

To intervene or not to intervene? How parents' beliefs influence their achievement-related
parenting practices

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Author note

Study materials, anonymized data, and analytic code are openly available on the Open
Science Framework [<https://osf.io/xtchm/>].

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Abstract

When parents intervene only when needed, children can thrive; when parents “helicopter,” or intervene excessively, children may persist less and become overly dependent. Here we explore a belief that might drive these influential parenting practices - namely, the belief that parents need to intervene to solve problems for their young adult children. In three studies, we probed these beliefs among parents of adolescents and found that the more parents endorsed this general belief, the more they later agreed with specific high-intervention practices targeted at adolescents’ achievement (e.g., doing a school project for one’s adolescent child). Follow-up studies revealed that parents who held the strongest beliefs endorsed high-intervention practices regardless of whether the target adolescent was low- or high-achieving and opted for these practices when making decisions about what they themselves would do. These findings suggest that beliefs about the necessity of parental intervention may shape parents’ achievement-related practices. We discuss the implications of this work for a growing literature on intuitive theories of parenting and suggest directions for future research.

Keywords: helicopter parenting, intuitive theories, beliefs, achievement, adolescence, young adulthood

Word count: X

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In 2019, news broke of the “Operation Varsity Blues” scandal, in which numerous wealthy parents were accused of engaging in illegal actions to secure their child’s admission to elite colleges and universities. These parents staged photoshoots to mislead admissions officers into thinking that their children were successful student-athletes and bribed proctors to give their children extra time on the SAT (or paid to fake the scores entirely). This scandal brought to light the extreme lengths some parents are willing to go to in order to ensure that their child is successful. And while the actions taken by parents in “Operation Varsity Blues” were incredibly extreme, intervening in more moderate, but still excessive, ways to ensure the success of one’s child is not uncommon. Indeed, many high school and college administrators are reporting what appears to be a rise in parental interference in adolescents’ and young adults’ affairs, as documented in recent popular press articles (Miller & Bromwich, 2019; Quealy & Miller, 2019) and books (Lythcott-Haims, 2015). Data from parents themselves also highlights prevalence of such interference: in a nationally representative sample of parents of young adults (ages 18-28 years), 16% of those surveyed reported that they “helped [their adult child] write all or part of a job or internship application,” and 8% reported that they have “contacted a professor or administrator to discuss child’s performance or grades at college” (Quealy & Miller, 2019).

The extremity of these “interventionist” practices raises the question of why some parents opt to engage in them, even with their older, adult children, while others do not. While prior answers to this question have largely focused on demographic factors, such as social class (Ishizuka, 2019), or broad societal changes, such as rising economic uncertainty (Quealy & Miller, 2019) and the increasing importance of attaining a college degree (Pew Research Center,

2014), relatively little work has examined which beliefs might influence whether a parent engages in interventionist practices. The present studies aim to address this question by examining one belief that might drive these practices: namely, the belief that strong parental intervention is *necessary* for a young adult child's success. Prior to describing these studies in detail, we first review relevant literature on this form of parenting (and its effects on children) and discuss the work that inspired our experimental approach.

Over the past few decades, a considerable literature has emerged on parenting styles that involve high levels of parental interference or intervention. Such styles have been referred to as “overparenting” (Segrin, Woszidlo, Givertz, Bauer, & Murphy, 2012), “intensive” parenting (Ishizuka, 2019), “helicopter” parenting (Moilanen & Lynn Manuel, 2019; Padilla-Walker & Nelson, 2012), or “snowplow” parenting (Miller & Bromwich, 2019). While there are some subtle differences between these specific styles, they are all primarily characterized by greater parental involvement than is warranted by the developmental stage and/or needs of the child (Padilla-Walker & Nelson, 2012). Notably, this form parenting has been identified even among parents of adolescents and young adults, even though adolescence and young adulthood are, to a greater extent than preceding developmental periods, marked by increasing autonomy and independence from one's parents (Padilla-Walker & Nelson, 2012). So-called “helicopter” parents, however, place limits on this autonomy by monitoring their adolescent or young adult and excessively intervening in their lives.

Parents may opt for this interventionist approach with good intentions; that is, they want their children to succeed, and they judge “helicoptering” to be the right method for attaining that goal. Notably, however, a growing literature examining the impact of “helicopter” parenting (or similar forms of intensive parenting) has found that such parental interference often backfires in

unintended ways. Recent studies have revealed being the recipient of helicopter parenting during adolescence or young adulthood has been linked to a host of negative outcomes, including lower self-regulation, lower feelings of personal mastery (i.e., feeling “in control” of one’s own life), and greater depressive symptoms (Moilanen & Lynn Manuel, 2019), as well as lower school engagement (Padilla-Walker & Nelson, 2012) and greater entitlement (Fletcher, Pierson, Speirs Neumeister, & Finch, 2020; Segrin et al., 2012). One proposed mechanism for these negative outcomes is that excessive parental intervention communicates to young adults that they are not competent to be successful on their own, which may be detrimental to their ability to navigate life’s everyday challenges independently (Moilanen & Lynn Manuel, 2019). That is, if a young adult’s parent intervenes and makes decisions on their behalf, they might feel that they are less capable of doing these tasks well enough on their own.

Given that helicopter parenting can have these unintended negative consequences for the adolescents and young adults, it is particularly important to consider what could be driving parents’ decisions to engage in these kinds of practices in the first place. That is, why might some parents opt to strongly intervene in order to ensure their child’s success, while other parents opt for a less interventionist approach? As noted previously, earlier work has attempted to answer this question primarily by focusing on demographic factors, such as social class, that might predict parents’ ability to engage in resource- and time-intensive parenting practices (Ishizuka, 2019) or by situating helicopter parenting within the broader context of changing economic conditions (within the United States) that increasingly favor attaining a college degree (Pew Research Center, 2014; Quealy & Miller, 2019). Surprisingly, however, no prior research has examined which *beliefs* might give rise to helicopter parenting, despite decades of literature demonstrating the importance of parents’ beliefs in their schooling-related practices (for a review, see Eccles & Harold, 1993). The present work aims to address this question by examining

whether a belief that strong parental intervention is *necessary* for a young adult child's success predicts endorsement of high-intervention, "helicopter" parenting practices.

This belief touches on a central theme in recent debates about whether or not an interventionist parenting approach is helpful or harmful: some have argued that it "works" in ensuring that children achieve optimal levels of success (Druckerman, 2019), while others seem to think that it "robs" children of opportunities to develop skills necessary for tackling life's problems on their own (Miller & Bromwich, 2019; Siegel & Bryson, 2020). At the heart of this debate seem to be different beliefs about whether parents need to intervene to solve problems for their young adult children. That is, one reason that parents might judge helicopter parenting to be an appropriate method for ensuring their young-adult child's success could be due to their holding a belief that strongly-interventionist practices (herein referred to as "high intervention" practices) are necessary. In contrast, parents who hold the belief that strong intervention is not necessary might be less likely to deem helicopter parenting "appropriate" and instead opt for practices that grant their young-adult child more autonomy (herein referred to as "low intervention" practices). (It is important to clarify that, by "low-intervention practices," we are not referring to parental neglect or minimal contact between parents and their children; rather, we consider "low-intervention" practices to be those that still aim to provide support for the child, but not in a way that involves directly intervening on the child or taking actions on their behalf.)

To explore these possibilities, we developed a new scale to measure parents' beliefs about whether parents need to intervene to solve problems for their young-adult children. This scale was based on a previously-validated, five-item helicopter parenting scale created by Padilla-Walker and Nelson (2012). In their study, Padilla-Walker and Nelson (2012) recruited college students (ages 18-29 years) and at least one of their parents. College students were asked to rate

the extent to which five practices (listed below) were “like their parent,” and parents were asked to rate the extent to which each of these practices was “like them.” (Brackets contain the phrasing for the parent version of the scale.)

- My parent [I] make(s) important decisions for me [my child] (e.g., where I [they] live, where I [they] work, what classes I [they] take).
- My parent [I] intervene in settling disputes I have [my child has] with my [their] roommates or friends.
- My parent [I] intervene in solving problems I have [my child has] with my [their] employers or professors.
- My parent [I] solve any crisis or problem I [my child] might have.
- My parent [I] look for jobs for me [my child] or try to find other opportunities for me [them] (e.g., internships, study abroad).

Measures of internal consistency and exploratory factor analyses suggested that these practices, in both the young-adult and parent versions of the scale, reliably capture parenting behaviors that would be considered especially intrusive or highly interventionist for the young-adult age group (Padilla-Walker & Nelson, 2012). Additionally, parents’ and young adults’ group-level mean scores on this scale showed few differences, suggesting that, on the whole, parents and their young adult children show some agreement about how much these practices are “like them/their parent.” Taken together, these findings suggest that these five practices meaningfully distinguish parents who engage in helicoptering practices with their young-adult children.

Given the demonstrated reliability of Padilla-Walker and Nelson’s (2012) scale, we opted to use their five items as the basis for our own scale. However, instead of measuring the extent to which parents actually employ helicoptering practices themselves, we adapted the items such that they measured parents’ beliefs about whether, in general, parents need to intervene in solving problems for young-adult children. (See the Methods section in Study 1 for more details.) In three

studies, we examined whether these beliefs, among parents of adolescents (ages 14-18 years), predicted agreement with high- or low-intervention practices in the achievement domain. It should be noted parents were asked to consider young adults (ages 18-22 years) while reporting their beliefs, but were asked to consider adolescents (ages 14-18 years) while reporting their agreement with high- and low-intervention practices. This was a deliberate design choice, as we wanted to pick up on beliefs that were not necessarily specific to the age group of the children participants themselves had. By investigating whether parents' beliefs in an older age group (i.e., young adults) predicted their agreement with practices aimed a younger age group (i.e., adolescents), we were able to gain some insight into just how "general" or "core" the beliefs we measured were. The domain-generalty of our belief scale also contributed to our ability to pick up on "general" beliefs. By relating parents' beliefs about intervening in several areas of young-adults lives to their judgments of which practices are appropriate specifically within the achievement domain, we were able to examine the extent to which parents' core beliefs predicted their endorsement of intervention in a specific domain.

We initially predicted that parents' general beliefs about whether parents need to intervene to solve problems for young-adult children would positively predict their agreement with high-intervention practices, but would negatively predict their agreement with low-intervention practices. These predictions were tested in pilot work by asking parents of adolescents to consider four hypothetical, achievement-related scenarios, each involving a generic parent and their adolescent child, and rate, for each scenario, the extent to which they agree that different high- and low-intervention practices would be the "appropriate" parental response. These initial studies found that, consistent with our predictions, there was a significant interaction between parents' beliefs and whether they were rating a high or low intervention response. As predicted, parents' beliefs about whether parents need to intervene to solve problems for young-adult children

positively predicted their agreement with high-intervention practices (e.g., doing a school project on behalf of one's adolescent). However, counter to our initial predictions, parents' beliefs did not predict their agreement with low-intervention practices (e.g., providing a quiet workspace for one's adolescent, but leaving it up to them to complete their schoolwork).

