for spillover effects related to the recalled parental offense and apology response (see "Task order and interference effects" section).

Question 2: Can adolescents' basic needs mediate the relation between parental apologies and adolescents' developmental outcomes?

To answer our second research question, we tested a mediation model in which relations between parents' general tendency to use VC and defensive apology elements and adolescents' developmental outcomes (i.e., externalizing problems, internalizing problems, and prosocial behaviors) are explained by adolescents' needs satisfaction and frustration, still adjusting for the general frequency and severity of parental offenses as well as sociodemographics. To determine whether a full mediation model (where the links between our measurements of VC and defensive parental apologies and our three developmental outcomes are fixed to zero, resulting in 6 degrees of freedom) would be better adjusted to our data than a partial mediation model (where all links between all variables are modeled, resulting in 0 degrees of freedom), we relied on the Bayesian information criterion (BIC), which adjusts for model complexity. Lower relative BIC scores imply better adjustment to the data, with differential BIC scores greater than 10 interpreted as very strong evidence for better adjustment (Raftery, 1995). To examine the model fit of our retained model, we used the comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), standardized root mean squared error (SRMR), and normed chi-square (NC). To test our indirect effects, we used 5000 bootstrap resamples.

In all our analyses, we modeled composite scores of adolescent needs satisfaction and frustration (for a total of 2 dependent variables per level of assessment). To handle missing data, we used full information maximum likelihood (global and situational levels) or aggregated 40 datasets that were imputed with the bootstrap expectation–maximization algorithm (hypothetical level). Thus, all participants and variables were included in our main analyses regardless of the presence (and amount) of missing values. Finally, to provide further insights into the relations between parental apologies and adolescents' basic psychological needs, we conducted supplemental analyses in which we (a) modeled each need separately (for a total of 6 dependent variables) and (b) compared the fit indices of our proposed model with those of alternative mediation models. Results and a discussion of these secondary analyses are available in online supplementary material. Data and R script for our main and secondary analyses are available on the Open Science Framework (<https://osf.io/8m9qw>).

Results

Preliminary analyses

Data distribution

Examining our data across levels of abstraction revealed the presence of outliers on four outcome variables, namely adolescents' general basic needs satisfaction ($n = 1$), externalizing problems ($n = 3$), internalizing problems ($n = 2$), and prosocial behaviors with friends ($n = 1$). As recommended (Tabachnik & Fidell, 2013), we brought these outliers to scores no further than 3.29 standard deviations from the mean while preserving their rank. Examining the distribution of our variables

across levels of abstraction after adjusting for outliers revealed that that all variables could be considered normally distributed (all kurtosis $\leq |1.46|$, all skewness $\leq |1.23|$).

Missing data

Examining missing data across levels of abstraction revealed noteworthy results. First, as reported in the “Measures” section, 26.7% of parental apology responses at the situational level could not be coded and therefore were missing. Second, 51.0% of answers on SES were missing. Third, 0.3% to 15.0% of data were missing on all other variables (global: 0.3%–15.0%; situational: 2.4%–12.9%; hypothetical: 5.9%–9.4%; $M = 8.2\%$, $SD = 4.8$). Because participants completed all levels of abstraction during a single assessment, there was no attrition. Finally, Little’s MCAR test using the normed chi-square suggested that data could be missing completely at random at all levels of abstraction ($NCs \leq 1.38$; Ullman, 2001).

Correlations

Examining correlations at the global and situational levels revealed associations that were consistent with our general hypotheses (see Table 1). At both levels, parental apologies perceived or coded as including more VC and fewer defensive apology elements were positively associated with needs satisfaction and negatively linked to needs frustration ($ps < .002$), with moderate to strong effect sizes for perceived apologies and small to moderate effect sizes for coded apologies. Furthermore, at the global level, adolescent higher needs satisfaction and lower needs frustration were moderately to strongly linked to fewer externalizing and internalizing problems and weakly associated with more prosocial behaviors ($ps \leq .001$).

Common method variance bias

Assessing common method bias using Harman’s single factor did not suggest the presence of problematic variance (Kock et al., 2021). Specifically, the unrotated solutions revealed factors that accounted for 30.40% at the global level and 33.82% at the situational level.

