

HOW PARENTS' AND TEACHERS' HELP CAN SEND MESSAGES ABOUT  
CHILDREN'S ABILITIES

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## **Abstract**

Help is ubiquitous in everyday life, especially for children. The help children receive from adults - especially parents and teachers - is critical in shaping their motivation to learn and achieve. Children often learn best when help is adjusted to their needs; but some adults frequently step in and provide more help than is necessary. Why might adults, particularly parents, provide this “intrusive” type of help? And what messages do adults think intrusive help might convey about children’s competence? Chapter 1 outlines what we already know about intrusive help from past research - that it can demotivate children - and explores why parents might engage in it as well as what messages it might send about children’s abilities. Chapter 2 investigates one potential driver of an intrusive approach: namely, parents’ beliefs about the need to make decisions and solve problems for even young-adult children. We find that these beliefs influence parents’ agreement with using highly (vs. less) intrusive practices. In Chapter 3, we shift our focus on help from parents to help from teachers, exploring how different amounts of help - including intrusive help - from teachers might convey messages about children’s abilities (as well as whether their abilities can be improved). We then bring these two lines of work together in Chapter 4 to examine whether parents who tend to endorse intrusive help recognize that such help can convey negative messages. Chapter 5 suggests directions for future research and discusses the implications of this body of research for both the literature on achievement motivation as well as real-world efforts to engage and motivate children in academic contexts. Taken together, this work adds to our understanding of help as an important cue that shapes children’s motivation to learn.

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## Chapter 1: Introduction

Giving and receiving help is ubiquitous in everyday life. Children and adolescents in particular frequently encounter problems or issues they initially cannot solve on their own. For example, imagine a child is trying to complete a new type of puzzle they have never seen before. In situations like this, help from someone else is often beneficial – not only for achieving the desired outcome (i.e., completing the puzzle successfully), but also for learning how to tackle these problems independently in the future. But sometimes help can backfire. Indeed, providing more help than is necessary can *hinder* the help recipient and potentially reduce their ability and willingness to take on challenges on their own. Despite this, adults - including parents and teachers - sometimes still engage in “intrusive” forms of help where they step in and provide help above and beyond what a child actually needs in order to learn or to perform the task.

My dissertation explores three questions that arise from this phenomenon. First, what beliefs might predict whether adults, particularly parents, endorse intrusive help as an appropriate response in achievement-related scenarios? Second, how do adults construe intrusive help compared to other forms of help? Specifically, what messages do they think these different types of help might send about a child’s abilities? Finally, are those who tend to endorse intrusive help less likely to think it conveys negative messages about ability? Or do they recognize that intrusive help can send negative messages, but still think it is appropriate to engage in it?

By investigating these questions, I hope to shed light on why some adults might endorse intrusive help and why others might not agree with this intrusive approach. This work could provide key insights into some of the mechanisms that drive intrusive help

and even inform strategies for how we might encourage adults (especially teachers and parents) to provide more adaptive or constructive forms of help to younger individuals.

Below, I review literature relevant to these questions. I begin by discussing how help from some of the most influential adults in children and adolescents' lives - parents and teachers - impacts their motivation. Within this discussion, I define the concept of intrusive help and outline past evidence suggesting that it can demotivate learners. I focus mostly on intrusive help from parents, as there is a rich literature on how such help from parents can have negative consequences for motivation, learning, and mental health. I then discuss what might be driving some adults to engage in intrusive help. First, I explore how adults in general might construe instances of intrusive help, with a specific focus on the messages adults think intrusive help might send about those receive it as well as those who give it. Then, I consider the beliefs that might drive parents in particular to still provide intrusive help to children and adolescents, despite its potentially negative impacts. Finally, I conclude with a summary of the studies in my dissertation and how they address the key questions outlined above.

### **How does help from teachers and parents impact children and adolescents?**

#### ***Contingent help and scaffolding***

Teachers and parents are both incredibly influential in shaping children and adolescents' learning and motivation. One important way in which they do so is through the help they provide (Brophy, 1986; Desforges & Abouchaar, 2003; Jansen, Meyer, Wigfield, & Möller, 2022). Help from both teachers and parents is often most effective when it is adjusted to the child's needs (Wood, Wood, & Middleton, 1978). This has perhaps been made most clear by the extensive literature on scaffolding (for a review, see

Mermelshtine, 2017). Scaffolding describes a process in which someone who is helping another individual - such as a teacher or parent helping a child - adjusts the help they provide based on the help recipient's performance or ability (Wood, Bruner, & Ross, 1976; Wood et al., 1978). For example, if a parent is helping their child with a homework assignment, they might start by asking guiding questions or providing suggestions for where to begin. As the child reaches a point where they are starting to tackle the assignment on their own, the parent might step back and only provide more input if asked; only if the child seems to be genuinely struggling should the parent step in and provide more assistance.

When parents and teachers use this contingent approach to providing help, children and adolescents benefit (Mermelshtine, 2017; van de Pol, Volman, & Beishuizen, 2010). Scaffolding is associated with a number of positive outcomes throughout the schooling years, including better reading (Dieterich, Assel, Swank, Smith, & Landry, 2006) and math (Casey, Dearing, Dulaney, Heyman, & Springer, 2014) skills. Scaffolding has also been linked to the development of executive functioning skills (Bernier, Carlson, & Whipple, 2010; Neitzel & Stright, 2003), which support learning across a variety of domains (Cortés Pascual, Muñoz, & Robres, 2019).

### ***Intrusive help***

However, parents and teachers do not always provide contingent help. Sometimes, they might overhelp - that is, provide *more* help than the child needs. Returning to the earlier example of a parent helping their child with homework, imagine that this parent stepped in and simply did the assignment for the child, even when there were no clear

signs that their child was struggling. In this case, the child may have needed some help to get started, but having the assignment done for them might feel intrusive.

The above example illustrates “intrusive” help – that is, help that is characterized by greater involvement than is warranted by the developmental stage or needs of the child (Padilla-Walker & Nelson, 2012). Of course, it is important to note that not all help that appears intrusive to an observer might be *experienced* as such by a child or other help recipient; indeed, in some situations, children might welcome an adult doing a task for them even if they could do it themselves. However, even help that might not be *experienced* as intrusive by those involved can still be *considered* intrusive in the sense that it hinders both the child’s independence and learning. For instance, a child might be relieved when their parent steps in and does homework for them, but this type of help can still potentially rob them of their ability to learn how to tackle similar problems on their own. Here, we define intrusive help as any help that impedes the learning process and undermines the help recipient’s agency or independence. (I return to the idea of intrusive help being “in the eye of the beholder” in the General Discussion.)

While any adult might sometimes provide a child with more help than is needed, an intrusive approach to help has received considerable attention in the context of parenting specifically. This is not entirely surprising: parents’ beliefs and practices are key drivers of children’s motivation and achievement (Eccles & Harold, 1993) and, unlike teachers who primarily help children in a single context (the classroom), parents help their children in a variety of contexts and domains over time. And while parents vary in their approaches, a wealth of literature has emerged over the last few decades on “overparenting” (Segrin, Wosidlo, Givertz, Bauer, & Murphy, 2012), “intensive”

parenting (Ishizuka, 2019), “helicopter” parenting (Moilanen & Lynn Manuel, 2019; Padilla-Walker & Nelson, 2012), or “snowplow” parenting (Miller & Bromwich, 2019).

Intrusive help is a hallmark of these parenting styles. For instance, at younger ages, parents who take a more intrusive approach might take over and do tasks like puzzles on behalf of their children when the child starts to struggle instead of letting them try to see if they can solve it independently (Leonard, Martinez, Dashineau, Park, & Mackey, 2021). Parents may also provide intrusive help for older children, even to the extent of intervening to solve problems their young adult child has with professors or employers (Padilla-Walker & Nelson, 2012), for example, instead of providing advice and encouraging them to actually solve the problems on their own.

Intrusive help from parents has largely been associated with negative consequences for both younger and older children. Even preschoolers, whom one might expect to need more help in general, show lowered motivation and persistence when their parent “takes over” and does parts of a puzzle on their behalf (Leonard et al., 2021). Among adolescents and young adults, intrusive help has been linked to negative academic outcomes, including lower academic motivation (Schiffrin & Liss, 2017), lower school engagement (Padilla-Walker & Nelson, 2012), and greater school burnout (mediated by self-control; Love et al., 2020). Intrusive parenting is also associated with lower well-being in this age group (Shiffrin et al., 2014), including lower self-regulation, lower feelings of personal mastery (i.e., feeling “in control” of one’s own life), greater depressive symptoms (Moilanen & Lynn Manuel, 2019), and, interestingly, greater academic (Fletcher, Pierson, Speirs Neumeister, & Finch, 2020) and interpersonal (Segrin et al., 2012) entitlement.

These negative outcomes might prompt the question of *why* any adult, including a parent, would engage in intrusive help. But before we can answer this question, we need to understand how adults might be construing this help in the first place. That is, what messages do adults think intrusive help might convey about helpers and help recipients? I turn to this topic in the next section.

### **What intrusive help might convey**

Despite the fact that intrusive help is associated with an array of negative consequences, some parents still choose to engage in it. One possible reason why this might be the case is that parents who opt to provide intrusive help construe it differently than parents who do not. Unfortunately, little is known about how parents (and adults in general) think about intrusive help and what it might convey. We also know little about how learners themselves might construe intrusive help specifically. However, past research suggests that help more generally, as well as other inputs such as praise and feedback, can send messages about to learners about their abilities – for instance, about whether they are competent at a given task, or whether their abilities are fixed or can change with effort (e.g., Muenks, Yan, Woodward, & Frey, 2021). Here, I explore this prior work and consider its implications for how adult observers might interpret instances of intrusive help.

In this section (and in the present research addressing how adults might construe intrusive help), I focus specifically on how adults think about intrusive help given by teachers. I do so for a few reasons. First, much of what is known about the messages that help (and achievement-related practices more generally) might send to learners (or third-party observers) comes from studies that involve teachers and students. Thus, as a first

step towards understanding how adults construe intrusive help, it might be especially fruitful to examine what messages they think a teacher's help might convey to their students. Second, like parents, teachers are influential in shaping children and adolescents' learning and motivation. Thus, it is also important to understand how adults construe their help as well. Finally, classroom environments are a particularly interesting case because students usually do not receive input like help in isolation; there is often clear evidence of how the teacher helped *other students*. Such situations provide an opportunity to examine how adults think about intrusive help and what it might communicate when it stands in contrast to other types of help.

***Intrusive help may shape perceptions of the help recipient's ability***

While there is little prior work examining what adults think about instances of help and what messages this help might convey, there is evidence from research with children suggesting that help can send messages about those who receive it. In one recent study, children as young as four viewed a group who was offered (an unspecified amount of) help from a teacher as being less competent than a group who was not offered such help (Sierksma & Shutts, 2020). Thus, even among young children, whether or not someone is offered help might provide some cue towards their competence. While prior explorations into help as a cue to others' competence have not specifically examined inferences about those who receive excessive or intrusive help, these prior findings suggest that, all else being equal, we might expect adult observers to perceive those who receive more help than someone else as less competent.

It is important to point out that, when using a helper's actions to infer a help recipient's competence, observers' perceptions may not line up with the *true* competence

of the help recipient. Indeed, the helper may not have an accurate sense of the recipient's competence (and thus might miscalibrate their help), or the helper might hold other beliefs that drive them to provide more or less help than would be necessary. Still, in cases where an adult is providing help to a child (e.g., a teacher providing help to their student), observers might be especially likely to assume that the help they are seeing is diagnostic of the child's ability, since adults likely have more experience with the task at hand (and thus may be seen as a trustworthy judge of the child's competence). In a case where a teacher provides intrusive help to a student, we might generally expect adults to infer that that student is not very competent.

Of course, adults' observers' perceptions of a child's ability might not only be shaped by the amount of help they see that specific child receive, but also by the amount of help they see *others* receive on the same task. In classroom contexts, students almost never receive help in isolation; teachers often provide multiple students with varying amounts of help. Observing such contrasts might provide an important cue towards those students' relative abilities. We know from the praise literature, for instance, that when two students achieve the same outcome on a task but one is praised and the other is not, both adolescents and adults perceive the student who was praised as less competent (Meyer, 1992; Meyer et al., 1979; Meyer, Mittag, & Engler, 1986). Contrasts in help, too, may convey meaningful information about help recipients' abilities; for instance, if one student has a task done for them by a teacher but another student is merely given a hint, adult observers might infer that the former has lower competence than the latter.