We think that this pattern of findings may have arose for due to a combination of two factors. First, we intentionally did not design our items describing low intervention practices to be as extreme as many of our items describing high intervention practices. That is, while many of our high intervention items involved more extreme parental intervention (e.g., 'taking over' and doing work on behalf of the adolescent), our low intervention items were intended to embody a more autonomy-supportive approach (e.g., encouraging the adolescent to work independently, but being available for help if needed) (Good, 2020). Second, we asked parents to judge what would be appropriate for another (hypothetical) parent to do with regard to their (hypothetical) adolescent, rather than what they would find appropriate to do with their own adolescent. In making these third-party judgments, perhaps high-intervention practices (which were more extreme) only seem appropriate to parents who believe in strong intervention; low-intervention practices, on the other hand, might seem quite reasonable to any parent. It is possible these pilot findings would have aligned to a greater extent with our initial predictions if we had assessed parents' first-person choices (i.e., what they themselves would do). (We examine this possibility in Study 3.)

In Study 1, we aimed to replicate the findings of our earlier pilot work. In this pre-registered study, we hypothesized that, the greater parents' belief that parents need to intervene to solve problems for young-adult children, the more they would agree with high-intervention parenting practices targeted at adolescents. In contrast to our earlier predictions, we expected that

parents' beliefs would not predict their agreement with low-intervention practices. In Study 2, we explored a potential moderator of these relationships: namely, the past achievement of the adolescents described in the hypothetical scenarios. And in Study 3, we asked parents to report what they themselves would do in response to the same achievement-related scenarios explored in Studies 1 and 2 in order to examine whether our initial predictions (for our pilot work) would hold for parents' first-person choices. Together, these studies provide an important first step towards better understanding the beliefs that give rise to "interventionist" parenting styles, such as helicopter parenting.

Study 1

Study 1 (pre-registered: <https://osf.io/xtchm/>) aimed to replicate findings from pilot work (described above) investigating whether parents' beliefs about whether parents need to intervene to solve problems for young-adult children predict their agreement with high- and low-intervention practices aimed at adolescents. We hypothesized that, in models predicting parents' ratings of agreement with different practices, there would be an interaction between scores on our novel belief measure (where a higher score indicate greater endorsement of the idea that parents need to intervene to solve problems for young-adult children) and the intervention level (high vs. low) of the practice. Specifically, we predicted that scores on the belief measure would predict higher agreement with high-intervention practices, but would not predict agreement with low-intervention practices (Good, 2020).

Methods

Participants. Participants were 100 parents recruited from Amazon Mechanical Turk (MTurk) via the CloudResearch platform. Only parents who resided within the United States and

reported at least one child between the ages of 14 and 18 years were eligible to participate. (The latter was measured via a screening question at the beginning of the survey.) One parent was excluded from analyses (per our pre-registered exclusion criteria) for failing a key attention check question; this led to a total sample of $N = 99$. All parents provided their consent electronically prior to their participation.

Demographic characteristics among the final sample of parents ($N = 99$) are reported in Table 1.

Table 1:

Parent demographics for Study 1.

Demographics	Percentage
Number of Children	
1	30.3030303030303
2	46.4646464646465
3	16.1616161616162
4	2.02020202020202
5 or more	5.05050505050505
Parent Gender	
Male	43.4343434343434
Female	55.5555555555556
Prefer Not to Say	1.01010101010101

Parent Education

Some high school	0
High school	6.06060606060606
Some college	24.2424242424242
College degree	50.5050505050505
Some graduate/professional training	3.03030303030303
Graduate or professional degree	16.1616161616162

Parent Income

<20k	3.03030303030303
20-40k	18.1818181818182
40-60k	15.1515151515152
60-80k	22.2222222222222
80-100k	19.1919191919192
100-120k	6.06060606060606
>120k	16.1616161616162

Procedure. Parents were directed to a Qualtrics survey, where they were first asked to report whether they had at least one child between the ages of 14 and 18 years. Parents who answered ‘yes’ to this question then completed a brief ‘bot check’ (i.e., a question intended to screen out non-human responses). Upon passing this check, parents were presented with the

consent form. Those who indicated their agreement to participate then were able to proceed with the survey.

In the first part of the survey, parents were presented with four scenarios, each involving a parent and their adolescent child. Parents were asked to assume that the adolescent child referred to in each scenario was of high-school age (14-18 years-old). Each scenario (described in greater detail below) involved an achievement-related situation, such as the adolescent having to prepare for an upcoming test at school. Following each scenario, parents rated their agreement with four potential ways the adolescent's parent might respond to the given situation. Each item was presented to (and rated by) parents individually. The order in which parents saw the scenarios and their respective items was randomized across participants; within each scenario, the order in which parents saw its respective items was also randomized.

After reading all four scenarios and rating their respective items, parents were given an attention check item and then were presented with our six-item belief scale. Parents first filled out a practice item to familiarize them with our 7-point Likert-type scale. Each of the six belief scale items was then presented to and rated by parents individually. The order in which these items were presented was randomized across participants.

Following the belief scale, parents filled out basic demographic questions. At the end of the survey, parents were fully debriefed, thanked for their participation, and compensated \$3.00 for their time. All of the experimental procedures described here were reviewed and approved by the Stanford University Institutional Review Board (IRB).

Scenarios. Parents were presented with four hypothetical scenarios, each involving a generic parent and their adolescent child (who parents were asked to assume was of high-school

age, ~14-18 years). Each scenario described an achievement-related situation and included either no information about the adolescent's past performance, or information that the adolescent's past performance was mixed (i.e., sometimes they succeeded, and other times they struggled) or ambiguous (i.e., that they had done "quite well"). We specifically chose to include such information so that there would be some uncertainty about the adolescent's future performance. This allowed us to, as an initial step, examine whether parents would agree with high or low levels of parental intervention when the possibility of the adolescent doing well or poorly was left open. The exact language used for each of our scenarios is shown in Table X.

Table 2:

Language used for each of the four scenarios in Study 1.

Scenarios - Full Text

A high-schooler will be taking a test for a class at school. In the past, the student has done well on some tests for this class and not so well on others, and so their parent is unsure of how they are going to do on the upcoming test.

A high-schooler has a project due tomorrow for their science class. For the project, the student needs to build a 3-D model and create a poster describing what they made; both the model and poster will be graded by the teacher and displayed to their entire class. When left to their own devices, the student sometimes completes projects on time, but other times does not.

A few weeks ago, a high-schooler expressed interest in playing piano. Their parent signed them up for piano lessons. After a few weeks of lessons, the high-schooler is doing quite well at playing piano, but has recently begun to say that they find it boring and would like to quit.

Before the start of a new school year, a parent learns that their high-schooler has been assigned to a new, inexperienced teacher for their math class.

High- and Low-Intervention Practices. Following each scenario, parents were presented with either two or four items, each of which described a way in which the adolescent's parent

might respond to the given scenario. Critically, these items varied in terms of whether they involved low or high parental intervention (as described previously). Half of the items following each scenario involved a low-intervention response, and the other half involved a high-intervention response. Parents were instructed to rate each of these items in terms of how much they agreed or disagreed that it was the *appropriate* response to the scenario they just read. Across the four scenarios, parents rated a total of 10 items (5 high-intervention items and 5 low-intervention items).

Parent Belief Scale. We constructed a novel scale to measure parents' beliefs about whether it is necessary for parents to intervene in solving problems for young-adult children. Our six-item scale was based on a previously-validated 5-item helicopter parenting scale developed by Padilla-Walker and Nelson (2012). As noted in the Introduction, parents of young adults (ages 18-29) were asked to rate the extent to which the following behaviors were "like them":

- I make important decisions for my child (e.g., where they live, where they work, what classes they take).
- I intervene in settling disputes my child has with their roommates or friends.
- I intervene in solving problems my child has with their employers or professors.
- I solve any crisis or problem my child might have.
- I look for jobs for my child or try to find other opportunities for them (e.g., internships, study abroad).

In the same study, Padilla-Walker and Nelson (2012) also gave a similar 5-item scale to the young adults themselves, with the items re-phrased slightly in order to measure their perceptions of how much their parent(s) engaged in helicopter parenting. Analyses of young adults' and parents' reports suggested that the scale was reliable: all four versions of the scale (young adults' report of mother, young adults' report of father, mother report, and father report)

achieved high levels of internal consistency (all Cronbach's alpha values $> .76$). No significant differences were found in the average level of helicopter parenting reported by young adults or their parents (with the exception of young adults' reports of their father's helicopter parenting being lower than fathers' self-report).

Evidence from young adults' and parents' reports also provided support for the reliability and validity of the scale. An exploratory factor analysis revealed that helicopter parenting, as measured by this 5-item scale, was correlated with behavioral and psychological control, but loaded onto its own factor, which suggests that the behaviors included in the scale capture a construct distinct from these two other forms of parental control. Moreover, responses on the scale have successfully been used (across several studies) to predict outcomes thought to be associated with helicopter parenting, such as lower parental autonomy granting (Padilla-Walker & Nelson, 2012) and lower feelings of agency in young adults (Moilanen & Lynn Manuel, 2019). Taken together, these findings suggest that this scale reliably captures the construct of helicopter parenting.

To measure parents' beliefs, we adapted Padilla-Walker and Nelson's (2012) scale in three key ways. First, instead of asking parents to report on behavior (i.e., how often they engaged in solving problems for their own young-adult children), our scale asked parents to report on their *beliefs* about whether parents need to engage in these practices. Second, our scale asked parents to report *general* beliefs, rather than about beliefs or behavior specific to their own child. These adaptations were achieved by taking each item from the original scale and using it to produce two generic statements: one asserting that a parent needs to intervene to solve a problem on behalf of their young-adult child (e.g., settle disputes their young-adult child has with roommates or friends) and one asserting that a young adult needs to solve this problem (e.g., a young adult

needs to settle disputes with their roommates or friends). These statements were used as anchors on a 7-point Likert type scale; for each item, parents were instructed to “read the two statements carefully and choose the dot that best captures where [their] own beliefs land[ed] (at either end, or somewhere in the middle).”

Our third adaptation was the addition of a sixth item, which captured another form of parental intervention (i.e., deciding what outside or elective activities one’s young-adult child should participate in) that had not been included in the original scale. Together, these adaptations allowed us to measure parents’ general beliefs about whether parents need to intervene in solving problems for their young-adult children.