Manipulation success

Randomization check. At the hypothetical level, participants did not differ between conditions on their perceptions of the VC and defensive apology elements in the recalled parental apology response or on their basic needs satisfaction or frustration following the recalled parental apology response, as assessed at the situational level ($p = .291$). This result suggests adequate orthogonality between conditions.

Manipulation check. At the hypothetical level, adolescents’ perceptions of their assigned parental apology response differed between conditions, $F(3, 283) = 55.85$, $p < .001$, $\eta^2 = .37$. Post hoc tests supported the validity of our manipulation by showing that adolescents in all three apology conditions considered their assigned hypothetical parental response as an apology to a greater extent than those in the no apology condition ($M = 2.63$, $SE = 0.20$), $ps < .001$, with a moderate effect size for the defensive condition ($d = .42$) and large effect sizes for the basic ($d = .95$) and VC ($d = .88$) conditions. Furthermore, adolescents in the basic condition ($M = 5.61$, $SE = 0.16$) and VC condition ($M = 5.58$, $SE = 0.19$) considered their assigned hypothetical parental response as an apology to a greater extent than those in the defensive condition ($M = 4.01$, $SE = 0.19$), $ps < .001$, with moderate effect sizes for both conditions ($.49 \leq ds \leq .53$). Adolescents in the basic and VC conditions, however, did not differ ($p > .999$).

Question 1: Are VC and defensive parental apologies related to adolescents’ basic needs?

After adjusting for our covariates at the global level (see Table 2), parental apologies characterized by more VC and fewer defensive elements were weakly related to higher needs satisfaction ($ps \leq .002$) and lower needs frustration ($ps < .001$). After adjusting for our covariates at the situational level (see Table 2), coded and perceived VC apology elements were respectively weakly and strongly related to higher needs satisfaction and both were weakly related to lower needs frustration ($ps \leq .011$).

Table 2

Standardized beta coefficients [and 95% confidence intervals] of the relation between parental apologies and adolescent basic needs at the global and situational levels.

Variable	Needs satisfaction	Needs frustration
<i>Global level</i>		
VC apology elements	.23 [.14, .32]*	-.23 [-.34, -.13]*
Defensive apology elements	-.14 [-.23, -.05]*	.26 [.15, .36]*
Parental offense frequency	-.38 [-.48, -.28]*	.23 [.11, .35]*
Parental offense severity	-.11 [-.21, -.01]*	.08 [-.03, .20]*
Adolescent age	-.01 [-.09, .07]	.05 [-.05, .15]
Adolescent sex	-.03 [-.12, .06]	.09 [-.01, .19]
Parent gender	-.07 [-.15, .01]	.05 [-.04, .14]
Socioeconomic status	.19 [.08, .29]*	-.03 [-.15, .09]
<i>Situational level</i> (perceived parental apologies)		
VC apology elements	.52 [.43, .61]*	-.15 [-.26, -.04]*
Defensive apology elements	-.17 [-.27, -.08]*	.34 [.24, .45]*
Parental offense frequency	-.17 [-.28, -.06]*	.15 [.03, .27]*
Parental offense severity	-.05 [-.16, -.06]	.16 [.03, .29]*
Adolescent age	-.04 [-.13, -.05]	.07 [.04, .17]
Adolescent sex	-.01 [-.10, -.09]	.13 [.02, -.24]*
Parent gender	-.07 [-.15, -.02]	-.07 [-.17, -.03]
Socioeconomic status	.14 [.03, -.25]*	-.17 [-.29, -.05]*
<i>Situational level</i> (coded parental apologies)		
VC apology elements	.26 [.14, .38]*	-.22 [-.35, -.08]*
Defensive apology elements	-.06 [-.19, .07]	-.10 [-.24, .04]
Parental offense frequency	-.40 [-.52, -.29]*	.26 [.14, .38]*
Parental offense severity	-.06 [-.20, .07]	.30 [.16, .43]*
Adolescent age	-.08 [-.19, .02]	.08 [-.03, .19]
Adolescent sex	-.03 [-.15, .08]	.16 [.04, .28]*
Parent gender	-.05 [-.16, .05]	-.11 [-.21, -.00]*
Socioeconomic status	.13 [.00, .26]*	-.20 [-.33, -.07]*

Note. Adolescent sex: 0 = girl, 1 = boy. Parent gender: 0 = mother, 1 = father. VC, victim-centered.
* $p < .05$.