***Intrusive help may shape perceptions of the helper's beliefs***

In addition to conveying messages about the help recipient, instances of intrusive help might also convey messages about the *helper*. That is, when a teacher provides intrusive help, their actions might communicate something about what they believe. There is considerable evidence from the achievement motivation literature suggesting that teachers' practices can signal their beliefs, including their mindsets about whether students' abilities are fixed or malleable (Griffiths, Murdock-Perriera, & Eberhardt, 2023; Kroeper, Fried, & Murphy, 2022; Muenks et al., 2021). For example, a teacher responding to students' struggles with support and suggestions for new strategies, rather than with frustration, can signal that that teacher has more of a growth mindset (Kroeper et al., 2022). Teachers' pedagogy can also act as a cue towards what is valued in their classroom (e.g., performance vs. learning; Patrick & Ryan, 2008).

Such messages about what teachers believe and value play an important role in shaping students' motivation. Students who perceive their instructor as having more of a fixed mindset about students' abilities, relative to those who perceive their instructor to have more of a growth mindset, tend to experience more negative outcomes, including more concern with being evaluated, less belonging, lower engagement, and even lower grades (for a review, see Dweck & Yeager, 2019; Muenks et al., 2020; Walton & Yeager, 2020). Classes with fixed mindset instructors also tend to show larger achievement gaps along lines of gender and race (Canning, Muenks, Green, & Murphy, 2019; Canning, Ozier, Williams, AlRasheed, & Murphy, 2021; Rattan et al., 2018).

While prior work has found that teachers' practices can influence the messages that students take away about their abilities, we know surprisingly little about what messages teachers' *help* specifically might send, either to students or to third-party

observers. Given that intrusive or excessive help is often demotivating for students themselves, we might expect even adult observers to think that this type of help conveys a negative message – for example, that the teacher believes that some students cannot improve their abilities.

### **Why might adults opt to provide intrusive help?**

Given that intrusive help is linked to negative motivational consequences (and that it could convey negative messages about students' abilities), one might wonder: why do teachers or parents choose to engage in it in the first place? It may seem especially puzzling in cases where adults intervene to solve problems for a child that has already reached adolescence or young adulthood; after all, these periods of development are often marked by increasing autonomy and independence (Padilla-Walker & Nelson, 2012). However, there is increasing evidence to suggest that such practices are not uncommon, particularly among parents. Many high school and college administrators are reporting what appears to be a rise in parental interference in adolescents' and young adults' affairs, as reported in recent popular press articles (Miller & Bromwich, 2019; Quealy & Miller, 2019) and books (Lythcott-Haims, 2015).

Data from parents themselves also highlight the 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 their child’s performance or grades at college” (Quealy & Miller, 2019). And while a parent’s ability to engage in certain forms of intrusive parenting might be dependent on their level of education, access to resources, etc., recent

sociological work suggests that support for this approach to parenting is similar among parents of different social classes (Ishizuka, 2019). Thus, an intrusive approach towards helping one's children, even when they should be able to solve many problems with less help, may be becoming somewhat common – or, at the very least, more culturally normative (Ishizuka, 2019).

Why might intrusive parenting be on the rise, even for adolescent or young-adult children who should be relatively independent? Earlier work has largely focused on broader structural factors, such as access to resources or shifts in economic conditions. Indeed, factors such as social class are likely to predict parents' ability to engage in resource- and time-intensive parenting practices in the first place (Ishizuka, 2019). But as noted above, support for such practices is increasing across demographic groups within the United States (Ishizuka, 2019). Economists have proposed that these evolving norms could be attributed to changing economic conditions that increasingly favor attaining a college degree (Pew Research Center, 2014; Quealy & Miller, 2019). In this context, parents may perceive more competition for prestigious jobs, etc., and thus be more likely to intervene to ensure their child's success (Dopeke & Zilibotti, 2019).

While this existing work points out factors that likely play an important role in shaping parents' practices, it does not provide a complete picture of why parents sometimes opt for an intrusive approach. Indeed, factors like resource constraints or economic pressures might influence broader patterns and trends in parenting, but they do not entirely explain why individual parents might choose to intervene more than necessary. To shed light on this question, we must examine more proximate influences, such as the beliefs parents hold.

Surprisingly, no prior research has investigated which beliefs might drive parents to specifically engage in intrusive parenting practices, despite decades of literature demonstrating the importance of parents' beliefs in influencing the achievement- or schooling-related practices they use with their children (for a review, see Eccles & Harold, 1993; Haimovitz & Dweck, 2016, 2017). Such investigations are critical, however, for understanding how best to intervene and encourage parents to employ more contingent, autonomy-supportive practices with their children. Without knowing which specific beliefs drive parents to engage in intrusive practices, attempts to promote a more adaptive approach may fall flat.

The present work aims to address this question by examining whether those who endorse intrusive helping practices tend to be those who believe that parents *need* to intervene to solve problems and make decisions for their children, even by the time they are young adults (and should be relatively independent). This belief touches on a central theme in recent debates about whether or not an intrusive 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 the need to solve problems and make decisions for even young adult children. That is, some parents might judge more intrusive practices to be more appropriate because they believe that parents *need* to engage in these practices in order for their children to be successful. In contrast, parents who do not share this belief might

be less likely to deem intrusive practices appropriate and instead opt for practices that are more autonomy supportive.

One interesting question is whether parents with these different beliefs might not only disagree about whether intrusive help is appropriate, but also about what messages such help might send about ability. As noted in the previous section, there are reasons why we might expect intrusive help to convey negative messages about a help recipient's ability (and/or about whether their abilities can change). However, it is possible that some parents - particularly those who tend to endorse intrusive practices - might not think that these practices actually send such maladaptive messages. Alternatively, these parents may in fact recognize that intrusive help could convey negative messages but still endorse them because they believe that they are necessary for their child's success. Exploring these alternatives is critical for understanding how we might intervene to prevent parents from engaging in intrusive help; if parents already seem to be aware that intrusive help can convey negative messages (but still endorse intrusive practices anyway), then simply educating parents about these messages would likely be an ineffective intervention strategy. But if some parents are not aware of the extent to which intrusive help can convey negative messages about ability, then promoting this awareness might be a fruitful step to study further.

### **Current Research**

I begin in Chapter 1 by exploring the beliefs that might drive parents to endorse intrusive parenting practices (including intrusive help). Study 1 examines whether the general belief that parents *need* to solve problems and make decisions for even young-adult children across a variety of domains predicts parents' endorsement of intrusive

practices with a younger age group (i.e., adolescent children) in a hypothetical achievement context. Study 2 compares data from parents who participated in Study 1 (which was conducted in 2020 at the beginning of the COVID pandemic) to data from a new sample of parents run (using an identical design) in 2023. This comparison sheds light on how the period of virtual schooling may have impacted parents' endorsement of intrusive practices. Whereas the previous studies examined parents' *agreement* with different practices (i.e., how appropriate parents thought these practices would be for another hypothetical parent to engage in), Study 3 turns to parents' *own choices* of practices. Specifically, I explore whether parents' beliefs about the need to solve problems for even young-adult children predict the practices they themselves would use with their own adolescent child. Finally, Study 4 probes whether the relationship between parents' beliefs and their endorsement of intrusive practices is moderated by the child's past performance in school.

Chapter 2 aims to shed light on how adults construe intrusive help, with a specific focus on what messages adults think intrusive help sends about the helper as well as the help recipient. As mentioned above, I focus on how adult observers interpret teachers' help in these studies. Study 1 compares how three forms of help from a teacher (being offered no help, receiving a hint, or having a task done on one's behalf) influence adults' perceptions of a student's competence as well as their perceptions of the teacher's mindset about students' abilities. This study also compares how viewing three different students receive these contrasting amounts of help might influence such perceptions above and beyond viewing one of them in isolation. Study 2 delves deeper into the role of contrast, exploring whether a more subtle contrast in help still conveys that a teacher has

more of a fixed mindset about students' abilities. Finally, Study 3 investigates how different types of framing might buffer against the inference that a teacher who engages in (what may seem like) intrusive forms of help has a fixed mindset.

Chapter 3 explores how intrusive help from parents is interpreted. Specifically, we examine how the beliefs we explored in Chapter 1 - i.e., the belief that parents need to solve problems and make decisions even for young-adult children - relate to parents' interpretations of intrusive help. In Study 8, I investigate whether parents who hold this belief are less likely to think that intrusive help (coming from a parent) conveys negative messages about children's abilities.

## Chapter 2: Why might parents “intrude”?

Why might some parents “intrude” on their child’s academics, even going so far as to do schoolwork for an adolescent? Here, we examine a possible driver of this type of parenting behavior: namely, believing that parents need to make decisions for and solve problems on behalf of their children within a number of domains (e.g., their school/work life, social life, and extracurricular activities), even once it is (arguably) no longer necessary. We specifically explore whether these beliefs predict parents’ agreement with using highly intrusive practices with adolescents (~ages 14-18) in the achievement domain.

To assess parents’ beliefs, we developed and employed a new scale (adapted from items created by Padilla-Walker & Nelson, 2012). Our goal with this new scale was to measure the extent to which parents believe it is necessary to make decisions and solve problems for young-adult children (~ages 18-22 years). At first glance, it may seem surprising that we opted to assess parents’ beliefs regarding young-adult children rather than adolescent children. However, we chose to do so deliberately. As noted in the Introduction, young adulthood is a developmental period when (typically developing) children are usually afforded more independence and are capable of managing most aspects of their lives themselves. Indeed, most of the time, young adults are able to make decisions and solve problems on their own; parental attempts to step in and take these actions themselves are often unnecessary and could even be considered intrusive (Padilla-Walker & Nelson, 2012). We reasoned that if a parent believes it is *necessary* for parents to make decisions and solve problems for even young-adult children, then they would be

more likely to endorse intrusive parenting practices with younger children – in this case, adolescents.

In Study 1, using this new belief scale, we investigated whether these beliefs predicted parents' agreement with using highly intrusive practices vs. less intrusive practices (i.e., more autonomy-supportive practices) with adolescents in the achievement domain. In Study 2, we aimed to replicate our key findings from Study 1 (three years after the original study) while also examining how parents' beliefs shaped their involvement with their adolescents' schooling during the COVID-19 pandemic. In Study 3, we moved from asking parents about whether they think would be appropriate for another parent to engage in highly or less intrusive practices (as we did in Studies 1 and 2) to asking parents what *they themselves* would do. Finally, in Study 4, we examined the role of an adolescent's past academic performance in moderating the relationship between parents' beliefs and their agreement with more or less intrusive practices.

### Study 1

Study 1 (pre-registered: <https://osf.io/xtchm/>) investigated whether beliefs about the extent to which parents need to make decisions for and solve problems for young-adult children predict parents' agreement with highly (vs.) less intrusive parenting practices.

We hypothesized that such beliefs would indeed predict parents' agreement with highly intrusive practices (e.g., doing a school project for their adolescent child), but would not predict their agreement with less intrusive practices (e.g., allowing their adolescent child to do the project on their own). This prediction was based on findings from our previous pilot work using the same study design. In our pilot studies, we had

expected to find that the more a parent believed they needed to make decisions and solve problems for even young-adult children, the more they would agree with highly intrusive practices and the less they would agree with less intrusive practices. Our pilot results revealed the former but, surprisingly, not the latter. We think that this was likely due to the fact that we intentionally did not design the less intrusive practices in our studies to be as extreme as many of our highly intrusive practices (both are described in more detail below; see “Methods”). While many of our highly intrusive practices involved more extreme actions (e.g., ‘taking over’ and doing work on behalf of the child), our less intrusive items were intended to embody a more autonomy-supportive approach (e.g., encouraging the child to work independently, but being available for help if needed). Considering these practices on a continuum of parental involvement, the less intrusive practices we presented to parents are quite far from the extremely low (i.e., neglectful) end of the spectrum, whereas the highly intrusive practices we used are relatively closer to the extremely high end of the spectrum. Since parents in Study 1 were asked to judge the same practices we used in prior pilot work, we predicted we would find similar results.