Our final six-item parent belief scale consisted of the following items (the [parent] framing is indicated in brackets):

- A young adult [parent] needs to make important decisions [on behalf of their young-adult child] (e.g., where they work, where they live, what classes they should take).
- A young adult [parent] needs to decide [choose] what outside or elective activities they [their young-adult child] should participate in and which ones they should not participate in.
- A young adult [parent] needs to [intervene to] settle disputes they have [that their young-adult child has] with roommates or friends.
- A young adult [parent] needs to solve problems with their [to intervene in solving problems with their young-adult child’s] employers or professors.
- A young adult [parent] needs to solve any crisis or problem that they might have [that their young-adult child has].
- A young adult [parent] needs to look for jobs [for their young-adult child] or try to find other opportunities [for them].

It should be noted that, unlike the scenarios used in our study (see Table 2), this parent belief scale did not pertain only to achievement; rather, it covered multiple domains of the young adult’s life. This allowed us to tap into a core belief about parental intervention that spans across many domains, rather than examining parents’ beliefs solely about the achievement domain.

As in the original scale, we instructed parents to consider young adults (ages 18-22 years) while responding to the items. Parents' scores on each of the six belief items were averaged together to produce a mean "belief score"; the higher a parent's belief score, the greater the extent to which they believe that parents need to intervene to solve problems for their young-adult children.

Data Analysis. Both frequentist and Bayesian approaches were used in data analysis, per our pre-registered analysis plan.

Both our frequentist models (linear mixed effects models) and Bayesian models (Bayesian ordinal regression models) employed the same structure of fixed and random effects. The following variables were entered as fixed effects: participants' belief score (entered as a continuous variable), the type of parental response (either high or low intervention; entered as a categorical variable), the interaction between the two (i.e., the interaction between belief score and parental response type), and scenario. Since a repeated measures design was used, we also included a random intercept of participant (1 | participant).

It should be noted that, while our key hypotheses do not pertain to how participants' ratings of parental practices differ across scenarios, 'scenario' was included as a fixed, rather than random, effect in our models. Pilot work indicated that there were not enough scenarios to achieve a reliable estimate of the variance when scenario was entered as a random effect. This is consistent with literature suggesting that you need at least 5 levels (if not more) of a variable to achieve a precise and robust estimate of variance when it is entered as a random effect (see Gelman & Hill, 2007). (Note that we only had 4 scenarios, which translated to 4 levels of the scenario variable.) Therefore, we decided to account for any potential effect of scenario by entering it in our models as a fixed effect.

Our dependent variable in all of our models was participants' ratings of the potential parental responses to the scenarios. This was entered as a continuous variable in the linear mixed effects model and as an ordinal variable in the Bayesian ordinal regression model.

Per our pre-registered inference criteria, we used the standard $p < .05$ criterion in our frequentist analyses for determining significance of individual predictors. A model comparison approach was also used to determine whether a model containing the interaction between participants' belief score and the type of parental response (high or low on parental intervention) explained significantly more of the variance than a model containing the same predictors (described above) but no interaction term.

In our Bayesian analyses, we used a Bayes factor to determine whether the observed data were more probable under a model containing the interaction between participants' belief score and the type of parental response (high or low on parental intervention) than a model containing the same predictors but no interaction term. We used the decision thresholds specified by Jeffreys (1961). To evaluate the effect of individual predictors, we used 95% credible intervals calculated for posterior point estimates.

Results and Discussion

As noted above, we used a model comparison approach to evaluate the significance of our key predictors. Our first model comparison revealed a significant interaction between belief score and the level of parental intervention (either high or low), $\beta = -0.69$, $SE = 0.07$, $\chi^2(1) = 100.43$, $p < .001$. That is, consistent with our initial predictions, the effect of belief score on parents' ratings of the various parenting practices differed depending on whether the practice involved a high or low level of intervention.

To further examine the effect of belief score within these different intervention levels, we ran two additional model comparisons, one examining parents' ratings of high-intervention practices and one examining parents' ratings of low-intervention practices. The first of these models revealed that, as hypothesized, belief score positively predicted parents' ratings of high-intervention practices, $\beta = 0.49$, $SE = 0.06$, $\chi^2(1) = 35.79$, $p < .001$. The second of these models revealed that belief score negatively predicted parents' ratings of low-intervention practices, $\beta = -0.19$, $SE = 0.06$, $\chi^2(1) = 8.80$, $p = .003$. This finding was not consistent with our initial prediction (based on prior pilot work) that there would be no significant effect of belief score on parents' ratings of low-intervention practices. However, it should be noted that the effect of belief score, while significant for both levels of intervention, was weaker for parents' ratings of low-intervention practices relative to their ratings of high-intervention practices (see Figure #).

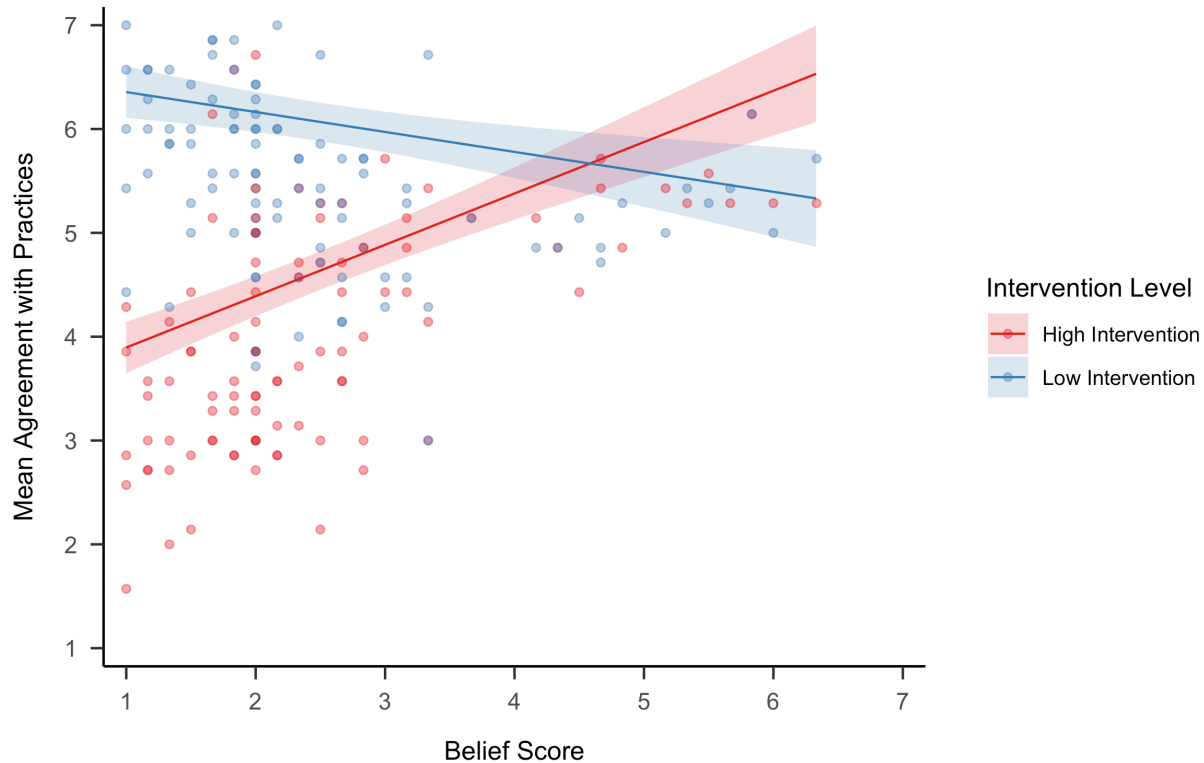


Figure 1. Parents' ratings of high and low intervention practices, plotted as a function of belief score. Points represent individual data.

Bayesian ordinal regression models, fit using default priors, revealed similar findings. A model comparison between a compact model (containing all predictors with the exception of the interaction between belief score and intervention level) and an augmented model (containing all predictors, including the interaction) revealed a “decisive” effect (i.e., a Bayes factor greater than 100; Jeffreys, 1961). This suggests that the observed data were more probable under the model containing the interaction than the model containing no interaction.

Next, we evaluated the parameter estimates representing the mean of the posterior distribution for the effect of belief score on ratings of high- and low-intervention practices, respectively. (The parameter estimates reported here are the mean of the posterior distribution, which is the probability distribution across the possible values of the effect of belief score on

parents' ratings.) As we found in our frequentist analyses, belief score positively predicted parents' ratings of high-intervention practices, as indicated by the positive estimate of the slope ($\beta = 0.30$) and 95% Bayesian credible intervals that do not overlap with 0 (95% CIs = [0.22, 0.38]). Belief score also negatively predicted parents' ratings of low-intervention practices, as indicated by the negative estimate of the slope ($\beta = -0.18$) and Bayesian credible intervals that do not overlap with 0 (95% CIs = [-0.26, -0.10]).

Because our Bayesian models treated the outcome variable (i.e., parents' agreement ratings with the high- and low-intervention practices) as an ordinal, rather than continuous, variable, a conditional effects plot could be constructed. This plot, shown in Figure #, shows the effect of belief score for each individual response option on the 7-point, Likert-type agreement scale, split by intervention level (low vs. high).

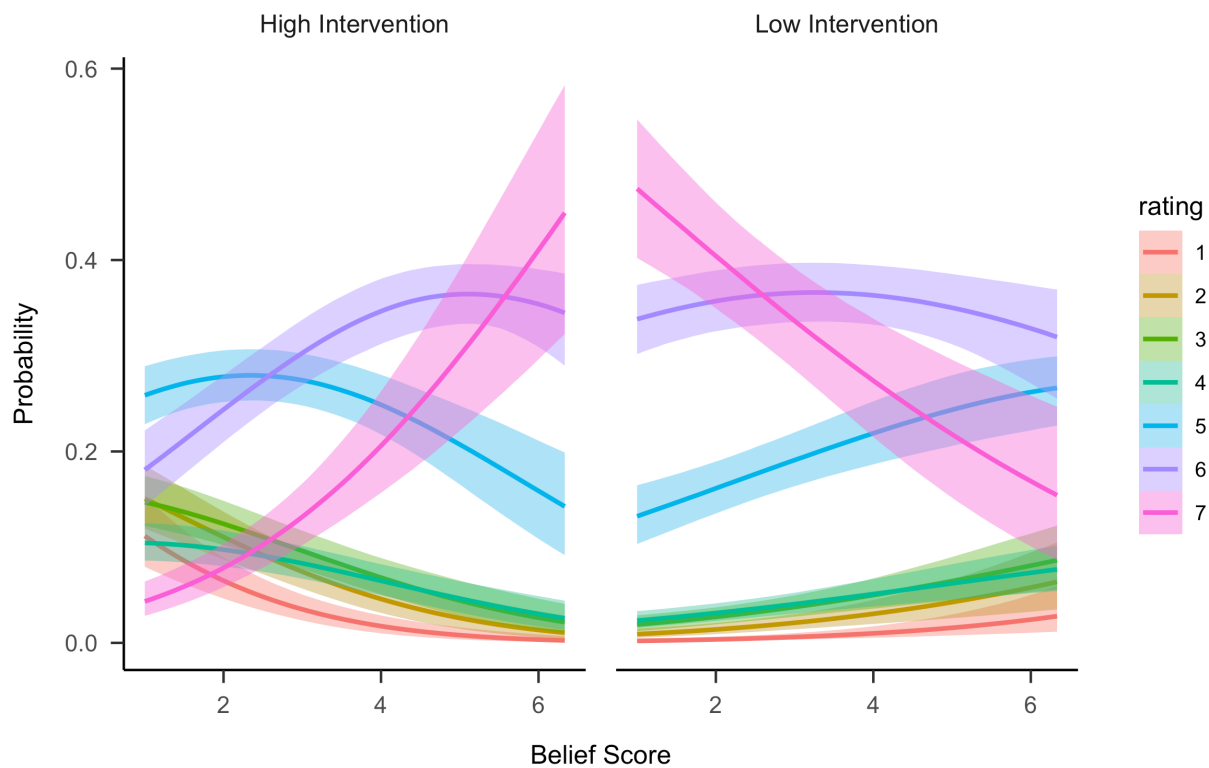


Figure 2. Conditional effects of belief score on parents' Likert-type agreement ratings.