In contrast, perceived defensive apology elements were weakly related to lower needs satisfaction and moderately related to higher needs frustration ($ps < .001$). Coded defensive apology elements, however, were not related to adolescents' needs ($ps \geq .180$).

At the hypothetical level (see Fig. 1), we observed a moderate main effect of our manipulation on our outcomes of interest at the multivariate level after adjusting for adolescents' perceptions of the VC and defensive apology elements that were included in the recalled parental apology response as well as for adolescents' perceptions of their basic needs satisfaction and frustration following the recalled parental apology response, Wilks' $\Lambda = .79$, $F(3, 556) = 11.67$, $p < .001$, $\eta_p^2 = .11$. ANCOVAs then revealed respectively large and moderate main effects of our manipulation on adolescent needs satisfaction, $F(3, 280) = 22.27$, $p < .001$, $\eta^2 = .19$, and needs frustration, $F(3, 280) = 9.28$, $p < .001$, $\eta^2 = .09$. Post hoc tests showed that adolescents in the basic and VC apology conditions anticipated that their needs would be similarly ($ps \geq .892$) weakly more satisfied and less frustrated than those in the defensive condition ($ps < .001, .30 \leq ds \leq .38$) as well as moderately more satisfied and weakly less frustrated than those in the no apology condition ($ps < .001, .30 \leq ds \leq .56$). We found no difference between the no apology and defensive conditions on needs satisfaction and needs frustration ($ps \geq .073$).

Question 2: Can adolescents' basic needs mediate the relation between parental VC and defensive apologies and adolescent developmental outcomes?

Examining model fit revealed very strong evidence ($\Delta BIC = 26.09$) that our data were better adjusted to a full mediation model ($BIC = 9935.59$) compared with a partial mediation model