## **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.

The final sample of parents ( $N = 99$ ) was 56% female and 70% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***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 achievement - e.g., 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 for their time. All of the experimental procedures described here (and in the studies that follow) 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 most included either no information about the adolescent's past performance, or information that the adolescent's past performance relevant to the specific situation was mixed (i.e., sometimes they succeeded, and other times they struggled). (We directly manipulate the adolescent's past performance in Study 4.) We chose to describe the adolescent's past performance mixed or ambiguous in most of the scenarios 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 highly intrusive or less intrusive

practices 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 the table below.

**Table 1.** Exact text for each of the four scenarios shown to parents in Study 1.

| Scenario 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.                                                                                                                                                                                                                             |

### ***Highly and Less Intrusive Practices.***

Following each scenario, parents were presented with either two or four items, each of which described a potential response the adolescent's parent might have to the given scenario. Critically, these items varied in terms of whether they involved a highly intrusive practice or less intrusive practice. Less intrusive practices were ones in which the parent granted autonomy to their adolescent child and provided just enough support so that the adolescent could proceed independently. Highly intrusive practices, in contrast, involved providing considerably more support than was necessary (or taking over entirely and doing something on behalf of the adolescent).

Half of the items following each scenario involved a less intrusive response, and the other half involved a highly intrusive response. Parents were instructed to rate each of these items in terms of “how much they agree[d] or disagree[d] that [it] was the *appropriate* response to for the given scenario” they just read. Across the four scenarios, parents rated a total of 10 items (5 highly intrusive items and 5 less intrusive items; see Table 2 below).

**Table 2.** Exact text for the highly and less intrusive practices.

| Scenario         | Intrusiveness    | Item                                                                                                                                                                                                                           |
|------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test preparation | Highly intrusive | "The parent reviews the test material and comes up with practice questions to review repeatedly with their high-schooler until the parent has 100% confidence that the high-schooler will get an excellent grade on the test." |
|                  |                  | "The parent requires that their high-schooler study for a certain amount of time and checks frequently to make sure that they are doing enough studying."                                                                      |
|                  | Less intrusive   | "The parent encourages their high-schooler to study independently and provides help only when they ask for it."                                                                                                                |
|                  |                  | "The parent makes sure that there is a quiet, distraction-free place to study, but leaves the studying itself up to their high-schooler."                                                                                      |
| Science project  | Highly intrusive | "The parent does most of the project for their high-schooler to make sure it is high-quality."                                                                                                                                 |
|                  |                  | "The parent sits down and works on the project (with some help from their high-schooler) until the parent is confident that their high-schooler will get an excellent grade."                                                  |
|                  | Less intrusive   | "The parent encourages their high-schooler to work on the project independently and provides help only when they ask for it."                                                                                                  |
|                  |                  | "The parent makes sure that there is a quiet, distraction-free place for working on the project, but leaves completing the project up to their high-schooler."                                                                 |
| Piano            | Highly intrusive | "The parent tells their high-schooler that they cannot quit."                                                                                                                                                                  |
|                  |                  | "The parent lets their high-schooler take a short break, but has them keep practicing piano at home in the meantime so that they don't fall behind."                                                                           |
|                  | Less intrusive   | "The parent encourages their high-schooler to continue, but ultimately lets their high-schooler decide if they want to quit playing."                                                                                          |
|                  |                  | "The parent encourages their high-schooler to take a break and re-evaluate later whether or not they would like to quit."                                                                                                      |
| Math teacher     | Highly intrusive | "The parent contacts school administrators to insist that their high-schooler be reassigned to a different teacher."                                                                                                           |
|                  | Less intrusive   | "The parent accepts their high-schooler's assignment to that teacher."                                                                                                                                                         |

### ***Parent Belief Scale.***

We constructed a novel scale to measure beliefs about whether parents in general *need* to make decisions and solve 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) in which parents reported the extent to which they *involved themselves* in solving problems and making decisions for their *own* young-adult child. On Padilla-Walker and Nelson's (2012) scale, parents indicated the extent to which certain behaviors were "like them"; for instance, they responded to items such as "I intervene in solving problems my child has with their employers or professors" or "I make important decisions for my child (e.g., where they live, where they work, what classes they take)." The scale showed high levels of internal consistency for both mothers and fathers (all Cronbach's alpha values > .76). Moreover, Padilla-Walker and Nelson (2012) also surveyed these parents' young-adult children and found that young adults' perceptions of how intrusive their parents were matched up with parents' own reports of how much these intrusive behaviors were "like them." These findings, coupled with the fact that this scale has been successfully used in a number of studies to measure intrusive parenting (e.g., Moilanen & Lynn Manuel, 2019), provide considerable evidence that Padilla-Walker and Nelson's (2012) scale meaningfully captures behaviors that characterize intrusive parenting.

Since we were interested in assessing beliefs about the extent to which parents *need* to solve problems and make decisions for young-adult children, we decided to adapt Padilla-Walker and Nelson's (2012) scale. We did so in three key ways. First, instead of asking parents to report their own behaviors (i.e., how often they themselves 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 – that is, how much they think parents *in general* need to solve problems and make decisions for their young-adult children - rather than about beliefs or behavior specific to their own child. These first two 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., a parent needs to intervene in solving problems with their young-adult child’s employers or professors) and one asserting that a young adult needs to solve this problem on their own (e.g., a young adult needs to solve problems with their employers or professors). 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 intrusiveness (i.e., deciding what outside or elective activities one’s young-adult child should participate in) that had not been included in Padilla-Walker and Nelson’s (2012) scale. Together, these adaptations allowed us to measure parents’ general beliefs about whether parents need to make decisions or solve 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):

1. 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).
2. 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.
3. A young adult [parent] needs to [intervene to] settle disputes they have [that their young-adult child has] with roommates or friends.
4. A young adult [parent] needs to solve problems with their [to intervene in solving problems with their young-adult child's] employers or professors.
5. A young adult [parent] needs to solve any crisis or problem that they might have [that their young-adult child has].
6. A young adult [parent] needs to look for jobs [for their young-adult child] or try to find other opportunities [for them].

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 make decisions and solve problems for their young-adult children.

It should be noted that, unlike the scenarios used in our study (see Table 1), our parent belief scale did not pertain only to achievement; rather, it covered multiple domains of the young adult's life. By asking parents about the extent to which they generally think that parents need to solve problems and make decisions for even young-

adult children, we hoped to tap into core beliefs about parental help and involvement that we thought might relate to parents' agreement with specific achievement-related practices with a younger age group (i.e., adolescents).

### *Analysis Strategy.*

Our key hypothesis was that beliefs about whether parents need to make decisions and solve problems for young-adult children would predict parents' agreement with highly (vs. less) intrusive practices. Specifically, we hypothesized that the more one believed that parents *need* to make decisions and solve problems for young-adult children, the more they would agree that it would be appropriate for another (hypothetical) parent to engage in highly intrusive practices with their adolescent. We did not expect to find a significant relationship between these beliefs and parents' agreement with less intrusive practices (see Study 1 intro for more details about why we made this prediction).

To evaluate our predictions, we used both frequentist and Bayesian approaches, per our pre-registered analysis plan. However, since our findings were consistent across these two approaches, we discuss only the frequentist analyses here. (See the appendices for details about the Bayesian analyses and associated results.)

We expected that, in models predicting parents' agreement with highly vs. less intrusive practices, there would be an interaction between parents' belief scores (where higher scores indicate believing to a greater extent that parents need to make decisions for and solve problems for young-adult children) and the intrusiveness (high vs. low) of the practice being considered. We also expected that, in follow-up analyses, parents' beliefs

would predict higher agreement with highly intrusive practices but would not predict agreement with less intrusive practices.

In our frequentist approach, we tested these predictions using linear mixed effects models. The following variables were entered as fixed effects: parents' belief score (entered as a continuous variable), the intrusiveness of the practice being considered (either highly or less intrusive; entered as a categorical variable), the interaction between the two (i.e., the interaction between belief score and whether the practice being considered was highly or less intrusive), 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 did not pertain to how parents' agreement with parental practices differed 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 our models was parents' agreement with the highly or less intrusive practices as being the appropriate response for another parent to have in the given scenario. Parents' agreement ratings were entered as a continuous variable in our linear mixed effects models.

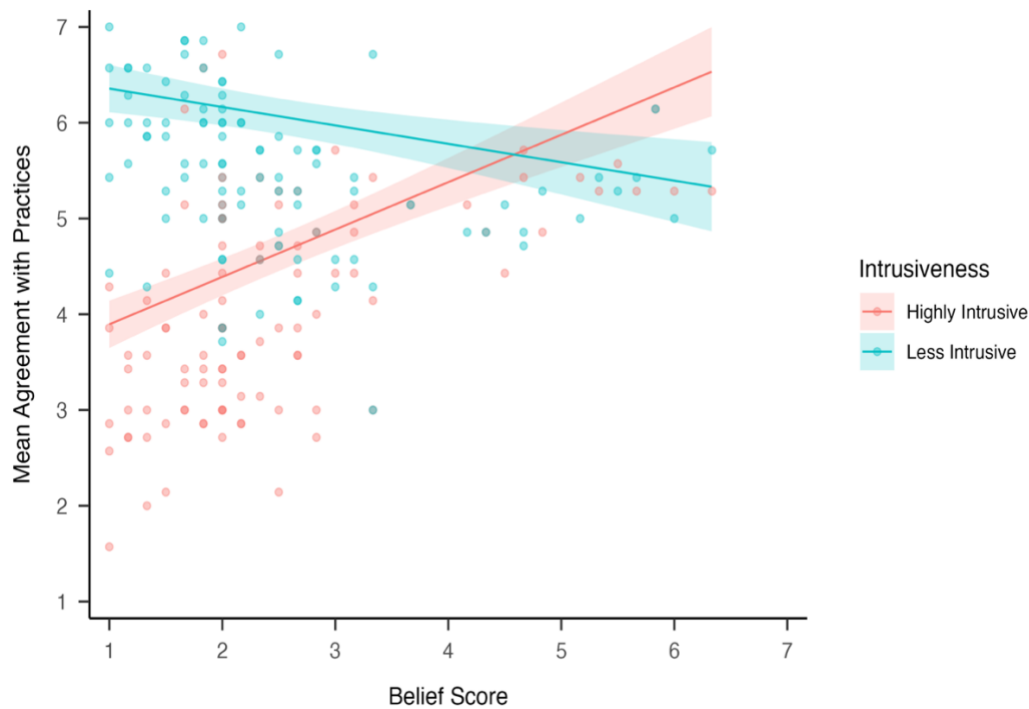
Per our pre-registered inference criteria, used the standard  $p < .05$  criterion in all of our frequentist analyses for determining significance of individual predictors.

## Results

As noted in the Analysis Strategy section above, we first evaluated whether there was an interaction between parents' scores on our belief scale and the intrusiveness of the practices they were considering (highly vs. less intrusive). A linear mixed effects model revealed that, consistent with our initial predictions, there was indeed an interaction: the relationship between parents' beliefs and their agreement with different practices varied as a function of whether they were considering highly or less intrusive practices,  $B = -0.69$ , 95% CIs  $[-0.82, -0.56]$ ,  $SE = 0.07$ ,  $p < .001$ ,  $R^2_{\text{marginal}} = 0.27$ .

We followed up on this interaction by running two additional models: one examining parents' ratings of highly intrusive practices, and the other examining parents' ratings of less intrusive practices. As hypothesized, parents with higher belief scores agreed more strongly with highly intrusive practices,  $B = 0.49$ , 95% CIs  $[0.35, 0.64]$ ,  $SE = 0.06$ ,  $p < .001$ ,  $R^2_{\text{marginal}} = 0.29$ . However, parents with higher belief scores also agreed less with less intrusive practices,  $B = -0.19$ , 95% CIs  $[-0.32, -0.07]$ ,  $SE = 0.06$ ,  $p = .003$ ,  $R^2_{\text{marginal}} = 0.03$ .

While the latter finding is not consistent with our initial pilot findings and pre-registered hypotheses, it is worth noting that, prior to piloting, we had initially predicted that parents with higher belief scores would agree less with less intrusive practices. Here, we found that this was in fact the case, although the effect of belief score was weaker for parents' ratings of less intrusive practices relative to their ratings of highly intrusive practices (see Figure 1 below).



*Figure 1.* Parents' ratings of highly and less intrusive practices in Study 1, plotted as a function of belief score. Points represent individual data, and shaded regions represent 95% bootstrap CIs.