In sum, these findings from both frequentist and Bayesian analyses suggest that our pre-registered hypotheses were largely supported. Among parents of adolescents, higher belief scores (indicating stronger beliefs about whether parents need to intervene to solve problems for young adults) predicted higher agreement with high-intervention practices. The predicted interaction also emerged, such that the relationship between belief scores and agreement with high-intervention practices was significantly more positive than the relationship between belief scores and agreement with low-intervention practices. However, counter to our pre-registered predictions, higher belief scores predicted lower agreement with low-intervention practices. Notably, the latter finding is consistent with the initial predictions we had prior to piloting. It is possible that a significant relationship emerged between belief score and agreement with low-intervention items in this study, but not in our earlier pilot work, because of differences in sample size; the current study recruited 100 parents, while earlier pilot studies only recruited 50 (for each). (Note: After combining the data from two earlier pilots and running an analysis on the resulting sample of $N = 100$, a significant negative effect of belief score on agreement with low-intervention items emerged, suggesting that low sample size may have obscured this effect in the individual pilot samples.) It is also worth noting that, although the effect of belief score on agreement with low-intervention items has been inconsistently significant, it has been consistently weak, both in the current study and in earlier pilot work. This, along with the fact that a greater sample size was used in the present study relative to the pilot studies, might suggest that belief score is simply a weak predictor of parents' agreement with low-intervention achievement-related practices.

The fact that belief score was a stronger predictor of parents' agreement with high-intervention practices (compared to low-intervention practices) raises an important question: which factors might moderate the effect of belief score on parents' agreement with higher or

lower levels of intervention? Given that parents were specifically asked about how appropriate they found these high- and low-intervention practices to be for achievement-related situations, it is possible that other achievement-related factors, such as the past performance of the adolescent, might also matter. That is, parents might adjust the extent to which they agree with high- or low-intervention practices depending on whether the adolescent had done well or poorly in the past. We explored this possibility in Study 2.

Study 2

Like Study 1, Study 2 examined whether parents' beliefs predict their agreement with high- and low-intervention practices in the achievement domain. Critically, however, Study 2 expanded on this question by also exploring whether parents adjust their agreement with high- and low-intervention practices depending on the past performance of the adolescent described in the scenarios. This was achieved by randomly assigning parents to one of three "performance conditions." Across all three conditions, parents read achievement-related scenarios that were almost identical to those seen by parents in Study 1; what varied between conditions was the information provided about the adolescent's past performance in each of the scenarios. Parents in the "positive" performance condition always read that the adolescent had "excelled" or "done very well." In contrast, parents in the "negative" performance condition always read that the adolescent had done "poorly" or had "struggled." (See Table X and Table Y for the exact language used in the positive and negative performance conditions.) Parents in the "ambiguous/mixed" performance condition saw scenarios identical to those shown to parents in Study 1 (since these scenarios were intentionally designed to leave the adolescent's performance ambiguous).

While we did not pre-register hypotheses for this study, we predicted that parents' beliefs would negatively predict parents' agreement with low-intervention items across all three performance conditions, with the strongest relationship emerging in the negative performance condition and the weakest relationship emerging in the positive performance condition. Our reasoning was that, if the adolescent is struggling, all parents may be less willing to stand by and let the adolescent do things on their own; however, parents with high belief scores might be especially likely to agree less with these practices, given their general beliefs that intervention is necessary. In contrast, when the adolescent had performed well in the past, we expected that there would be a very weak relationship between belief score and agreement with low-intervention practices. Since this is a case where the adolescent is already doing very well, we expected that even parents who strongly believe that intervention is necessary might 'step back,' as there is little room for the adolescent to improve.

We also predicted that parents' beliefs would positively predict parents' agreement with high-intervention items across all three performance conditions, with the strongest relationship emerging in the positive performance condition and the weakest relationship emerging in the negative performance condition. Our reasoning here was that, if the adolescent has been performing well, it is likely that only the parents with the highest belief scores would probably still be willing to endorse high-intervention practices (which may seem too extreme for parents with lower belief scores). In contrast, when the adolescent has performed poorly in the past, we expected that even parents who hold weak beliefs about the necessity of intervention (i.e., those with low belief scores) would be more likely to endorse high-intervention practices, as this might be a special case where these parents view such practices as appropriate means for helping the child to improve.

Finally, we predicted that the ambiguous/mixed performance condition would show effects somewhere in the middle of the other two conditions. That is, we expected that we would replicate our findings from Study 1, where there was a weak (but significantly negative) relationship between belief score and agreement with low-intervention practices, and a moderately strong, positive relationship between belief score and agreement with high-intervention practices.

Methods

Participants. Participants were 150 parents recruited from Amazon Mechanical Turk (MTurk) via the CloudResearch platform. Participants were recruited in two rounds of piloting. 50 parents were recruited in Pilot 1 and were all assigned to a positive performance condition; 100 parents were recruited in Pilot 2 and were randomly assigned to either an ambiguous/mixed performance condition or a negative performance condition.

In both pilot studies, inclusion and exclusion criteria were identical to those used in Study 1. A total of six parents (three from each round of data collection) were excluded from analyses for failing a key attention check question; this led to a total sample of $N = 144$ across the two pilot studies. All parents provided their consent electronically prior to their participation.

Demographic characteristics among the final sample of parents ($N = 144$) are reported in Table X.

Table 3:

Parent demographics for Study 2

Demographics	Percentage
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Number of Children

1	36.1111111111111
2	40.2777777777778
3	13.8888888888889
4	6.25
5 or more	3.47222222222222

Parent Gender

Male	53.4722222222222
Female	46.5277777777778

Parent Education

Some high school	0
High school	8.33333333333333
Some college	25.6944444444444
College degree	50.6944444444444
Some graduate/professional training	4.86111111111111
Graduate or professional degree	10.4166666666667

Parent Income

<20k	3.47222222222222
20-40k	11.1111111111111

40-60k	29.1666666666667
60-80k	22.9166666666667
80-100k	14.5833333333333
100-120k	6.94444444444444
>120k	11.8055555555556

Procedure. The procedure in both pilot studies was almost identical to that of Study 1. Parents were directed to a Qualtrics survey and were assigned to either an ambiguous/mixed performance condition or negative performance condition (Pilot 2) or a positive performance condition (Pilot 1). In the ambiguous/mixed performance condition, parents saw four scenarios that were identical to those presented to parents in Study 1. In the negative and positive performance conditions, parents saw the same four scenarios, with modifications to reflect that the high-schooler had always done poorly (in the negative performance condition) or that they had always done well (in the positive performance condition; see below for the exact language used). Following each scenario, parents in all three conditions read and rated the same high- and low-intervention practices presented to parents in Study 1. As in Study 1, each item was presented to (and rated by) parents individually. The order in which parents saw the scenarios and their respective items was randomized across participants; within each scenario, the order in which parents saw its respective items was also randomized.

After reading these four scenarios and rating their agreement with the high- and low-intervention practices, parents who participated in Pilot 2 (i.e., those in the ambiguous/mixed and negative performance conditions) then saw two additional “filler” scenarios; like the earlier scenarios, these “filler” scenarios also involved a hypothetical parent and their high-school age

child and were followed by high- and low-intervention responses the hypothetical parent might have to the situation described. Parents read these scenarios and rated their agreement with the items, and then filled out the same parent belief scale used in Study 1. These “filler” scenarios and items were included to prevent any carryover or priming effects caused by our manipulation (particularly in the negative performance condition) from influencing parents’ responses to the belief scale. (Note that we chose to include these “filler” scenarios and items while designing Pilot 2; since Pilot 1 [i.e., the positive performance condition] was designed and run prior to Pilot 2, parents in Pilot 1 did not see any “filler” items or scenarios prior to filling out the belief scale.) Parents’ responses to the “filler” items were not included in analyses and will not be discussed further.

Following the belief scale, parents in all three conditions were then presented with a failure mindset scale, which consisted of six items (shown individually and in a randomized order) aimed at assessing parents’ beliefs about failure (i.e., whether they believe that failure is enhancing or debilitating).

Following the failure mindset measure, parents filled out basic demographic questions. At the end of the survey, parents were fully debriefed, thanked for their participation, and compensated \$3.00 for their time. All of the experimental procedures described here were reviewed and approved by the Stanford University Institutional Review Board (IRB).

Scenarios. As in Study 1, parents in all three performance conditions were presented with four hypothetical scenarios, each involving a generic parent and their adolescent child (who parents were asked to assume was of high-school age, ~14-18 years). As noted above, scenarios presented to parents in the ambiguous/mixed performance condition were identical to those used in Study 1. The same scenarios were also used in the negative performance condition and in the

positive performance condition; however, information about the high-schooler's past performance was added and/or modified according to condition. See Table X and Table Y for the exact language used in the latter two conditions. (For ease of reading, the language reflecting our key manipulation has been bolded in these tables; no such emphasis was shown to participants.)

Table 4:

Language used for each of the four scenarios in the negative performance condition.

Scenarios - Full Text

A high-schooler will be taking a test for a class at school. In the past, the student has done poorly on previous tests for this class.

A high-schooler has a project due tomorrow for their science class. For the project, the student needs to build a 3-D model and create a poster describing what they made; both the model and poster will be graded by the teacher and displayed to their entire class. In the past, the student has rarely completed projects on time and has received mostly negative feedback from their teacher on the quality of their projects.

A few weeks ago, a high-schooler expressed interest in playing piano. Their parent signed them up for piano lessons. After a few weeks of lessons, the high-schooler is struggling to do well at playing piano. They have recently begun to say that they find it boring and would like to quit.

Before the start of a new school year, a parent learns that their high-schooler, who has struggled in previous math classes, has been assigned to a new, inexperienced teacher for their next math class.

Table 5:

Language used for each of the four scenarios in the positive performance condition.