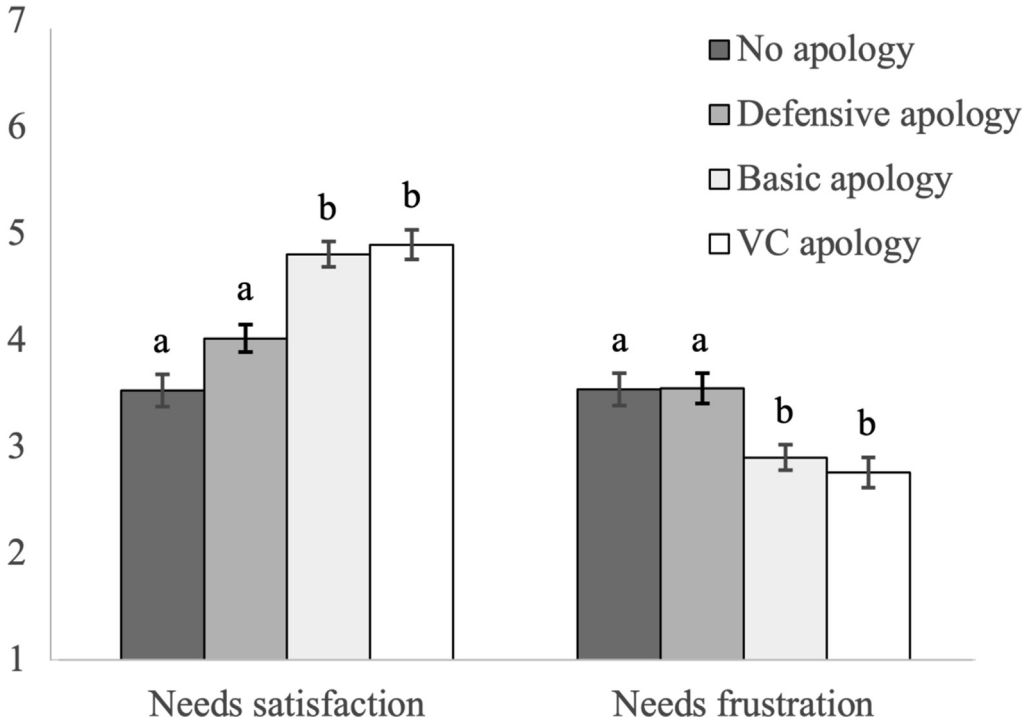


Fig. 1. Adolescents' basic needs in their relationship with their parent according to the manipulated parental apology response. For each variable, scores with a different letter (a or b) differ at $p < .05$. VC, victim-centered.

(BIC = 9961.68). Thus, we pursued our analyses by examining a full mediation model, which was more parsimonious and yielded satisfactory fit indices [CFI > .99, TLI = .97, RMSEA = .04, SRMR = .01, NC (6) = 1.5]. As can be seen in Fig. 2, after adjusting for covariates, parental apologies characterized by more VC and fewer defensive elements were weakly associated with higher needs satisfaction ($ps \leq .002$), which in turn was weakly associated with fewer internalizing problems ($p < .001$), moderately associated with more prosocial behaviors ($p < .001$), but not associated with externalizing problems ($p = .066$). Parental apologies characterized by more VC and fewer defensive elements were also weakly associated with lower needs frustration ($ps < .001$), which in turn was weakly related to

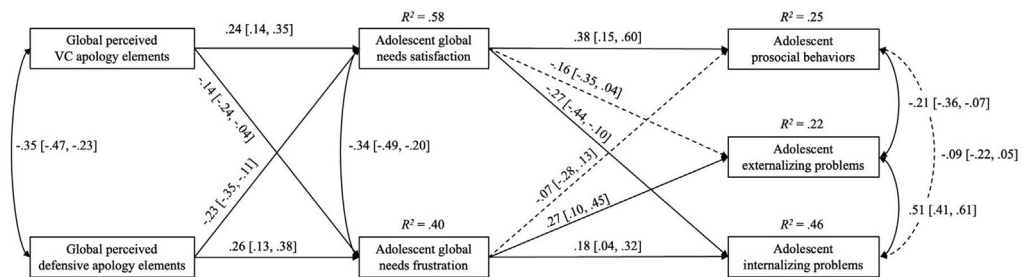


Fig. 2. Path analysis linking parental apologies to adolescent developmental outcomes via needs satisfaction and needs frustration. Numbers represent standardized beta coefficients [and 95% confidence intervals]. R^2 values represent the proportion of variance explained in each endogenous variable. Statistically significant relations at $p < .05$ are depicted with a full line. Non-statistically significant relations are depicted with a dotted line. All links between covariates and other variables are modeled but are not depicted for parsimony. VC, victim-centered.

higher externalizing and internalizing problems ($ps \leq .002$), but not to prosocial behaviors ($p = .284$). Examining indirect effects revealed that apologies characterized by more VC and fewer defensive elements were very weakly related to fewer internalizing problems and higher prosocial behaviors via higher needs satisfaction ($|.04| \leq \beta s \leq |.09|$, $ps \leq .019$). Apologies characterized by more VC and fewer defensive elements were also very weakly related to fewer externalizing and internalizing problems via lower needs frustration ($|.04| \leq \beta s \leq |.07|$, $ps \leq .016$).

Discussion

Healthy parent–adolescent relationships play a key role in fostering adolescents' development but can be hard to maintain. One way in which parents may maintain a healthy relationship with their adolescents is by apologizing for their role in conflicts or for their offensive behaviors toward their adolescents. Anchored in SDT, we tested the possibility that the documented developmental correlates of parental apology responses may stem from their role in the satisfaction and frustration of adolescents' basic psychological needs.