## Discussion

In sum, these findings suggest that our pre-registered hypotheses were largely supported. Among parents of adolescents, higher belief scores (indicating a stronger belief that parents need to make decisions and solve problems for their young-adult children across many domains) predicted stronger agreement with highly intrusive practices as being appropriate for another parent to use in achievement-related scenarios with their adolescent. The predicted interaction also emerged, such that the relationship between parents' belief scores and their agreement with highly intrusive practices was

stronger (i.e., significantly more positive) than the relationship between belief scores and agreement with less intrusive practices.

We also found that higher belief scores predicted lower agreement with less intrusive practices. This is consistent with the initial predictions we had prior to piloting, but not with the results we found in our pilot studies. While the relationship between parents' belief scores and their agreement with less intrusive practices was directionally negative in our pilot work, it was not significant. It is possible that we found a significant relationship between these variables in the present 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). Indeed, after combining the data from two earlier pilots and running an analysis on the resulting sample of  $N = 100$ , a significant (but still weak) effect emerged, suggesting that low sample size may have obscured this effect in the individual pilot samples. Thus, it may be the case that the beliefs we are measuring are a negative, but weak, predictor of parents' agreement with less intrusive achievement-related practices.

In sum, parents' beliefs about the need to make decisions and solve problems for young-adult children were predictive of their agreement with different practices. The more strongly parents held these beliefs, the more they agreed with using highly intrusive practices with adolescents, and the less they agreed with using less intrusive practices. In Study 2, we explore whether these findings would replicate in a new sample of parents.

## Study 2

In Study 2, we aimed to examine whether our key findings from Study 1 would replicate in a new sample of parents three years later (in 2023). Study 1 was run during the very beginning of the COVID-19 pandemic, just as significant changes were arising in almost everyone's schooling experiences. During the course of the pandemic, most students had to attend classes online rather than in-person. But these changes did not just affect students; indeed, many parents suddenly had increased access to aspects of their child's education: how they were being taught, what materials the teacher was using in their teaching, etc.

By 2023, many of these changes were no longer in effect, and schooling had largely returned to its pre-pandemic format. We wondered whether, three years later (and after experiencing a series of unprecedented changes to schooling), parents would report similar beliefs and judgments about intrusive parenting practices. We originally planned to recruit and survey the same parents who ran in Study 1; however, due to issues with MTurk (the data collection platform we used for Study 1), we were unable to contact those parents. Thus, we recruited a new sample of parents to participate and presented them with a survey that was almost identical to what participants saw in Study 1. We did not have any specific predictions about whether these new parents' beliefs and judgments would look similar or different; however, we planned to 1) examine whether our key findings from Study 1 were replicated in this new, more recent sample, and 2) directly compare our findings in the present study with those from Study 1 in order to see whether parents' beliefs and judgments had changed in the aggregate (and if so, in which direction).

## Methods

### *Participants.*

Participants were 159 parents recruited from MTurk via the CloudResearch platform. We used the same inclusion and exclusion criteria as in Study 1. Due to the aforementioned issues with MTurk, we were unable to automatically exclude parents who had previously participated in any of our prior studies on parenting. Thus, we recruited our sample as usual and manually excluded data from anyone who had participated in these previous studies. A total of 30 parents were excluded from analyses due prior participation. This resulted in a total sample of  $N = 114$ . All parents provided their consent electronically prior to their participation.

The final sample of parents ( $N = 114$ ) was 50% female and 73% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### *Procedure.*

The procedure for this study was almost identical to that of Study 1. Parents were directed to a Qualtrics survey, where they were presented with the same items shown to parents in Study 1: the four hypothetical scenarios and accompanying items (i.e., the highly or less intrusive practices), the parent belief scale, and an attention check. As in our prior studies, the order in which parents saw the scenarios and their respective items was randomized.

After responding to the same materials from Study 1, parents were then asked two exploratory questions about their involvement with their child's academics during the COVID-19 pandemic (described below). Parents were also asked a few other exploratory

open-ended questions; however, since these questions were not related to our primary goals for this study, we did not analyze parents' responses to them and will not discuss them further.

Following these exploratory questions, parents filled out basic demographic questions and were then fully debriefed and compensated for their time.

### ***Pandemic Involvement.***

Parents' self-reported involvement in their child's schooling/academics during the COVID-19 pandemic were assessed using two items, both exploratory in nature. Parents were first asked, "Did you become *more involved* than you already were in your child(ren)'s schooling/academics during the COVID-19 pandemic?" Response options for this question included "I did not become more involved than I already was" as well as four statements with increasing levels of involvement ("I became [a little, moderately, a lot, a great deal]" more involved").

Following this first item, parents who selected any of the four options indicating they had increased their involvement during the pandemic were then shown an open-ended question: "You indicated that you became more involved in your child(ren)'s schooling/academics during the COVID-19 pandemic. Have you maintained that level of involvement? Please explain." Parents' responses were coded in an exploratory fashion by the lead author using two coding schemes. The first coding scheme used a top-down approach to assess whether parents indeed maintained an increased level of involvement since the pandemic. Parents' reports of whether they maintained their increase in involvement were coded using four predetermined categories ("not maintained," "somewhat maintained," "maintained," or "unknown"). The second coding scheme

assessed parents' explanations for *why* they did or did not maintain a higher level of involvement. Using a bottom-up approach, parents' responses were first read carefully and emergent themes were identified. Two key themes that arose as reasons why parents did (or did not) stay more involved in their child's schooling/academics: 1) changing circumstances (e.g., return to in-person schooling) and 2) necessity (i.e., feeling that it was or was not necessary to continue being more involved). In line with these themes, parents' explanations were assigned one of three codes, which corresponded to the primary reason they cited for maintaining or changing their level of involvement after the return to in-person schooling ("because of changing circumstances," "because it was necessary," "because it was not necessary"). Note that each response was only assigned one code per coding scheme.

### *Analysis Strategy.*

Since the findings from frequentist and Bayesian analyses in Study 1 were identical, we only used a frequentist approach here in Study 2. Per our pre-registered analyses, we used linear mixed effects models to see whether our earlier findings were replicated in the present study. These models examined the relationships between parents' beliefs and their ratings of highly and less intrusive practices in our new sample of parents (recruited in 2023).

We also compared data from the 2023 sample to our 2020 sample (i.e., the parents who participated in Study 1). We did this primarily through visualization. Specifically, we visualized parents' belief scores as well as their ratings of highly and less intrusive practices in order to compare means and distributions across samples for these key variables.

Finally, we also examined parents' responses to our exploratory questions regarding their involvement with their child(ren)'s schooling/academics during the COVID-19 pandemic. We first examined parents' reported increase in involvement during the pandemic: using a linear model, we examined whether parents with higher belief scores increased their involvement during the pandemic to a greater degree than parents with lower belief scores. We then examined the extent to which parents who increased their involvement during the pandemic *maintained* this higher level of involvement after the return to in-person schooling. We first ran a chi-square to examine whether there were differences in the number of parents who reported maintaining a higher level of involvement following the return to in-person schooling. We then ran an ordinal regression to explore whether parents' belief scores predicted whether they maintained a higher level of involvement.

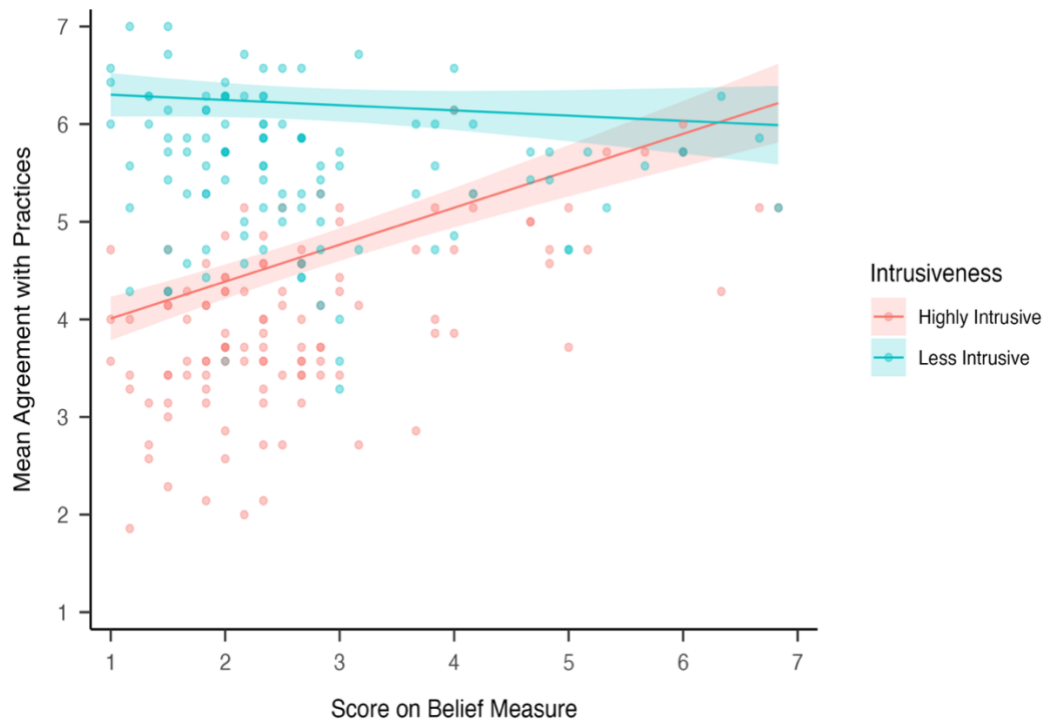
All of our data analyses for Study 2 were exploratory in nature. That is, we did not have any specific hypotheses about whether we would replicate our findings from 2020 (Study 1), nor did we make predictions about how the findings from 2023 might differ from those earlier findings.

## Results

### *Parents' evaluations of highly and less intrusive practices.*

We first examined the data from the 2023 sample on its own. We ran the same analyses used in Study 1 so that we could explore whether these earlier findings replicated in our newer sample. Overall, we found that our results from Study 1 indeed replicated three years later. There was a significant interaction between parents' belief scores and the intrusiveness level (high vs. low) of the practice they were considering, *B*

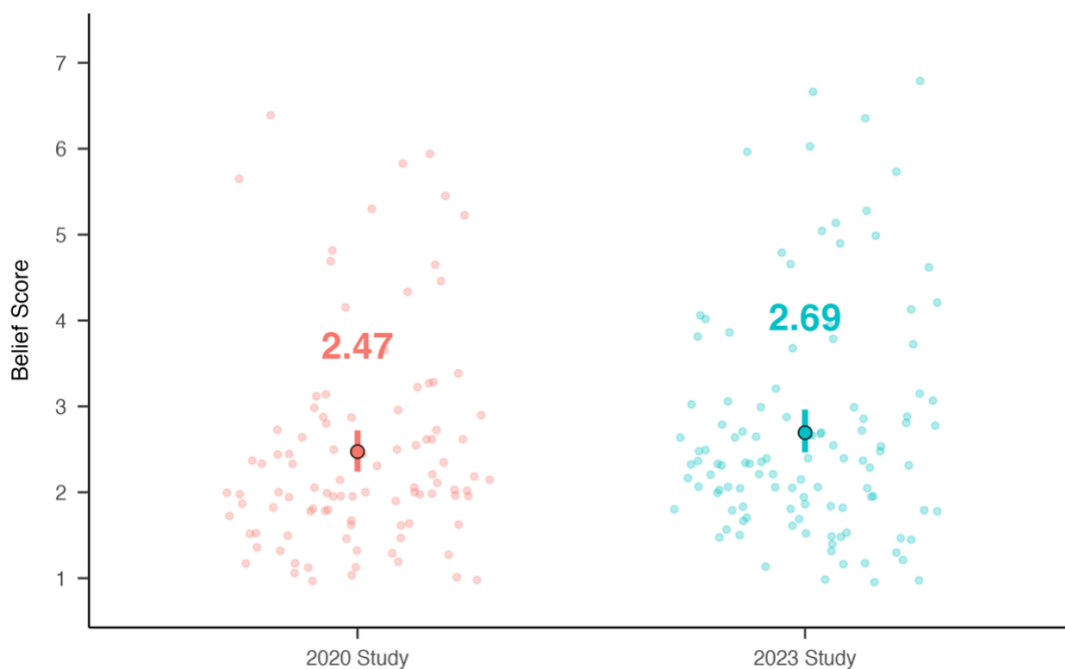
= -0.43, 95% CIs = [-0.55, -0.32], SE = 0.06,  $p < .001$ , marginal  $R^2 = 0.29$ . Follow-up analyses further revealed that parents' agreement with highly intrusive practices varied as a function of their belief score: those with higher belief scores reported stronger agreement with highly intrusive practices than those with lower belief scores,  $B = 0.38$ , 95% CIs = [0.28, 0.48], SE = 0.05,  $p < .001$ , marginal  $R^2 = 0.32$ . However, parents' agreement with less intrusive practices did *not* vary as a function of their belief score,  $B = -0.05$ , 95% CIs = [-0.16, 0.05], SE = 0.05,  $p = .323$ , marginal  $R^2 = 0.02$  (see Figure 2 below).