Scenarios - Full Text

A high-schooler will be taking a test for a class at school. In the past, the student has gotten outstanding grades on all of the previous tests for this class.

A high-schooler has a project due tomorrow for their science class. For the project, the student needs to build a 3-D model and create a poster describing what they made; both the model and poster will be graded by the teacher and displayed to their entire class. In the past, the student has

always completed projects on time and has received praise from their teacher for the excellence of their projects.

A few weeks ago, a high-schooler expressed interest in playing piano. Their parent signed them up for piano lessons. After a few weeks of lessons, the high-schooler is excelling at playing piano, but has recently begun to say that they find it boring and would like to quit.

Before the start of a new school year, a parent learns that their high-schooler, who has excelled in previous math classes, has been assigned to a new, inexperienced teacher for their next math class.

High- and Low-Intervention Practices. Parents were presented with the same high- and low-intervention items used in Study 1. As in Study 1, parents were asked to rate each of these items in terms of how much they agreed or disagreed that it was the *appropriate* response to the scenario they just read.

Failure Mindset Measure. The failure mindset measure was based off of a scale used to measure parents' failure mindsets in Haimovitz and Dweck (2016). The original scale contained six items that assessed parents' beliefs about failure. Three items assessed the extent to which parents thought that failure was enhancing for their own productivity and learning (i.e., held a "failure-is-enhancing" mindset), and three items assessed the extent to which parents thought that failure was debilitating for their own productivity and learning (i.e., held a "failure-is-debilitating" mindset). We adapted these items slightly so that they assessed parents' general beliefs about failure (rather than beliefs that were specific to themselves). The final six items were as follows:

- Experiencing failure enhances performance and productivity.
- Experiencing failure facilitates learning and growth.
- The effects of failure are positive and should be utilized.
- Experiencing failure debilitates performance and productivity.
- Experiencing failure inhibits learning and growth.

- The effects of failure are negative and should be avoided.

Items 4-6 (which represented a “failure-is-debilitating” mindset) were reverse-coded, and all six items were averaged together, resulting in an overall ‘failure mindset’ score. The higher this score, the more parents endorsed a “failure-is-enhancing” mindset.

Data Analysis. Data for this study were analyzed using only a frequentist approach. As in Study 1, throughout all of our analyses, our key dependent variable was participants’ ratings of the potential parental responses to the scenarios (entered as a continuous variable).

Within each performance condition, we constructed linear mixed effects models to examine the effect of belief score and intervention level (as well as their interaction) on parents’ ratings. These models allowed us to examine, within each condition, whether the effect of belief score on parents’ ratings of hypothetical practices differed depending on the intervention level of those practices. These models all employed the same structure of fixed and random effects as the models constructed in Study 1; participants’ belief score, the type of parental response, the interaction between the two (i.e., the interaction between belief score and parental response type), and scenario were entered as fixed effects, and participant (1 | participant) was included as a random intercept.

Within-condition analyses also included two linear mixed effects models (per condition) that separately examined the effect of belief score on parents’ ratings of high- or low-intervention practices, respectively. Each of these models included the same fixed and random effect structure, with belief score and scenario entered as fixed effects, and participant entered as a random effect. The dependent variable in one model was parents’ ratings of high-intervention practices, and the dependent variable in the other model was parents’ ratings of low-intervention

practices. These models allowed us to probe any interactions that arose from the models described above.

Models were also constructed to examine whether belief scores still predict parents' ratings of high- and low-intervention practices after controlling for their failure mindsets. This allowed us to test whether parents' beliefs, above and beyond their failure mindsets, predict their ratings of high- and low-intervention practices.

Lastly, models were constructed to compare across our three performance conditions. These models examined whether there was a significant interaction between belief score and performance condition for parents' ratings of high- and low-intervention practices; we opted to examine ratings of high- and low-intervention items separately rather than including them in a single model due to a lack of power to detect a three-way interaction (between belief score, condition, and intervention level). Thus, we were able to examine whether the effect of belief score on parents' ratings differed by condition within each level of intervention.

As in Study 1, we used a model comparison approach to determine significance of the key predictors.

Results and Discussion

Within-condition analyses revealed that, consistent with our initial predictions, there was a significant interaction between belief score and intervention level within each of the three performance conditions (ambiguous/mixed performance condition: $\beta = -0.54$, $SE = 0.08$, $\chi^2(1) = 42.76$, $p < .001$; negative performance condition: $\beta = -0.56$, $SE = 0.09$, $\chi^2(1) = 33.35$, $p < .001$; positive performance condition: $\beta = -0.87$, $SE = 0.09$, $\chi^2(1) = 82.20$, $p < .001$).

Models examining parents' ratings of high- and low-intervention items separately further revealed that, consistent with our initial predictions, belief score predicted parents' ratings of high-intervention practices in all three conditions (ambiguous/mixed performance condition: $\beta = 0.39$, $SE = 0.09$, $\chi^2(1) = 15.69$, $p < .001$; negative performance condition: $\beta = 0.48$, $SE = 0.09$, $\chi^2(1) = 22.54$, $p < .001$; positive performance condition: $\beta = 0.71$, $SE = 0.08$, $\chi^2(1) = 44.42$, $p < .001$). These effects held even after controlling for parents' failure mindsets (ambiguous/mixed performance condition: $\beta = 0.34$, $SE = 0.10$, $\chi^2(1) = 10.70$, $p = .001$; negative performance condition: $\beta = 0.46$, $SE = 0.11$, $\chi^2(1) = 15.40$, $p < .001$; positive performance condition: $\beta = 0.68$, $SE = 0.11$, $\chi^2(1) = 30.29$, $p < .001$).

Additionally, as predicted, belief score did not predict parents' ratings of low-intervention practices in the ambiguous/mixed performance ($\beta = -0.15$, $SE = 0.09$, $\chi^2(1) = 3.49$, $p = 0.06$) or positive performance conditions ($\beta = -0.15$, $SE = 0.08$, $\chi^2(1) = 3.52$, $p = 0.06$). However, counter to our predictions, belief score also did not predict parents' ratings of low-intervention practices in the negative performance condition ($\beta = -0.08$, $SE = 0.11$, $\chi^2(1) = 0.53$, $p = 0.47$).

Comparing across the performance conditions, we first examined parents' ratings of high-intervention items. As expected, there was a significant interaction between belief score and condition ($\chi^2(2) = 6.41$, $p = 0.04$). Follow-up analyses found that, consistent with our initial predictions, the relationship between belief score and ratings of high-intervention practices was more positive in the positive performance condition than in the ambiguous/mixed performance condition ($\beta = 0.32$, $SE = 0.13$, $t(1008) = 2.48$, $p = 0.014$). However, counter to our initial predictions, there was no difference between the ambiguous/mixed and negative performance conditions ($\beta = 0.09$, $SE = 0.12$, $t(1008) = 0.74$, $p = 0.46$), nor was there a difference between the negative and positive performance conditions ($\beta = -0.23$, $SE = 0.14$, $t(1008) = -1.70$, $p = 0.09$).

We then examined parents' ratings of low-intervention items. Counter to our initial predictions, there were no significant interaction between belief score and condition ($\chi^2(2) = 0.43, p = 0.81$). Follow-up analyses also revealed no differences between conditions in the relationship between belief score and ratings of low-intervention items (ambiguous/mixed vs. positive: $\beta = 0.0001, SE = 0.13, t(1008) = 0.001, p = 0.99$; ambiguous/mixed vs. negative: $\beta = 0.07, SE = 0.12, t(1008) = 0.58, p = 0.56$; positive vs. negative: $\beta = 0.07, SE = 0.14, t(1008) = 0.53, p = 0.60$).

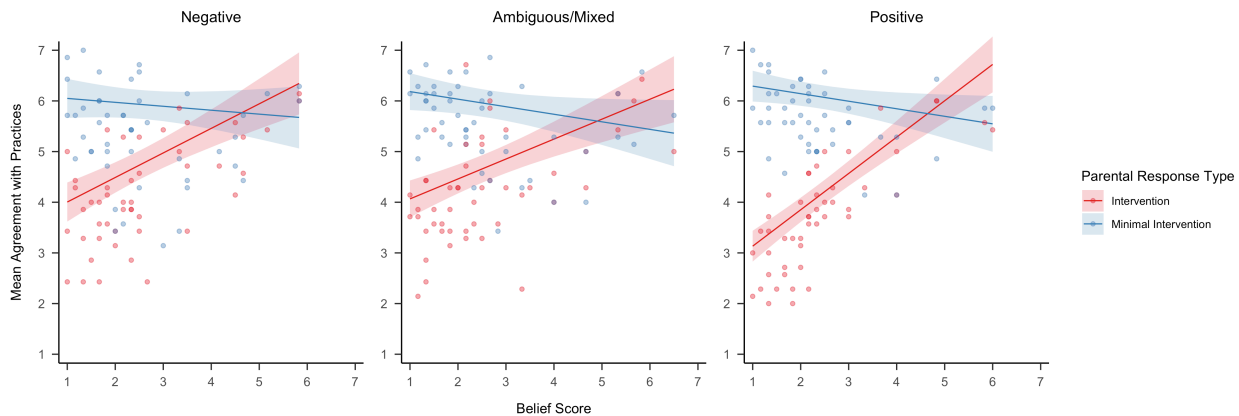


Figure 3. Parents' ratings of high and low intervention practices within each performance condition, plotted as a function of belief score. Points represent individual data.

Taken together, these results largely do not lend support to our initial predictions. Within each performance condition, belief score did positively predict parents' agreement with high-intervention practices; however, belief score did not predict parents' agreement with low-intervention practices in any of the performance conditions. Comparing across conditions, the only predicted difference that emerged was a stronger positive relationship between belief score and agreement with high-intervention practices when the adolescent had done well than when the adolescent's performance was mixed/ambiguous. None of the other predicted differences between conditions were significant.

Notably, while there was no significant difference between the negative and positive performance conditions in the effect of belief score on agreement with high-intervention practices, it is clear this relationship looks quite similar in the negative and ambiguous/mixed conditions, which both look quite different from the positive performance condition (see Figure X, combined plot). Consistent with our initial predictions, much of the adjustment in agreement with high-intervention practices across conditions seemed to occur among parents with low belief scores (i.e., those who did not strongly believe that parents need to intervene to solve problems for young adults). This suggests that, in response to the adolescent doing well, these parents “stepped back” by lowering their agreement with high-intervention practices, which they may have viewed as inappropriate for a high-achieving adolescent. In contrast, parents at the highest end of the belief scale, who had the strongest beliefs about intervention being necessary, did not seem to adjust their endorsement of high-intervention practices depending on the adolescent’s performance, which suggests that their strong beliefs persist even in the face of evidence that the adolescent is doing well.