Parental apologies are related to adolescents' needs satisfaction and frustration

Our results suggest that parental apologies could play a role in the satisfaction and frustration of adolescents' basic psychological needs in their relationship with their parents. Overall, parental apologies characterized by more VC and fewer defensive elements were associated with higher needs satisfaction and lower needs frustration, implying that the apology elements outlined in previous research could be respectively need-supportive and need-thwarting. At the global and situational levels, we observed relations that were partially in line with SDT's dual process model. At the situational level, we observed stronger (i.e., moderate to strong) associations between adolescents' appraisal of VC apology elements and needs satisfaction, as well as between adolescents' appraisal of defensive apology elements and needs frustration, compared with cross-relations (which presented only small effects). At the global level, however, all relations were weak. It is possible that asking adolescents to recall their situational needs satisfaction and frustration in response to a specific parental apology facilitated the emergence of stronger relations between the two constructs (e.g., because undesirable sources of variability were reduced at this level of abstraction). Such stronger relations in turn could have facilitated the detection of correlation patterns consistent with SDT's dual process model. In contrast, asking adolescents to think about their general basic psychological needs satisfaction and frustration may have reduced the likelihood of any strong relation with parental apologies (given that several factors other than parents' tendency to apologize following offensive behaviors may play a role in adolescents' general basic needs satisfaction and frustration with their parents). Given that meta-analytic work in the field of parenting has offered support for the dual process model with assessments at the global level (Bradshaw et al., 2024), future research is needed to examine the contexts in which this model is likely to apply.

Results based on our coding system were somewhat different from those based on self-reports. Indeed, coded VC apology elements were only weakly positively associated with adolescents' needs satisfaction and negatively related to their frustration, and coded defensive apology elements were not related to adolescents' basic needs after adjusting for our covariates. This result may be interpreted in line with the principle of universality without uniformity (Soenens et al., 2015), which states that adolescents' subjective appraisals of parental behaviors are stronger predictors of the outcomes of such behaviors compared with more objective measurements of parents' behaviors. Alternatively, there may be issues with our coding system that reduced its predictive value. In particular, the acceptable yet weaker interrater reliability score of defensive apology elements (vs. VC apology elements), paired with the weaker correlations between coded and perceived defensive apology elements (vs. coded and perceived VC apology elements), suggests that our coding of defensive apologies might not have detected the need-thwarting value of parental apologies as reliably and precisely as our coding of VC apologies. One potential reason for this discrepancy is that some defensive elements (e.g., minimizing the harm done) may be experienced through a lack of words (e.g., abstaining from

acknowledging adolescents' suffering) or nonverbal language (e.g., sarcasm), both of which are difficult to capture with coding systems relying on written sentences. In line with this possibility, past research coding written parental apologies (e.g., Lee et al., 2023) or general interpersonal apologies (e.g., Schumann & Dragotta, 2021) have also had less success with their coding of defensive apology elements (i.e., as manifested by poorer psychometric properties and/or weaker predictive value compared with coded VC apology elements).

Results at the hypothetical level complemented those at the global and situational levels by offering insights into the directionality of the effects. In line with our correlational results, adolescents in the defensive apology condition reported lower needs satisfaction and higher needs frustration than those in the apology conditions that solely contained VC elements (i.e., the basic and VC conditions), although these effects were small. Results at the hypothetical level also extended those in our correlational designs by showing that some apologies can be perceived as negatively as the absence of an apology. Although adolescents considered the defensive apology response as more of an apology than the no apology condition (manipulation check), they did not anticipate that it would differ from an absence of an apology in terms of needs satisfaction and needs frustration. This finding suggests that omitting an apology may have similar psychological significance for adolescents than defensive apologies, perhaps because it (nonverbally) communicates defensive apology elements. For instance, when parents do not apologize, adolescents may think that their parents consider that they did not harm them (IV–minimization) or that they are not responsible for the harm done (I–externally oriented excuse, II–justification, or III–blame). Future research could test these possibilities by assessing the extent to which parental lack of apologies communicates defensive apology elements.

The fact that the basic and VC conditions did not differ is also worth discussing. At first glance, this may suggest that any non-defensive apologies are perceived as equally beneficial. Yet, a closer glance at our findings hints at the possibility that our VC condition lacked some realism, which in turn may have reduced its effectiveness. In particular, using generic sentences for our VC apology elements may have come across as less credible (or less meaningful) to participants compared with sentences that would have been specifically tailored to participants' own recalled offense. Alternatively, it is possible that the number of VC elements in an apology is a weaker determinant of basic needs satisfaction and frustration than adolescents' perceptions of the degree to which their parent apologized. Thus, future research is needed to clarify whether and how more elaborate VC apologies may distinguish themselves from more basic VC apologies.