*Figure 2.* Parents' ratings of highly and less intrusive practices in 2023 sample, plotted as a function of belief score. Points represent individual data, and shaded regions represent 95% bootstrap CIs.

### *Comparing findings from 2020 and 2023.*

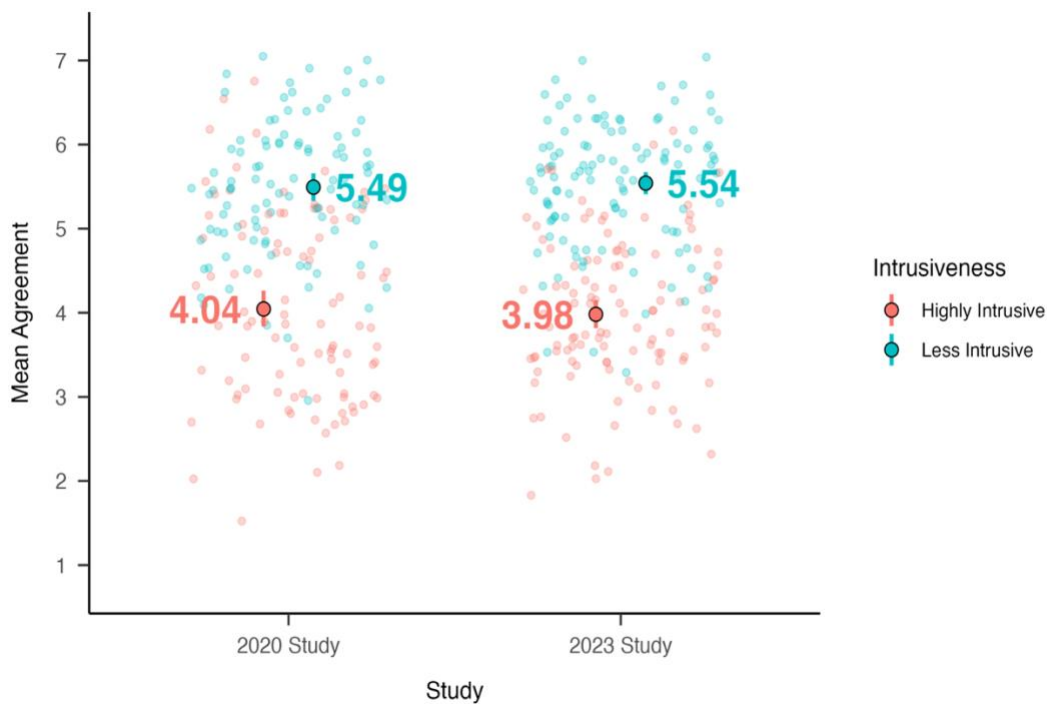
We then visualized data from both the 2020 sample and the 2023 sample so that we could qualitatively compare parents' belief scores and ratings of highly and less intrusive practices. As seen in Figure 3 below, the distributions of parents' belief scores across samples were strikingly similar. The means were also quite similar: parents had an average belief score of 2.47 (out of 7) in 2020 ( $N = 99$ ) and of 2.69 in 2023 ( $N = 114$ ). Thus, even three years after our original study, parents showed similar levels of agreement with the belief that parents need to make decisions and solve problems for young-adult children.



*Figure 3.* Belief scores across the original 2020 study and the 2023 follow-up study. The printed numbers represent the mean belief score for each study, and points represent individual data, and bars represent 95% bootstrap CIs.

Turning to parents' ratings of highly and less intrusive practices, further visualization (see Figure 4 below) revealed that parents showed similar levels of

agreement with these practices in 2020 and 2023. Parents' average agreement (on a 1-7 Likert scale, with higher scores indicating stronger agreement) with highly intrusive practices was 4.04 (N = 99) in 2020 and 3.98 (N = 114) in 2023, while their agreement with less intrusive practices was 5.49 in 2020 (N = 99) and of 5.54 in 2023 (N = 114). The distributions of individual data were also qualitatively quite similar across the two samples.

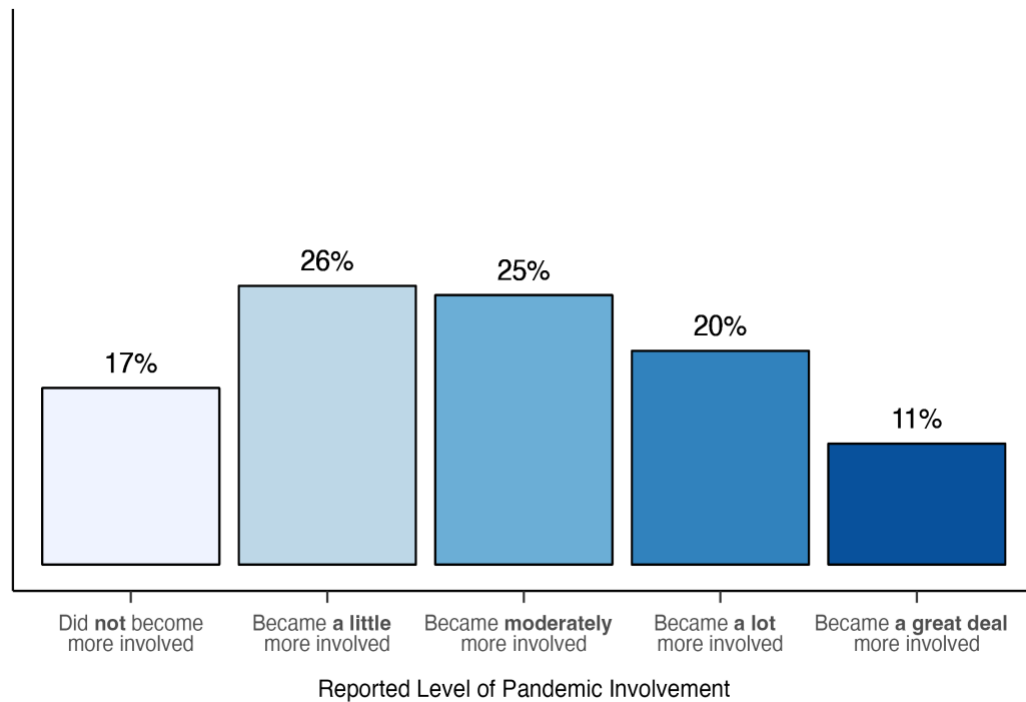


*Figure 4.* Agreement ratings for highly intrusive vs. less intrusive practices across the original 2020 study and the 2023 follow-up study. The printed numbers represent the mean belief score for each study, and points represent individual data. and bars represent 95% bootstrap CIs.

#### ***Parents' involvement during the COVID-19 pandemic.***

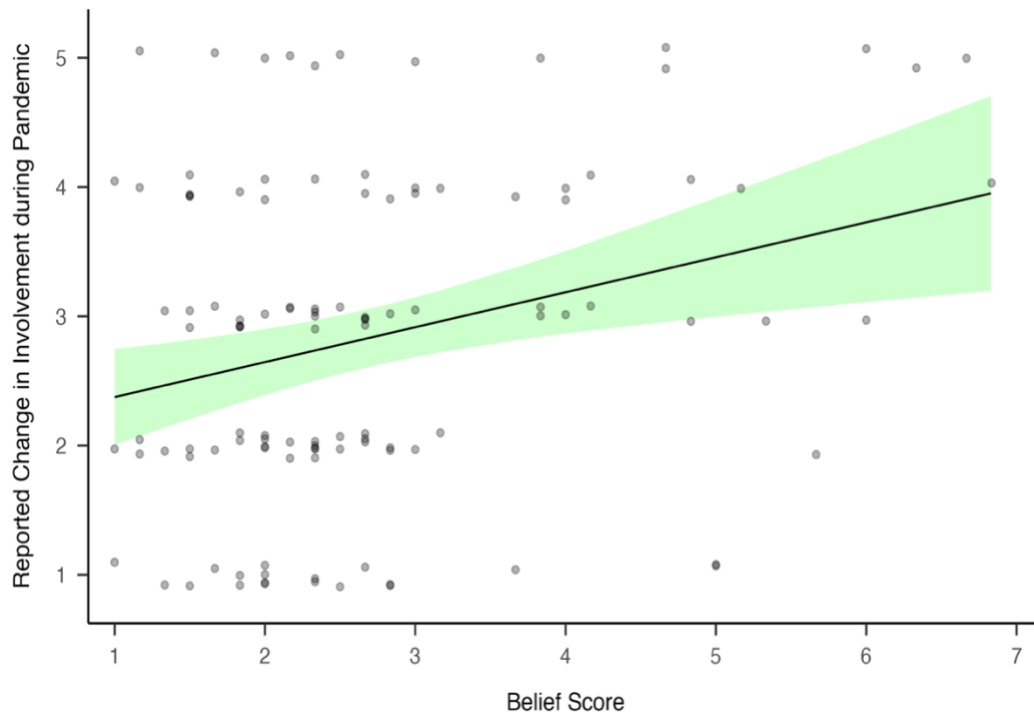
In addition to investigating whether our key findings from Study 1 would replicate three years later, one of the goals of Study 2 was to examine how parents' *own*

involvement may have changed during and after the period of remote schooling brought about by the COVID-19 pandemic. We first examined parents' responses to the question of whether they had become more involved in their child's schooling during the pandemic (and, if so, how much more involved they became). A chi-square test for goodness-of-fit revealed that the proportion of parents who reported each possible level of involvement was quite similar,  $\chi^2(4) = 8.81, p = .066$ . Only 17% of parents reported that they did not become more involved at all. While most parents who reported becoming more involved only did so "a little" (26%) or "moderately" (25%), 31% of parents reported becoming "a lot" (20%) or "a great deal" (11%; see Figure 5 below). This suggests that most parents did in fact become more involved in their child(ren)'s schooling/academics, at least to some extent, during the COVID-19 pandemic.



*Figure 5.* Distribution of parents' responses to an item assessing whether they increased their involvement in their child(ren)'s schooling/academics during the COVID-19 pandemic.

Given that parents' belief scores had consistently predicted their agreement with highly intrusive practices in our prior studies, we explored whether parents with higher belief scores also reported becoming more involved in their child(ren)'s schooling/academics during the pandemic. To test this, we constructed a linear model, with parents' reported increase in involvement during the pandemic entered as the dependent variable and parents' belief scores entered as a continuous predictor. This model revealed that the higher a parent's belief score, the more involved they became during the pandemic,  $B = 0.27$ , 95% CIs = [0.10, 0.44],  $SE = 0.09$ ,  $F(1, 112) = 9.48$ ,  $p = .003$ ,  $r = 0.28$  (see Figure 6 below).