One finding that ran directly counter to our predictions was the lack of an effect of belief score on parents’ agreement with low-intervention practices when the adolescent had done poorly in the past. Interestingly, there was a trend towards a negative effect in the other two conditions. This pattern of results was surprising, given that we had initially predicted that the relationship between belief score and agreement with low-intervention practices would be strongest in the negative performance condition. It is possible that, when the adolescent’s past performance was poor, parents inferred that the adolescent had little motivation to do well, and that not intervening would not necessarily make things worse, as it could in the other conditions. (Although it should be noted that there were no significant differences between conditions in the effect of belief score on agreement with low-intervention practices. The lack of a significant difference between the

ambiguous/mixed and negative performance conditions in particular could suggest that parents inferred that adolescents with ambiguous or mixed past performance were struggling, similar to the adolescents described in the negative performance condition.)

Overall, the pattern of findings suggest that, in general, parents do not seem to adjust their agreement with low-intervention practices in response to the adolescent's past achievement. While parents with low belief scores do seem to adjust their agreement with high-intervention practices when those practices are aimed at an adolescent who has done well in the past, parents with high belief scores, in contrast, do not seem to calibrate at all. One possible explanation for this set of findings is that the performance manipulation simply was not strong enough. It is also possible, however, that a different set of findings would have emerged if we had asked parents about what they themselves would do (rather than what is appropriate for another parent to do). Indeed, a first-person measure could better distinguish between parents with different beliefs: while parents with lower belief scores might opt for a low-intervention response themselves, parents with higher belief scores might opt for a high-intervention response if forced to choose (even though they showed high agreement ratings with both forms of intervention when making judgments about what is appropriate for third-parties). We explored this possibility in Study 3, focusing only on the ambiguous/mixed performance condition as a first step.

Study 3

Study 3 explored how beliefs about whether parents need to intervene to solve problems for young adults influence parents' own choices about what kinds of practices they would engage in with an adolescent child. We investigated this question by first presenting parents with the same scenarios and high- and low-intervention practices used in Study 1; as in Study 1 (and the

ambiguous/mixed performance condition of Study 2), parents provided ratings of the extent to which they agreed that each practice was the “appropriate” response to the given scenario. Following this, parents were then provided with the same scenarios and practices again, but were asked to select which practice they themselves would engage in if they were the parent in the given scenario. This design allowed us to not only replicate Study 1 and the ambiguous/mixed performance condition of Study 2, but it also allowed us to examine whether parents’ beliefs would map on to their first-person choices.

Prior to outlining our predictions, it should be noted that we obtained slightly different results for parents’ third-party judgments in Study 1 and the ambiguous/mixed performance condition of Study 2 (which were identical). Specifically, belief score negatively predicted parents’ agreement with low-intervention practices in Study 1, but not in the ambiguous/mixed performance condition of Study 2 (although there was a trend towards significance, $p = 0.06$). Given these mixed results, we made predictions similar to those made in Study 1. That is, we predicted that belief score would positively predict parents’ agreement with high-intervention practices and that there would be a significant interaction between belief score and intervention level (high vs. low). However, we did not make a specific prediction about the effect of belief score on parents’ agreement with low-intervention practices; we expected that, if an effect did arise, it would be negative, but weak.

For parents’ first-person choices, we predicted that, the stronger a parent’s belief about whether parents need to intervene to solve problems for young adults, the less likely they would be to opt for low-intervention practice, and the more likely they would be to opt for a high-intervention practice. We did not make specific predictions about parents’ likelihood of choosing specific responses (e.g., of choosing one specific high- or low-intervention practice over another).

Methods

Participants. Participants were 75 parents recruited from Amazon Mechanical Turk (MTurk) via the CloudResearch platform. Inclusion and exclusion criteria were identical to those used in Studies 1 and 2. A total of five parents were excluded from analyses for failing a key attention check question; this led to a total sample of $N = 70$. All parents provided their consent electronically prior to their participation.

Demographic characteristics among the final sample of parents ($N = 70$) are reported in Table X.

Table 6:

Parent demographics for Study 3

Demographics	Percentage
Number of Children	
1	34.2857142857143
2	47.1428571428571
3	11.4285714285714
4	5.71428571428571
5 or more	1.42857142857143
Parent Gender	
Male	61.4285714285714
Female	38.5714285714286

Parent Education

Some high school	0
High school	8.57142857142857
Some college	18.5714285714286
College degree	47.1428571428571
Some graduate/professional training	4.28571428571429
Graduate or professional degree	21.4285714285714

Parent Income

<20k	0
20-40k	18.5714285714286
40-60k	25.7142857142857
60-80k	32.8571428571429
80-100k	7.14285714285714
100-120k	8.57142857142857
>120k	7.14285714285714

Procedure. The procedure was almost identical to that of Study 1. Parents were directed to a Qualtrics survey, where they were presented with the same four scenarios shown to parents in Study 1 (and in the ambiguous/mixed performance condition in Study 2). Following each scenario, parents read and rated the same high- and low-intervention practices presented to parents in Studies 1 and 2. As in all prior studies, each item was presented to (and rated by)

parents individually. The order in which parents saw the scenarios and their respective items was randomized across participants; within each scenario, the order in which parents saw its respective items was also randomized.

After reading these four scenarios, rating their agreement with the high- and low-intervention practices, and filling out an attention check item, parents were asked to make first-person judgments about what they would do in each of the four scenarios they had just read. Parents were presented with the same four scenarios; each scenario was again presented individually, and scenarios were again presented in a randomized order. (Note that, because the order of the scenarios was randomized a second time, parents may have seen them in a different order than they had seen them in previously.) Following each scenario, parents were asked: “If *you* were the parent in this scenario, which would you do?” The options with which parents were provided were the same high- and low-intervention items they had rated earlier; however, this time, all items were shown together (i.e., on a single page of the survey) and in a randomized order. Parents saw four of these questions in total, one corresponding to each scenario, and they were all forced-choice, meaning that only one practice could be selected for each.

After reading each scenario again and indicating which response they themselves would choose, parents filled out the six-item parent belief scale. As in Study 2, they were also presented with a failure mindset measure. (Note that, because controlling failure mindsets did not change the pattern of findings in Study 2, parents’ failure mindsets were not included in analyses for this study and will not be discussed further.)

Parents then filled out basic demographic questions. At the end of the survey, parents were fully debriefed, thanked for their participation, and compensated \$3.00 for their time. All of the

experimental procedures described here were reviewed and approved by the Stanford University Institutional Review Board (IRB).

Data Analysis. As in Studies 1 and 2, linear mixed effects models were constructed to examine whether parents' belief scores predicted their agreement ratings with the high- and low-intervention items. (Please note that their agreement ratings, which were elicited the first time they saw the four scenarios, were judgments of whether certain practices would be "the appropriate response" to the given scenario.)

Bayesian multinomial logistic regression models were used to assess whether belief scores predicted whether parents opted (when asked what they themselves would do if they were the parent in the given scenario) for a high-intervention or low-intervention practice. In addition, multinomial logistic regression models were used to assess the probability of selecting each option as a function of belief score.

Results and Discussion

Analyses examining parents' agreement ratings revealed a significant interaction between belief score and intervention level ($\beta = -0.69$, $SE = 0.07$, $\chi^2(1) = 96.33$, $p < .001$; see Figure #). Additional models revealed that, as predicted, belief score positively predicted parents' ratings of high-intervention practices ($\beta = 0.62$, $SE = 0.07$, $\chi^2(1) = 49.52$, $p < .001$) and did not predict parents' ratings of low-intervention practices ($\beta = -0.07$, $SE = 0.07$, $\chi^2(1) = 0.92$, $p < .34$).

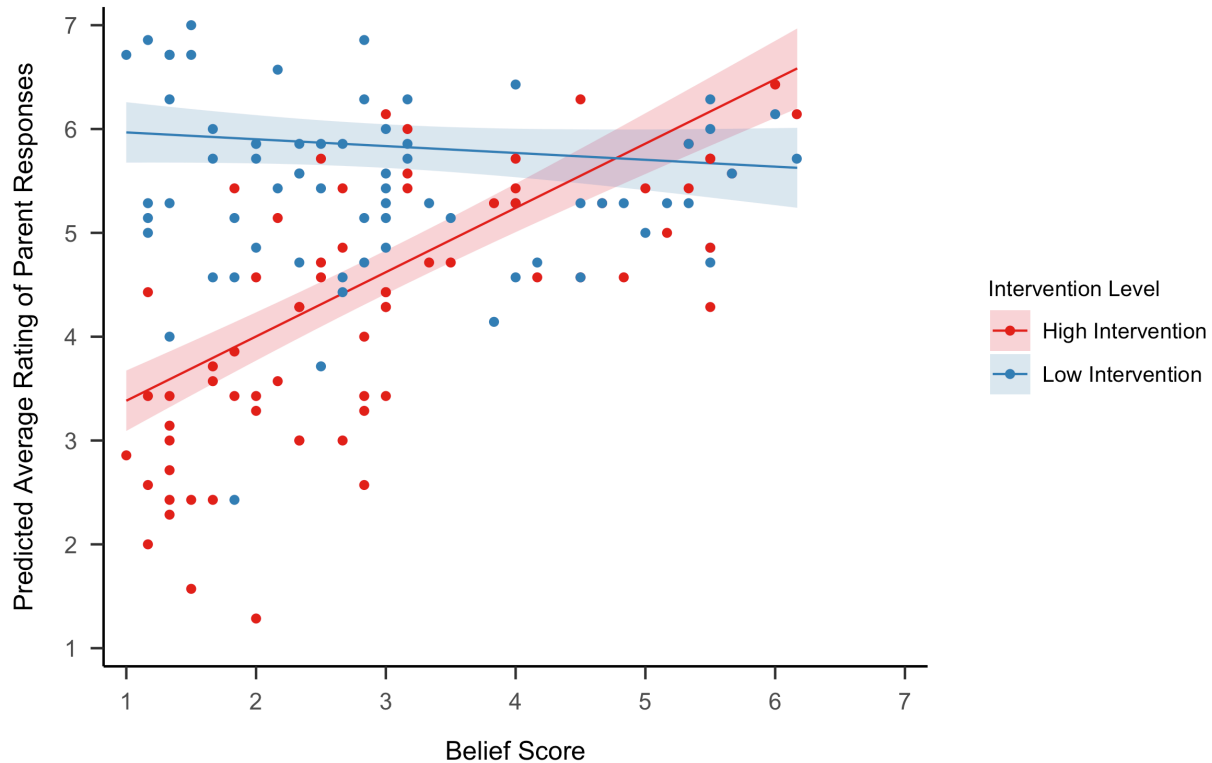


Figure 4. Parents' ratings of high and low intervention practices, plotted as a function of belief score. Points represent individual data.