Basic needs may mediate the relations between apologies and developmental outcomes

Finally, results supported the idea that the associations between parental apologies and the assessed adolescents' developmental outcomes could be mediated by adolescents' basic needs. Parental apologies were linked to adolescents' developmental outcomes in correlations (as could be expected based on past research; Lee et al., 2023), yet model fit indices from our path analysis suggested that our data were better adjusted to a full mediation model where such links were fixed at zero and thus fully explained by adolescents' basic needs. In line with SDT's dual process model (Vanteenkiste & Ryan, 2013), higher needs frustration was related to internalizing and externalizing problems but not to prosocial behaviors (thereby providing an indirect dark pathway between apologies and ill-being), whereas higher needs satisfaction was related to prosocial behaviors but not to externalizing problems (thereby providing an indirect bright pathway between apologies and well-being).

However, contrary to what SDT's dual process model would predict, needs satisfaction was also negatively related to internalizing problems (i.e., to a similar degree in terms of effect size as needs frustration), which in turn resulted in an indirect relation between parental apologies and ill-being via needs satisfaction. This pattern of results is nevertheless consistent with empirical research showing indirect positive associations between parental suboptimal behaviors (e.g., maltreatment) and internalizing problems in adolescents (e.g., depression) via lower needs satisfaction (e.g., Gu et al., 2023). Satisfaction of basic psychological needs provides key "nutrients" for adolescents to engage in growth-based activities and self-actualization, and as such it may help to counteract the development of internalizing problems.

Strengths, limits, and future directions

Results from our research are enhanced by noteworthy methodological strengths. First, we used three complementary methods to assess the potential role of parental apologies in adolescents' basic needs satisfaction and frustration and found consistent results across methods, which strengthens our confidence in the robustness of the findings. Using coded and experimental assessment of apologies also helped to overcome some issues associated with single informant studies and/or offered information on the directionality of the observed effects. In a similar vein, adjusting for key variables (global, situational, and hypothetical levels), verifying orthogonality between conditions (hypothetical level), and taking steps to minimize potential task order and interference effects across levels of assessment also increased confidence in the validity of the findings.

Second, we anchored our study in SDT (Ryan & Deci, 2017), which helped us to gain insights into potential psychological mechanisms underlying the documented associations between parental apologies and adolescents' developmental outcomes (Lee et al., 2023). Third, examining both VC and defensive apology elements helped to identify how apologies may be phrased to foster adolescents' well-being and to reduce their ill-being. This in turn can inform parents and experts on how parents may optimally apologize.

Our study also presents key limitations that should be addressed in future research. First, our mediation model was based on a cross-sectional design. As such, although we (a) tested the directionality of the effects between apologies and basic needs at the hypothetical level, (b) based our mediation model on strong theoretical grounds (Vansteenkiste & Ryan, 2013), and (c) found evidence that our proposed model was well-adjusted to our data (and, in supplementary analyses, was better adjusted to our data than alternative mediation models), it remains impossible to ascertain the directionality of any association between our modeled variables or to discard the possibility of alternative models in which the same variables are put in different orders. Thus, future research is needed to further ascertain the role of parental apologies in adolescents' development (e.g., by considering longitudinal bidirectional associations between our constructs).