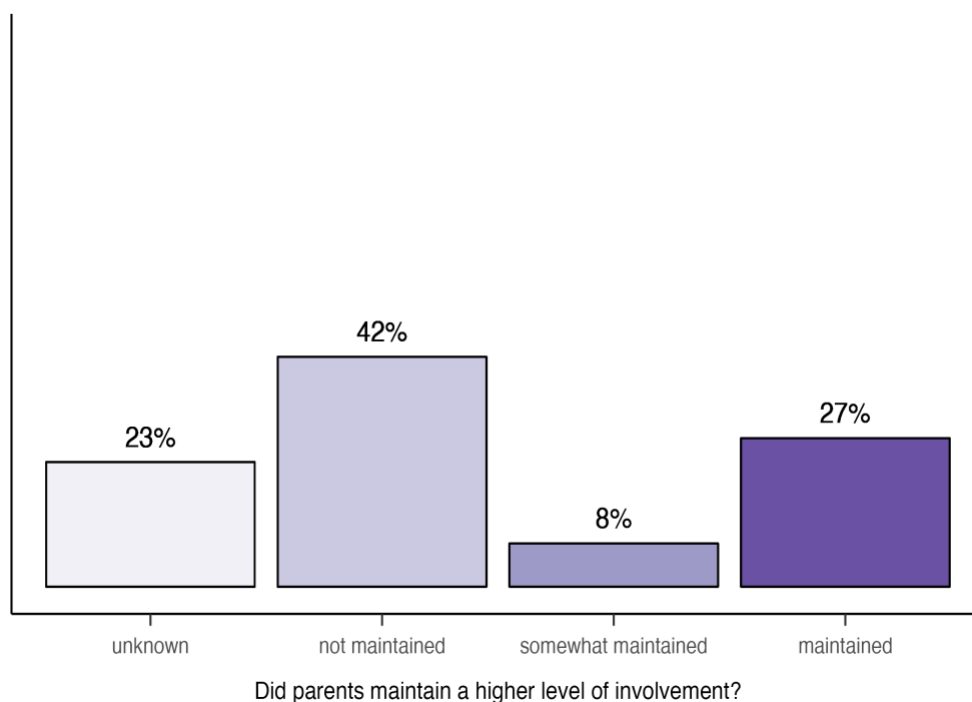


*Figure 6.* Parents' reports of whether their level of involvement in their child(ren)'s schooling/academics changed during the COVID-19 pandemic, plotted as a function of their belief score. Points represent individual data, and the shaded region represents 95% bootstrap CIs.

***Parents' involvement after return to in-person schooling.***

We also wondered whether parents who increased their level of involvement during the pandemic would also report *maintaining* that higher level of involvement, even after most aspects of schooling had returned to their pre-pandemic format. Based on their open-ended responses, parents were sorted into one of four categories: unknown (i.e., it was unclear whether they had maintained a higher level of involvement), not maintained, somewhat maintained, or maintained. A chi-square test for goodness-of-fit

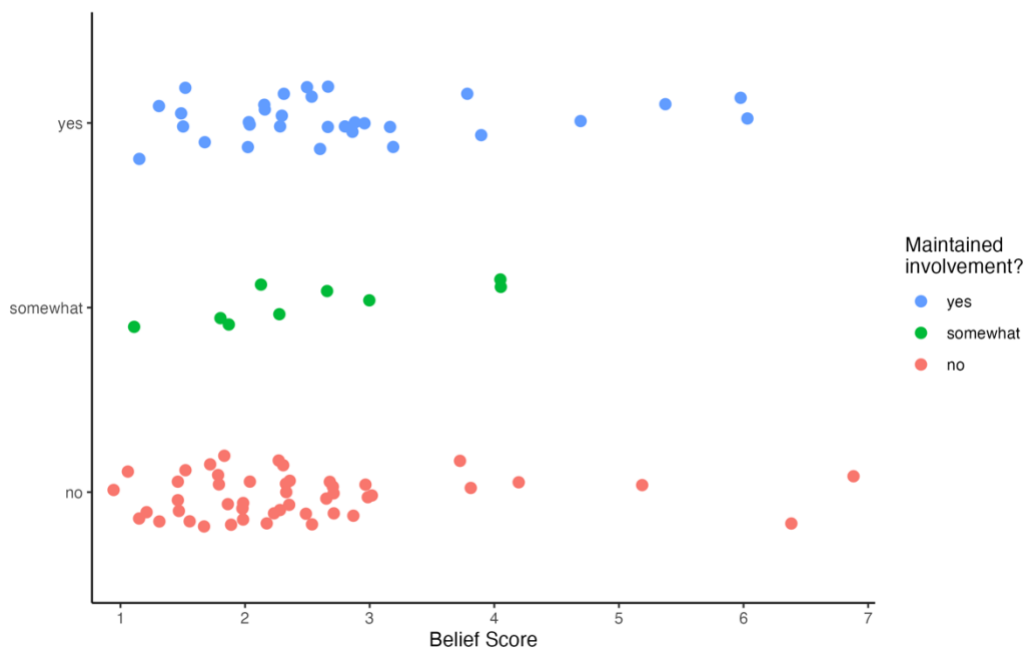
revealed that parents were not evenly distributed across these categories,  $\chi^2(3) = 8.81, p < .001$ . As shown in the figure below, 42% of parents reported that they did not maintain a higher level of involvement after schooling had returned to “normal,” while 8% reported that they stayed somewhat more involved and 27% reported that they did in fact maintain greater involvement (see Figure 7 below).



*Figure 7.* Distribution of parents’ coded responses to a question asking the extent to which they maintained a higher level of involvement in their child(ren)’s schooling/academics.

We also conducted an ordinal regression to explore whether parents’ beliefs predicted whether they maintained a higher level of involvement after schooling had returned to its pre-pandemic format. Since 23% of parents who reported increasing their involvement during the pandemic did not clarify whether they had stayed more involved, we examined only the data from the remaining parents ( $n = 88$ ) – i.e., those who reported

that they had not maintained, had somewhat maintained, or had maintained a higher level of involvement. Surprisingly, we found that parents' beliefs did not predict whether they had maintained a higher level of involvement,  $B = 0.28$ ,  $SE = 0.22$ ,  $OR = 1.33$ ,  $p = .183$  (see Figure 8 below). While we expected that parents with higher belief scores might be especially likely to stay more involved, it is worth noting that the return to in-person schooling removed many opportunities for parental involvement, since children were no longer doing their schooling activities at home. Thus, it may be the case that it simply was not possible for many parents to maintain a higher level of involvement, even if they had wanted to.

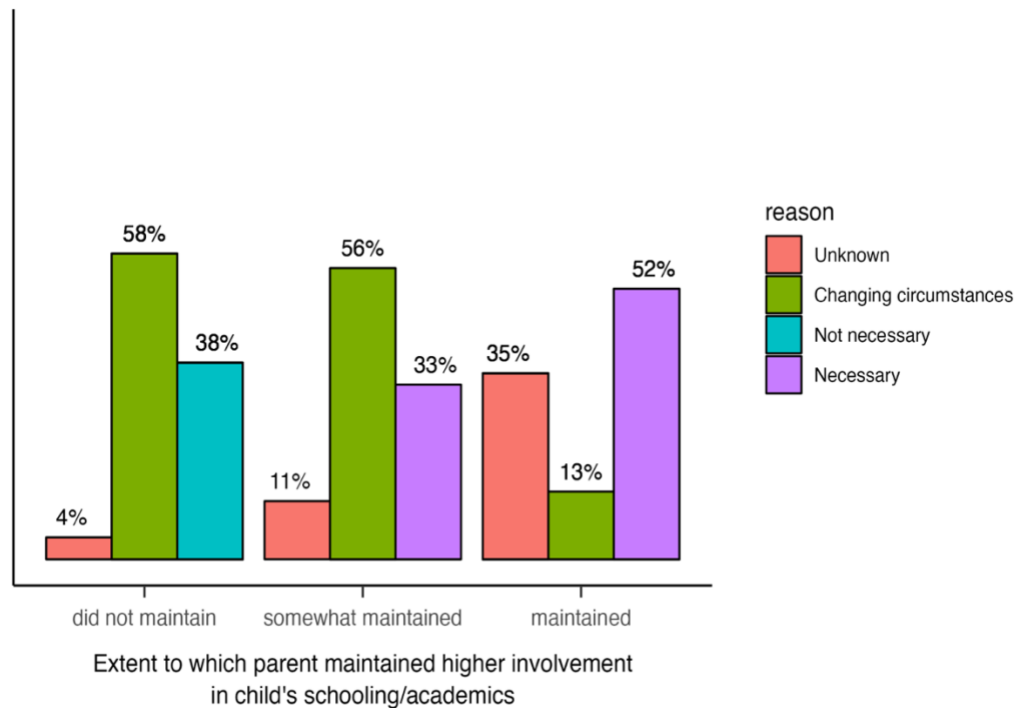


*Figure 8.* Parents' coded responses to a question asking the extent to which they maintained a higher level of involvement in their child(ren)'s schooling/academics, plotted as a function of belief score.

***Parents' reasons for maintaining (or not maintaining) greater involvement.***

We further probed parents' open-ended responses by examining the reasons why they did (or did not) maintain a higher level of involvement after the return to "normal," in-person schooling. Visualizing this data (see Figure 9 below) revealed qualitative differences across parents. Most parents who reported that they would not maintain a higher level of involvement said that this was due to changing circumstances (58%) or greater involvement no longer being necessary (38%). In contrast, more than half (52%) of parents who reported that they would maintain higher involvement said that they would do so because it was necessary.

Taken together, these findings from parents' open-ended responses suggest that some parents increased their involvement during the pandemic due to changing circumstances (and thus reduced their involvement once circumstances had gone back to "normal"). Other parents, however, seemed to increase their level of involvement, with some even finding it "necessary" to stay more involved than they were previously.



*Figure 9.* Percentage of parents who cited each reason as why they did or did not maintain a higher level of involvement in their child's schooling/academics.

## Discussion

Three years (and one worldwide pandemic) later, we found that our results from Study 1 (run in 2020) largely replicated in a new sample of parents. Those with higher belief scores, who believed to a greater extent that parents need to make decisions and solve problems for even young-adult children, agreed more with highly intrusive practices. Interestingly, parents' beliefs did *not* predict their agreement with less intrusive practices, although the direction of the relationship was the same (i.e., parents with higher belief scores tended to agree less with less intrusive practices). This is not entirely surprising, given that this effect has been consistently weak throughout our prior studies (i.e., Study 1 and our prior pilot work).

Critically, however, we found the same interaction as we found in Study 1: parents' belief scores were more strongly predictive of their agreement with highly intrusive practices than with less intrusive practices. Thus, it seems that these relationships between parents' beliefs and their agreement with more or less intrusive practices are quite consistent over time. Mean belief scores and mean ratings of agreement with highly and less intrusive practices were also strikingly similar across studies. The fact that we replicated most of our key findings even after parents (and their children) experienced widespread disruptions to schooling suggests that the beliefs we are exploring are quite a robust predictor of parents' agreement with highly intrusive practices.

Findings from this study also provided insight into how parents' involvement in their child(ren)'s schooling/academics changed during the pandemic. Most parents we surveyed indicated that they increased their involvement to at least some extent during the pandemic. This is not all that surprising – given that the unprecedented circumstances and disruptions to schooling, parents may have felt that they needed to be more present. In some cases, increased parental involvement may even have been required (e.g., children may have needed help accessing their Zoom classroom). However, it was those with higher belief scores who reported increasing their involvement the most. This suggests that even though pandemic-related changes in schooling may have prompted many parents to get more involved, parents' beliefs still influenced *how* involved they became. Interestingly, parents' beliefs did not predict whether they maintained a higher level of involvement after the return to in-person schooling. As discussed above, this may be due to the fact that remote schooling opened up possibilities for parental involvement

that were no longer available once children returned to school (e.g., monitoring the child during class time). Indeed, when asked whether they had maintained a higher level of involvement after the return to in-person schooling, parents who reported that they had not tended to cite the changing circumstances. In contrast, parents who reported maintaining an increased level of involvement tended to say they did so because it was necessary. These findings provide further evidence that intrusive practices from parents may be, at least in part, driven by beliefs about whether parents need to step in and solve problems for their children.

### Study 3

In Studies 1 and 2, we focused on exploring the extent to which general beliefs about whether parents need to make decisions and solve problems for young adults predict parents' agreement with different parenting practices. Interestingly, most parents agreed quite strongly with less intrusive practices, regardless of their beliefs. One reason why this might be the case is that we asked parents in these first two studies to evaluate whether highly or less intrusive practices would be appropriate for *another* parent. It is possible that, when asked to consider what *they themselves* would do in the same scenarios, parents would show a clearer preference in line with their beliefs—for example, those who believe to a greater extent that parents need to make decisions and solve problems for even young-adult children might be more likely to opt for a highly intrusive practice themselves.

Thus, in Study 3, we presented parents with the same scenarios used in Studies 1 and 2. This time, however, we asked parents to not only make third-party judgments (i.e., evaluate how appropriate highly or less intrusive practices would be for another parent), but to also make first-person choices (i.e., indicate what they themselves would do in the same scenarios). This design allowed us to not only replicate Study 1, but also examine whether parents' beliefs would map on to their first-person choices.