Turning to parents' own choices of what they would do, Bayesian multinomial logistic regression models revealed that, as belief score increased, parents were less likely to opt for a low-intervention practice; this was true for the test preparation scenario ($\beta = -0.41$, 95% CIs = $[-0.79, -0.06]$), the school project scenario ($\beta = -0.53$, 95% CIs = $[-0.97, -0.11]$), and the assignment to an inexperienced teacher scenario ($\beta = -0.52$, 95% CIs = $[-0.93, -0.15]$). The only scenario for which belief score did not predict parents' choice of a high- or low-intervention practice was the scenario in which the high-schooler considers quitting piano lessons ($\beta = -0.21$, 95% CIs = $[-0.57, 0.15]$). See Figure # for Bayesian conditional effects plots, which show the probability of choosing a high- or low-intervention practices as a function of belief score.

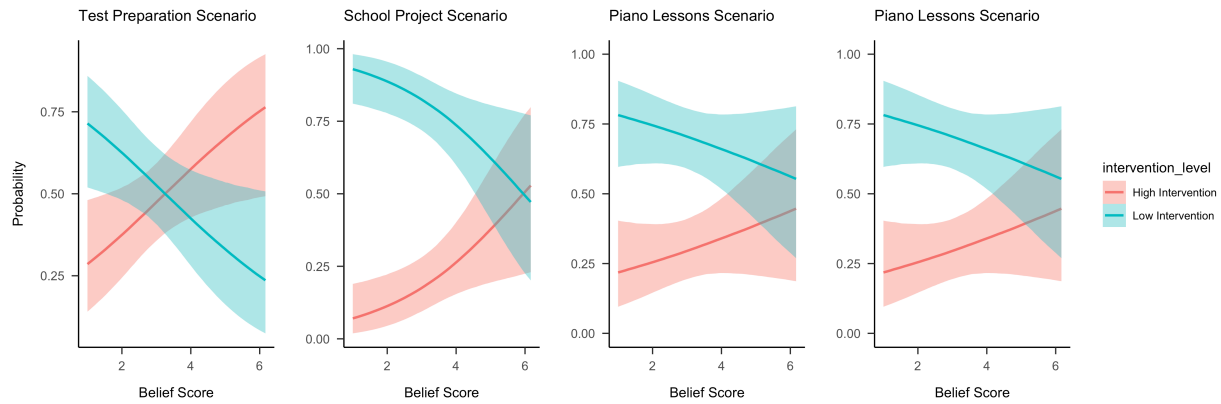


Figure 5. Conditional effects of intervention level for parents' first-person choices.

Frequentist multinomial logistic regression models were also used to calculate the probability of selecting each possible high- and low-intervention practice as a function of belief score. These probabilities are visualized (for the three scenarios that had more than two practices to choose from) in the plots below.

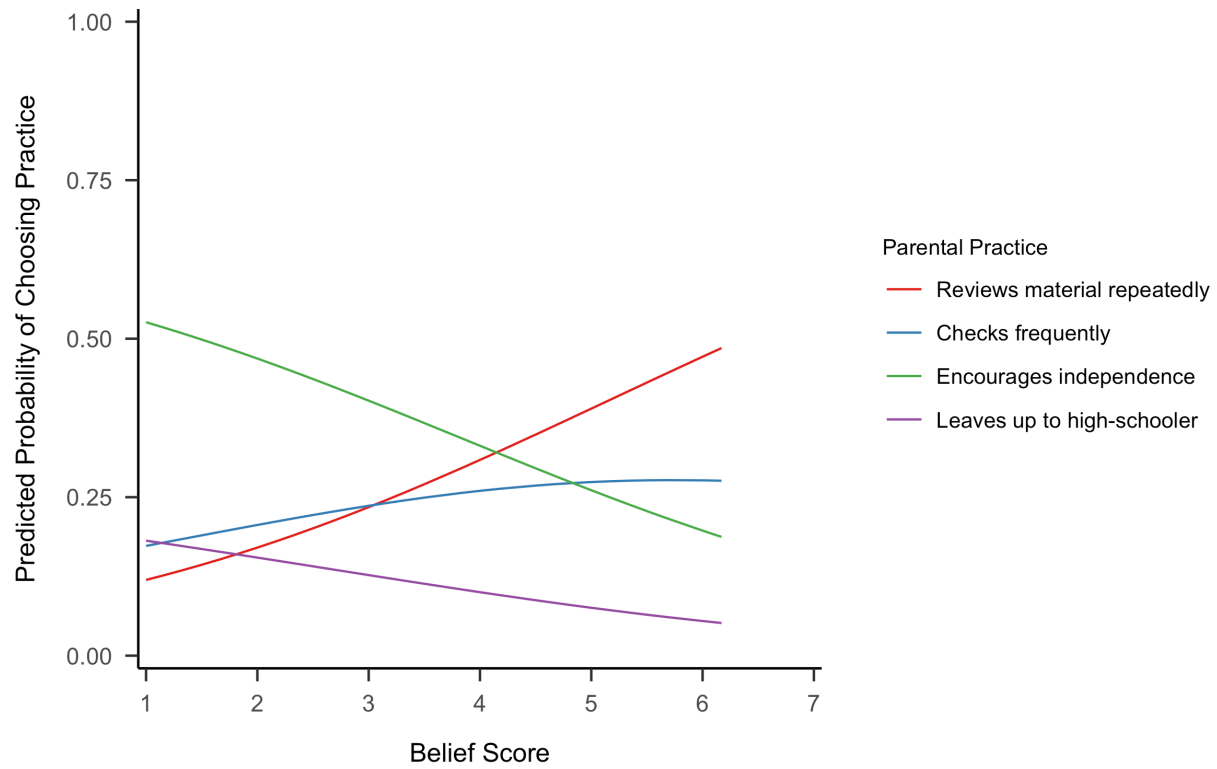


Figure 6. Probability of opting for each practice in response to Scenario 1, plotted as a function of belief score.

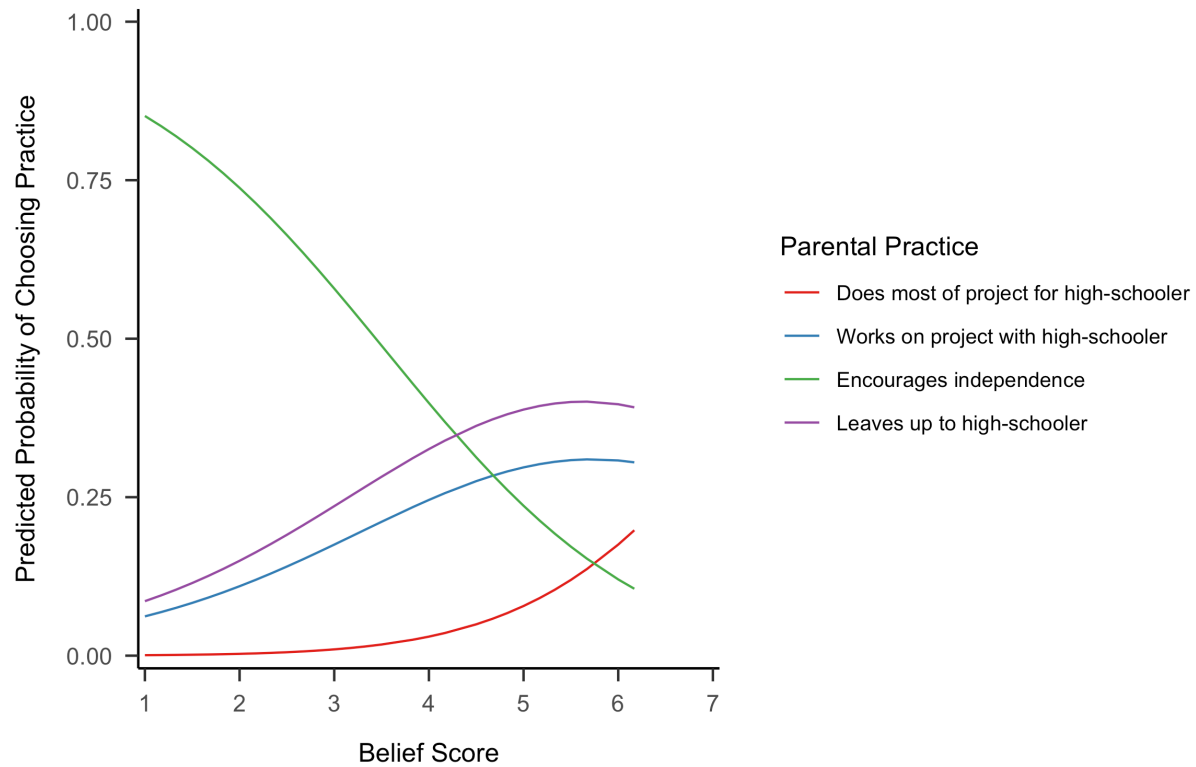


Figure 7. Probability of opting for each practice in response to Scenario 2, plotted as a function of belief score..

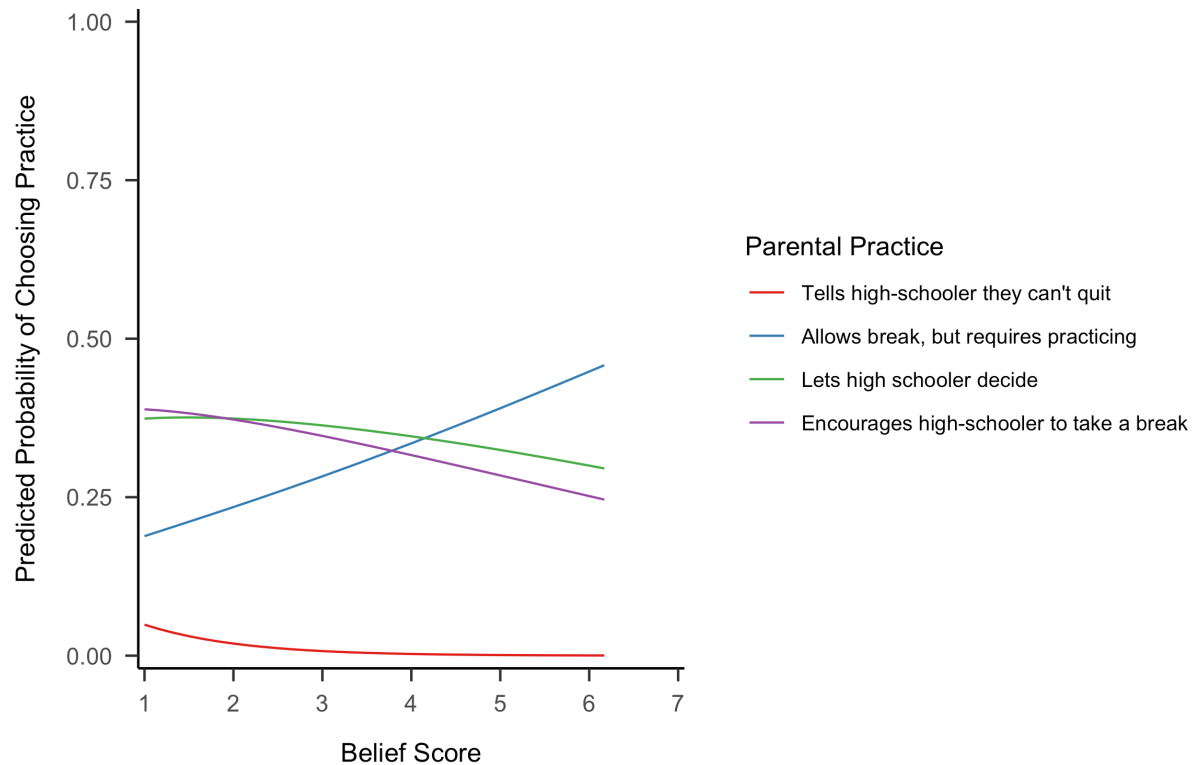


Figure 8. Probability of opting for each practice in response to Scenario 3, plotted as a function of belief score.