Second, asking participants to complete all assessment levels may have created biases that reduced the validity of our findings, even though we included several procedural and statistical controls to minimize such biases. These biases include (a) artificial inflation of the result similarities across methods (given that participants were the same for all methods), (b) order effects (given that participants completed all levels of assessment in the same sequence), (c) interference effects (given that participants completed similar questionnaires at different assessment levels), and (d) socially desirable answers (given that previous items could have informed participants of possible apology elements). The fact that our different assessments of each construct positively correlated (see Table 1) does support the idea that our assessment levels were not independent, which is an important limitation. To overcome these biases, future research should use independent samples for each level of assessment. Other noteworthy biases and issues related to our methodology include (e) general common method variance bias (given that statistical assessments of this bias are imperfect and can only provide partial reassurance that this bias did not affect our results; Podsakoff et al., 2012), (f) single informant biases (especially at the global level where we solely used self-report measurements), (g) external validity issues (especially at the hypothetical level where participants were asked to imagine their reactions in response to a hypothetical parental apology response), and (h) recollection biases (especially at the situational level where close to one fifth of parental apology responses could not be coded). To limit issues related to these biases, future research could recruit parent-adolescent dyads, film them discussing a situation where adolescents felt that their parent offended them, and code parents' apology response (or lack thereof). Such research could also control for the temporal proximity of the recalled offense (e.g., by asking adolescents to specify when the offense occurred and adjusting for this covariate in the analyses).

Third, our manipulation check could have been more precise and in turn helped us to draw clearer interpretation of some results at the hypothetical level. By assessing the extent to which adolescents perceived that their parent had apologized, we could effectively differentiate the no apology condition from the three apology conditions but may have failed to clearly differentiate the apology conditions. Indeed, although participants considered an apology in the defensive condition (which contained

defensive apology elements) as less of an apology than apologies in the VC and basic conditions (which solely contained victim-centered elements), such differences do not inherently inform on the extent to which the defensive apology is more defensive and less victim-centered than the basic and VC apologies. Similarly, although participants in the basic condition (which had one apology element) and those in the VC conditions (which had three additional apology elements) similarly considered their assigned parental response as an apology, such similarity does inform on the extent to which the VC apology is considered as more comprehensive than the apology in the basic condition. Thus, to differentiate the defensive apology condition from the basic and VC conditions, future research could ask participants to rate the extent to which each apology focuses on the needs of the victim and is defensive. To differentiate the basic condition from the VC conditions, researchers may ask participants to rate the extent to which the apology is comprehensive.

Future research is also needed to better situate parental apologies alongside other need-supportive and need-thwarting parenting behaviors and within broader parenting constructs. Thus far, research suggests that parental VC and defensive apology responses are associated with indicators of healthy parent-adolescent relationships beyond typical autonomy-supportive and autonomy-thwarting parenting behaviors (Robichaud, Schumann, et al., 2024). Yet, given the strong relation between parental apologies and adolescents' basic needs, as well as classic autonomy-supportive and autonomy-thwarting parenting behaviors, research is needed to examine the unicity of parental apologies and their commonalities with other need-supportive and need-thwarting parenting behaviors. We expect parental apology elements to be additional behavioral manifestations of broader need-supportive and need-thwarting parenting styles.

Finally, future research may consider other potential mechanisms at play in the relation between parental apologies and adolescents' developmental outcomes. In line with a recent study on parental apologies anchored in social learning theory (Robichaud, Bureau, et al., 2024), one may argue that adolescents learn important lessons by observing their parents apologize (e.g., the value of taking the perspective of others), which in turn may influence their developmental trajectory (e.g., by fostering their empathy or prosocial behaviors).

Conclusion

The quality of the parent-adolescent relationship is a key determinant of the satisfaction and frustration of adolescents' basic psychological needs, which in turn are integral to their healthy development. Yet, increases in conflicts and tensions between parents and children during adolescence (Smetana & Rote, 2019), paired with the fact that parents are disposed to sometimes interact unconstructively with their adolescents (Mabbe et al., 2018), can make it challenging for parents to maintain high-quality relationships with their adolescents. In this study, we showed that offering VC apologies following parental mishaps could play a key role in restoring adolescents' basic needs in the parent-adolescent relationship, which in turn could foster their individual and social adjustment.

CRedit authorship contribution statement

Jean-Michel Robichaud: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Geneviève A. Mageau:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Hali Kil:** Writing – review & editing, Funding acquisition. **Chloé McLaughlin:** Writing – review & editing. **Noémie Comeau:** Writing – review & editing. **Karina Schumann:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization.

Data availability

Data and R script for our analyses are available on Open Science Framework at DOI: <https://www.doi.org/10.17605/osf.io/8m9qw>.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jecp.2025.106204>.

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