In line with Study 1, we predicted that the stronger a parent's belief that parents need to make decisions and solve problems for even young-adult children, the more they would agree with highly intrusive practices. We also predicted that there would be an interaction between belief score and the intrusiveness of a given practice (highly vs. less intrusive). However, given that parents' beliefs did not consistently predict their

agreement with less intrusive practices in Studies 1 and 2, we opted not to make a specific prediction for the present study about the effect of belief score on parents' agreement with less intrusive 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 that parents need to make decisions for and solve problems for young adults, the less likely they would be to opt for less intrusive practices, and the more likely they would be to opt for highly intrusive practices. We did not make specific predictions about parents' likelihood of choosing specific responses (e.g., choosing one specific highly intrusive practice over any other highly intrusive practice).

## **Methods**

### ***Participants.***

Participants were 75 parents recruited from 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.

The final sample of parents ( $N = 70$ ) was 39% female and 73% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

As in Studies 1 and 2, parents were directed to a Qualtrics survey. They were presented with the same four scenarios shown to parents in Studies 1 and 2. Following each scenario, parents read and rated the same items describing highly or less intrusive practices. As in our 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 the four scenarios, rating their agreement with the highly vs. less intrusive practices, and filling out an attention check item, parents were then asked to make first-person choices about what they themselves would do in each of the four scenarios they had just read. Parents were presented with the same four scenarios they had seen earlier. Each scenario was again presented individually and 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 highly or less intrusive practices 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 response could be selected for each.

After making their selections, parents filled out our six-item parent belief scale. Parents were also presented with a failure mindset measure following the belief scale. (Parents’ responses to the failure mindset scale were not included in analyses for this

study and will not be discussed further. In Study 4, we explore the potential role of parents' failure mindsets.)

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

### ***Analysis Strategy.***

As in Studies 1 and 2, linear mixed effects models were constructed to examine whether parents' belief scores predicted their agreement with highly or less intrusive practices. (Note that parents' agreement ratings, which were elicited the first time they saw the four scenarios, were judgments of whether certain practices would be "the appropriate response" for another parent to have in given scenario.)

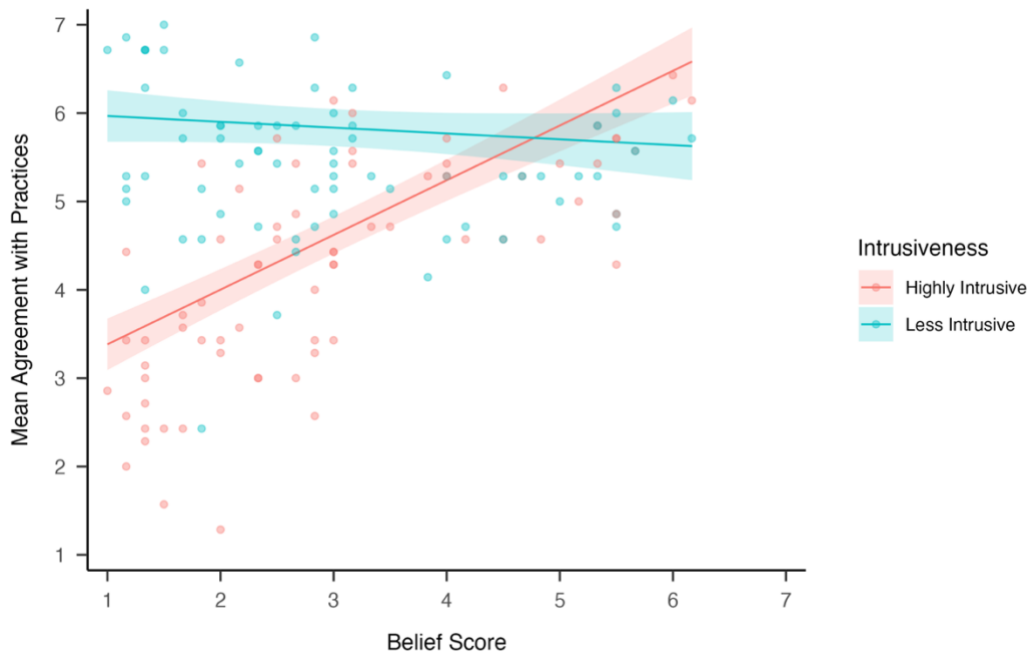
Bayesian multinomial logistic regression models were used to assess whether belief scores predicted whether parents opted for a highly or less intrusive practice when asked what they themselves would do if they were the parent in the given scenario. In addition, frequentist multinomial logistic regression models were used to assess, for each scenario that had more than two practices to choose from, the probability of selecting each possible choice of practice as a function of belief score.

## **Results**

### ***Parents' evaluations of highly or less intrusive practices.***

Analyses examining parents' agreement ratings revealed a significant interaction between belief score and the intrusiveness of the practice,  $B = -0.69$ , 95% CIs = [0.52, 0.72],  $SE = 0.07$ ,  $p < .001$ , marginal  $R^2 = 0.26$  (see Figure 10 below). Additional models

revealed that, as predicted, parents' belief scores positively predicted their ratings of highly intrusive practices ( $B = 0.62$ , 95% CIs = [0.47, 0.76],  $SE = 0.07$ ,  $p < .001$ , marginal  $R^2 = 0.30$ ) but did not predict their ratings of less intrusive practices ( $B = -0.07$ , 95% CIs = [-0.20, 0.07],  $SE = 0.07$ ,  $p < .34$ , marginal  $R^2 = 0.01$ ).

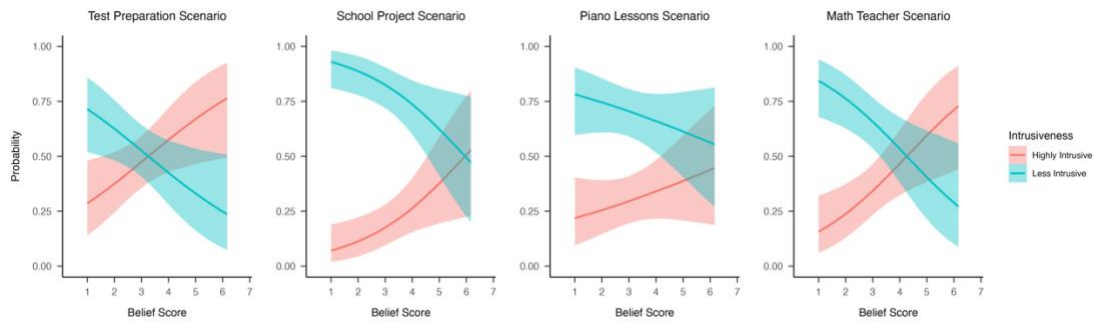


*Figure 10.* Parents' ratings of highly and less intrusive practices in Study 3, plotted as a function of belief score. Points represent individual data, and shaded regions represent 95% bootstrap CIs.

### ***Parents' first-person choices.***

Turning to parents' own choices of what they would do, Bayesian multinomial logistic regression models revealed that, the higher a parent's belief score, the less likely they were to opt for a less intrusive practice; this was true for the test preparation scenario (estimate = -0.41, 95% CIs = [-0.79, -0.06]), the school project scenario (estimate = -0.53, 95% CIs = [-0.97, -0.11]), and the assignment to an inexperienced teacher scenario

(estimate = -0.52, 95% CIs = [-0.93, -0.15]). The only scenario for which belief score did not predict parents' choice of a highly or less intrusive practice was the scenario in which the high-schooler considers quitting piano lessons (estimate = -0.21, 95% CIs = [-0.57, 0.15]). See Figure 11 below for Bayesian conditional effects plots, which show the probability of choosing a highly or less intrusive as a function of belief score.



*Figure 11.* Conditional effects of intrusiveness for parents' first-person choices.

Frequentist multinomial logistic regression models were also used to calculate, within each scenario that had more than two practices to choose from, the probability of selecting each possible highly or less intrusive practice as a function of belief score. These probabilities are visualized in Figures 12-14 below.

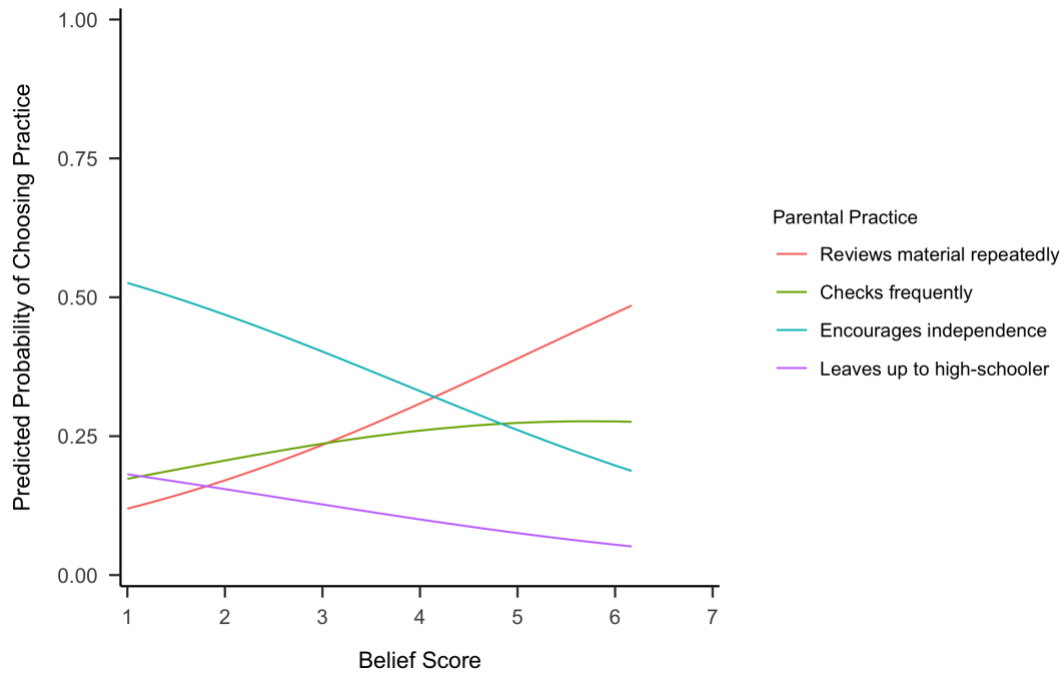


Figure 12. Probability of opting for each practice in response to Scenario 1, plotted as a function of belief score.