Overall, these findings largely support our initial hypotheses. Two of the main findings from Study 1 and the ambiguous/mixed performance condition of Study 2 were replicated yet again. For parents' agreement ratings for both high- and low-intervention items, there was a significant interaction between belief score and intervention level, such that the effect of belief score on parents' agreement was significantly more positive for high-intervention practices compared to low-intervention practices. Additionally, belief score positively predicted parents' agreement with high-intervention practices. The fact that these two findings were replicated across three studies suggests a robust relationship between parents' beliefs about whether parents need to intervene in solving problems for young adults and their agreement with high-intervention, "helicoptering" practices.

On the other hand, belief score did not predict parents' agreement with low-intervention practices. This was not entirely inconsistent with our expectations; although there had been a significant effect of belief score in Study 1, it was quite weak, and no significant effect had emerged in the ambiguous/mixed performance condition of Study 2. While the significance of the effect was not consistent across these three studies, what was consistent was that the relationship appeared to be weakly negative. That is, although it seemed that, to a small extent, parents with stronger beliefs showed less agreement with low-intervention practices, parents in general reported high agreement with these practices.

As argued previously, it is possible that even parents with high belief scores agreed highly with low-intervention practices due to these practices seeming "reasonable" for another parent to engage in. Our first-person results indirectly speak to this possibility: while parents with low belief scores were more likely to opt for low-intervention practices, parents with high belief scores were more likely to opt for high-intervention practices. (The only scenario where this pattern did not hold was the scenario in which the adolescent wishes to quit taking piano lessons; belief scores did not predict parents' choices in this case.) This could suggest that, while parents with high belief scores endorse low-intervention practices for other parents, they themselves might be less willing to opt for such practices when they could intervene more strongly.

General Discussion

The current work aimed to explore the beliefs underlying helicopter parenting, a style of parenting characterized by excessive parental intervention in the lives of (even young adult) children. Across three studies, endorsement of using high-intervention, "helicoptering" parenting practices with adolescents in achievement contexts was predicted by beliefs about whether

parents need to solve problems for young adult children. This finding was robust: it emerged regardless of the adolescent's past achievement or whether parents were making first-person choices (about what they themselves would do) vs. third-party judgments (about what would be appropriate for another parent to do). On the other hand, parents' beliefs did not consistently predict their agreement with low-intervention, autonomy-granting practices. In general, parents showed high agreement with these practices, although Study 1 did provide some evidence that parents who believe intervention is necessary might agree with low-intervention practices slightly less (and parents' first-person choices in Study 3 suggest that these parents may not opt for such practices themselves). Taken together, these results provide the first evidence to suggest that general beliefs about whether parents need to intervene to solve problems with young adults predict parents' agreement with high-intervention, achievement-related practices aimed at adolescents.

It is notable that, across our three studies, parents' domain-general beliefs about an older age group (i.e., young adults, ages 18-22 years) predicted their agreement with, and choice of, domain-specific practices targeted at a younger age group (i.e., adolescents, ages 14-18 years). While the beliefs explored here are likely not the only ones that influence parents' endorsement of certain achievement-related practices, it is possible that they comprise part of a broader intuitive theory of parenting that influences how parents make decisions in achievement contexts (and beyond). Intuitive theories are coherent systems of beliefs and assumptions that guide our reasoning about how the world works as well as our decisions about how we should intervene upon the world to achieve our goals (Carey, 1995; Gelman & Legare, 2011; Gerstenberg & Tenenbaum, 2017). In many ways, parents' beliefs in the current studies operated like an intuitive theory: they guided parents' judgments of which practices would be appropriate, and they influenced parents' own choices about what they themselves would do if presented with these

specific achievement-related scenarios. The present findings join a growing literature on intuitive theories of parenting in demonstrating that there are meaningful differences between parents in their beliefs and attitudes about parenting that can be linked to differences in parents' own choices of practices (Hembacher & Frank, 2018; Trommsdorff, Cole, & Heikamp, 2012).

The possibility that the beliefs explored in the current studies may have operated as part of a broader intuitive theory of parenting also provides one possible explanation for our findings in Study 2. In this study, parents with weaker beliefs seemed to adjust their agreement with high- and low-intervention practices to some extent depending on whether the adolescent was high- or low-achieving, but parents with strong beliefs showed very little adjustment, even when the adolescent was high-achieving. It is possible that this pattern of results arose because parents interpreted the information about the adolescent's past performance through the lens of their theory; that is, parents may have assumed that the parent's past intervention (or lack thereof) had led to that performance outcome in the first place. For example, parents with higher belief scores may have assumed that the high-achieving adolescent had excelled in the past due to their parent having intervened strongly; therefore, continuing to intervene highly might seem like the most appropriate response. In contrast, parents with lower belief scores may have assumed that the high-achieving adolescent had performed well on their own and that the parent should continue to intervene minimally. In these ways, parents' interpretation of the scenarios themselves may have been influenced by their own beliefs (or theories).

Although information about the adolescent's past performance largely did not moderate the effect of parents' beliefs on their agreement with high- and low-intervention practices, it is likely that, outside of an experimental setting, many factors interact with (or even directly influence) parents' beliefs. One such factor is the age or developmental stage of the child. While

the current work focuses on primarily on adolescents and young adults, parents might hold different beliefs about how much intervention (or which kinds of intervention) are appropriate for younger children. Since younger children often need more assistance, it is reasonable to assume that more parental intervention may in fact be necessary. In fact, literature on scaffolding suggests that small amounts of intervention, adjusted to suit the needs of the child, can be beneficial for children's learning and skill development; this is known as "contingent shifting" (Carr & Pike, 2012; Wood, Wood, & Middleton, 1978). Notably, however, the scaffolding literature has also shown that intervening too much, even at younger ages, can still have negative consequences for children. That is, when parents intervene beyond what is called for, children often show worse performance than when parents intervene contingently (Carr & Pike, 2012; Wood et al., 1978). There is also evidence that "taking over" and doing a task on behalf of a child lowers their persistence (Leonard, Martinez, Dashineau, Park, & Mackey, 2019). These findings raise several questions when considered in light of the current findings. Do some parents "adjust" or "calibrate" their beliefs about how much parental intervention is appropriate as their child ages, while others do not? Could strong beliefs about the necessity of intervention, even for young adult children, result from a failure to "update" one's beliefs in response to developmental changes? Such questions point toward important directions for future research.

In considering the results of the current studies, it should also be highlighted that parents who strongly believed that parents need to intervene to solve problems for young adults were a minority in our sample; the vast majority of parents had quite low scores on the belief measure. Still, we think it is significant to consider the implications of these beliefs, especially in light of recent research suggesting that, within the United States, time- and resource-intensive, child-oriented parenting is increasingly becoming culturally normative (Ishizuka, 2019). While access to certain kinds of resources (e.g., financial resources) might limit the most extreme forms of

intervention to parents of higher social classes (as we saw in the Varsity Blues scandal), it is still possible that a shift in cultural norms towards more intensive forms of parenting could also shift parents' beliefs about the extent to which they need to intervene for their child to be successful. Therefore, it remains important for future research to continue exploring not only these parental beliefs and their influence on parenting practices, but also their implications for children's beliefs, motivation, and achievement.

While the findings presented here provide an important first glimpse into the beliefs that underlie interventionist, "helicopter" parenting practices, they must also be considered alongside the limitations of the present research. First, all three of our studies relied exclusively on hypothetical scenarios involving a generic parent and their adolescent child, and we asked parents to make judgments about what would be appropriate for another parent to do. These were deliberate design choices, as we wanted to be able to assess judgments that were not specific to participants' own situation with their adolescent child. However, this design does not allow us to draw conclusions about whether parents' beliefs map on to the practices they use with their own children. Even in Study 3, when we did elicit parents' own choices about what they themselves would do in these scenarios, we relied only on self-report, which also limits our ability to draw conclusions about what these parents would actually do if faced with these situations. Additionally, the forced-choice nature of these first-person choice measures prevents us from determining the strength of parents' preferences for high- or low-intervention practices. Future research should examine the extent to which parents' beliefs relate to their actual parenting practices as well as the extent to which they prefer to use high- versus low-intervention practices with their own child.

Additionally, while we used past literature on helicopter parenting to develop the “high” and “low” intervention practices used in these studies, future work should further explore the extent to which parents actually view these practices as being high or low on parental intervention. It is possible that, even within these two categories, there was some variation; that is, parents might have viewed some “high” or “low” intervention practices as more extreme than others. Finally, it is worth noting that, while our results across all three studies provide support for the reliability of our parent belief scale, the scale itself may have contained some ambiguity. That is, for each item on the scale, parents were shown a 7-point, Likert-type scale, anchored by two statements (one asserting that parents need to solve problems for young adults, and one asserting that young adults need to solve these problems). The 5 response options in the middle of these statements were unlabeled, and so it is possible that there was some variation among parents in how they construed these options. Some parents may have construed these options as representing the belief that solving problems (or making decisions) should be done jointly by the young adult and their parent. Other parents may have assumed that these options reflected the belief that sometimes young adults need to solve problems on their own, and sometimes parents need to solve these problems for young adults. Since we were most interested in where parents’ own beliefs landed relative to the extremes, we do not think that these different construals would necessarily influence our broad conclusions. Nevertheless, future work should explore these interesting possibilities and examine how these different interpretations might influence parents’ judgments.

Taken together, the current work suggests that one important belief underlying parents’ agreement with practices that involve different levels of parental intervention is the belief that parents need to intervene to solve problems with young adults. This effect emerged across three studies, providing strong evidence for the robust effect of these beliefs on parents’ judgments of

how appropriate it is to use high-intervention practices with adolescents in achievement-related scenarios. Our studies provide exciting new evidence that informs our understanding why some parents might engage in helicopter parenting (and similar forms of intensive parenting). Our findings also contribute to a growing literature intuitive theories underlying parenting decisions and motivate several new directions for future research, including relating parents' beliefs to their actual practices and examining how these parental beliefs might change in response to developmental changes in the child. We hope that our work will prompt further investigation into the rich and fascinating area of parents' beliefs and intuitive theories.

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