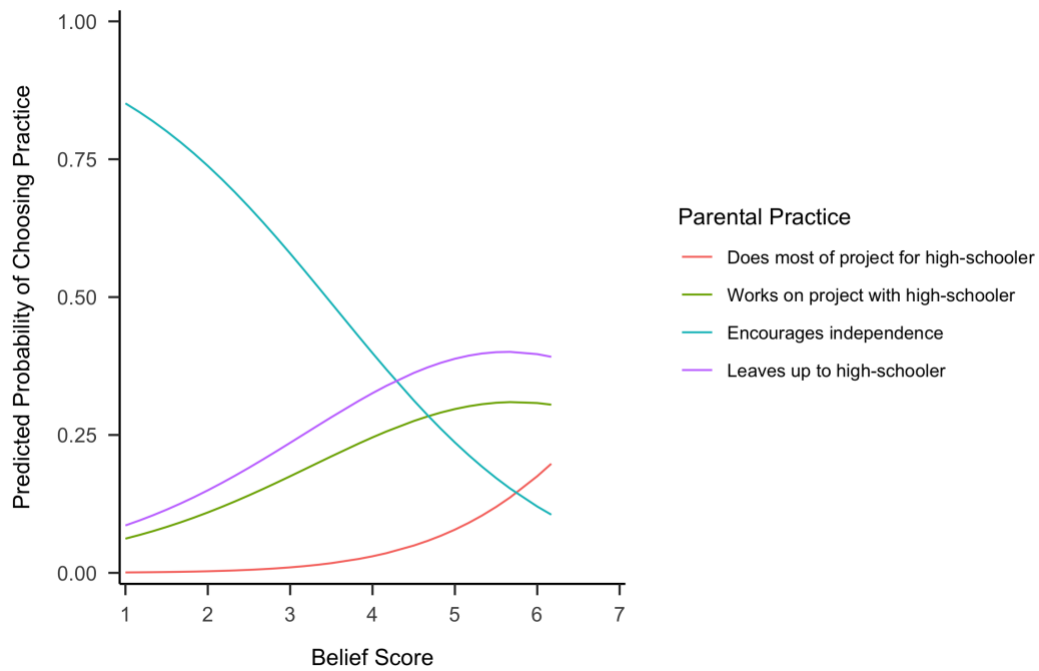
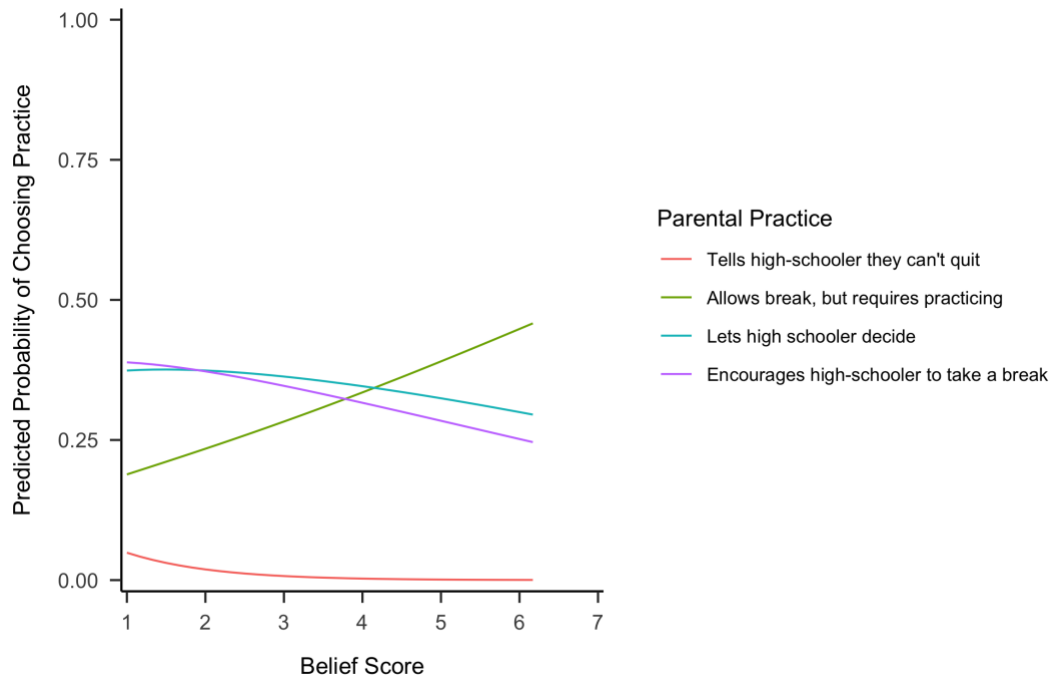


Figure 13. Probability of opting for each practice in response to Scenario 2, plotted as a function of belief score.



*Figure 14.* Probability of opting for each practice in response to Scenario 3, plotted as a function of belief score.

## Discussion

Overall, our findings largely supported our initial hypotheses. Examining parents' evaluations of various practices for another parent, our findings from Studies 1 and 2 were replicated. That is, there was a significant interaction between parents' belief scores and the intrusiveness of the practice, such that the higher a parent's belief score, the more they agreed that highly intrusive practices (vs. less intrusive practices) would be appropriate for another parent to engage in. A separate model examining just parents' agreement with highly intrusive practices found that parents with higher belief scores showed stronger agreement with these practices. The fact that these two findings replicated across three studies suggests a robust relationship between general beliefs

about whether parents need to make decisions and problems for young adults and their agreement with highly intrusive practices.

On the other hand, parents' belief scores did not predict their agreement with less intrusive 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 Study 2. Again, 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. Although it seemed that, to a small extent, parents with stronger beliefs showed less agreement with less intrusive 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 less intrusive practices due to these practices seeming "reasonable" for another parent to engage in. Indeed, our data regarding parents' first-person choices speak to this possibility: while parents with lower belief scores were more likely to opt for less intrusive practices, parents with higher belief scores were more likely to opt for highly intrusive practices. (The only scenario where this pattern did not hold was the least academic 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 less intrusive practices for other parents, they might be less willing to opt for such practices when thinking about what they themselves would do.

### Study 4

In Study 4, we further expanded upon our findings in Studies 1-3 by exploring whether parents adjust their agreement with highly or less intrusive practices depending on the past or typical performance of the adolescent described in the scenarios. In real-life scenarios, we might expect parents to adjust the amount of help they provide to their children based on their child's current performance (Mermelshtine, 2017). However, it is possible that not all parents engage in this adjustment or find it appropriate. In particular, we were curious to see whether parents with higher belief scores would endorse highly intrusive practices even for an adolescent who has excelled in the past.

To examine how an adolescent's past performance might influence parents' agreement with highly or less intrusive practices, we used a design similar to Study 1. However, instead of showing all parents the same scenarios, we randomly assigned them to one of three "performance conditions." Across all three conditions, parents read achievement-related scenarios that were similar to the ones used in our prior studies; 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" at the task at hand (e.g., on past science projects). In contrast, parents in the "negative" performance condition always read that the adolescent had done "poorly" or had "struggled" with similar tasks in the past. (See Tables 3 and Table 4 for the exact language used in the negative and positive 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, in all three performance conditions, the more parents believed that parents need to make decisions for and solve problems for young adult children, the less they would agree with less intrusive practices (although we expected that this effect might be weak). We thought that this relationship would be strongest in the negative performance condition and weakest 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 belief that stepping in to solve problems for one's child 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 less intrusive practices. Since this is a case where the adolescent is already doing very well, we expected that even parents who strongly believe in solving problems for even older children might "step back," as there is little room for the adolescent to improve.

With respect to highly intrusive practices, we predicted that parents with higher belief scores would agree more with highly intrusive 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

highly intrusive 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 with lower belief scores would be more likely to endorse highly intrusive 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 parents' belief scores and agreement with less intrusive practices, and a moderately strong, positive relationship between belief scores and agreement with highly intrusive practices.

## **Methods**

### ***Participants.***

Participants were 150 parents recruited from MTurk via the CloudResearch platform. Participants were recruited in two rounds: 50 parents were recruited for our first round and were all assigned to a positive performance condition; 100 parents were recruited in our second round and were randomly assigned to either an ambiguous/mixed performance condition or a negative performance condition.

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

The final sample of parents ( $N = 144$ ) was 47% female and 66% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

The procedure was similar to that of Study 1. Parents were directed to a Qualtrics survey and were assigned to an ambiguous/mixed performance condition, a negative performance condition, or a positive performance condition. In the ambiguous/mixed performance condition, parents saw the same four scenarios that parents saw in Study 1. In the negative and positive performance conditions, parents saw the four similar scenarios, with modifications to reflect that the adolescent had always done poorly in the past (i.e., the negative performance condition) or that they had always done well in the past (i.e., the positive performance condition; see below for the exact language used). Following each scenario, parents in all three conditions read and rated the same highly and less intrusive 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 different practices, parents filled out the same belief scale used in Study 1.<sup>1</sup> After filling out the

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<sup>1</sup> It should be noted that parents who participated in the second round of data collection - i.e., those who were in the ambiguous/mixed and negative performance conditions - also saw two additional “filler” scenarios prior to the belief scale, while in our first round of data collection - i.e., those in the positive performance condition - did

belief scale, parents in the present study 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 for their time.

### ***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. Similar scenarios were also used in the negative performance condition and in the positive performance condition; however, information about the adolescent's past performance was added and/or modified according to condition. See Tables 3 and Table 4 below 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.

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not see these filler scenarios or items. Parents' responses to these items were not included in analyses and will not be discussed further.

**Table 3.** Exact text used for each of the four scenarios in the negative performance condition.

| Scenario text                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A high-schooler will be taking a test for a class at school. <b>In the past, the student has done poorly on previous tests for this class.</b>                                                                                                                                                                                                                                                                                               |
| 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. <b>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.</b> |
| A few weeks ago, a high-schooler expressed interest in playing piano. Their parent signed them up for piano lessons. <b>After a few weeks of lessons, the high-schooler is struggling to do well at playing piano.</b> 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, <b>who has struggled in previous math classes</b> , has been assigned to a new, inexperienced teacher for their next math class.                                                                                                                                                                                                                            |

**Table 4.** Exact text used for each of the four scenarios in the positive performance condition.

| Scenario text                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A high-schooler will be taking a test for a class at school. <b>In the past, the student has gotten outstanding grades on all of the previous tests for this class.</b>                                                                                                                                                                                                                                                        |
| 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. <b>In the past, the student has always completed projects on time and has received praise from their teacher for the excellence of their projects.</b> |
| A few weeks ago, a high-schooler expressed interest in playing piano. Their parent signed them up for piano lessons. <b>After a few weeks of lessons, the high-schooler is excelling at playing piano</b> , 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, <b>who has excelled in previous math classes</b> , has been assigned to a new, inexperienced teacher for their next math class                                                                                                                                                                                                                |

***Failure Mindset Measure.***

The failure mindset measure was based on 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:

1. Experiencing failure enhances performance and productivity.
2. Experiencing failure facilitates learning and growth.
3. The effects of failure are positive and should be utilized.
4. Experiencing failure debilitates performance and productivity.
5. Experiencing failure inhibits learning and growth.
6. 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.

### ***Analysis Strategy.***

Data for this study were analyzed using only a frequentist approach. Throughout all our analyses, our key dependent variable was parents' agreement (entered as a continuous variable) with the highly or less intrusive practices following each scenario.

Within each of our three performance conditions, we constructed linear mixed effects models to examine the effect of belief score and the level of intrusiveness (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 the practices differed depending on whether the practices were highly or less intrusive. These models all employed the same structure of fixed and random effects as the corresponding models used in our prior studies; participants' belief score, the intrusiveness of parental response, the interaction between the two, 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 highly or less intrusive 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 highly intrusive practices, and the dependent variable in the other model was parents' ratings of less intrusive 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 highly or less intrusive 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 different 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 the adolescent's past performance in predicting parents' ratings of highly or less intrusive practices. We opted to examine ratings of highly and less intrusive practices 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 intrusiveness level). Thus, we were able to examine whether the effect of belief score on parents' ratings differed by condition for both highly and less intrusive practices.

## Results

Within-condition analyses revealed that, consistent with our initial predictions, there was a significant interaction between parents' belief scores and whether the practice they were evaluating was highly or less intrusive; this was true for all three performance conditions (ambiguous/mixed performance condition:  $B = -0.54$ , 95% CIs =  $[-0.70, -0.38]$ ,  $SE = 0.08$ ,  $p < .001$ , marginal  $R^2 = 0.22$ ; negative performance condition:  $B = -0.56$ , 95% CIs =  $[-0.75, -0.37]$ ,  $SE = 0.09$ ,  $p < .001$ , marginal  $R^2 = 0.21$ ; positive performance condition:  $B = -0.87$ , 95% CIs =  $[-1.05, -0.68]$ ,  $SE = 0.09$ ,  $p < .001$ , marginal  $R^2 = 0.42$ ).

### *Parents' evaluations of highly intrusive practices.*

Models examining parents' ratings of highly intrusive practices within each condition revealed that, consistent with our initial predictions, parents' belief scores predicted their ratings of highly intrusive practices in all three conditions (ambiguous/mixed performance condition:  $B = 0.39$ , 95% CIs =  $[0.21, 0.58]$ ,  $SE = 0.09$ ,  $p < .001$ , marginal  $R^2 = 0.26$ ; negative performance condition:  $B = 0.48$ , 95% CIs =  $[0.30, 0.66]$ ,  $SE = 0.09$ ,  $p < .001$ , marginal  $R^2 = 0.31$ ; positive performance condition:  $B = 0.71$ ,

95% CIs = [0.55, 0.88], SE = 0.09,  $p < .001$ , marginal  $R^2 = 0.36$ ). These effects held even after controlling for parents' failure mindsets (ambiguous/mixed performance condition:  $B = 0.34$ , 95% CIs = [0.14, 0.54], SE = 0.10,  $p = .001$ , marginal  $R^2 = 0.27$ ; negative performance condition:  $B = 0.46$ , 95% CIs = [0.25, 0.68], SE = 0.11,  $p < .001$ , marginal  $R^2 = 0.31$ ; positive performance condition:  $B = 0.68$ , 95% CIs = [0.47, 0.89], SE = 0.11,  $p < .001$ , marginal  $R^2 = 0.36$ ).

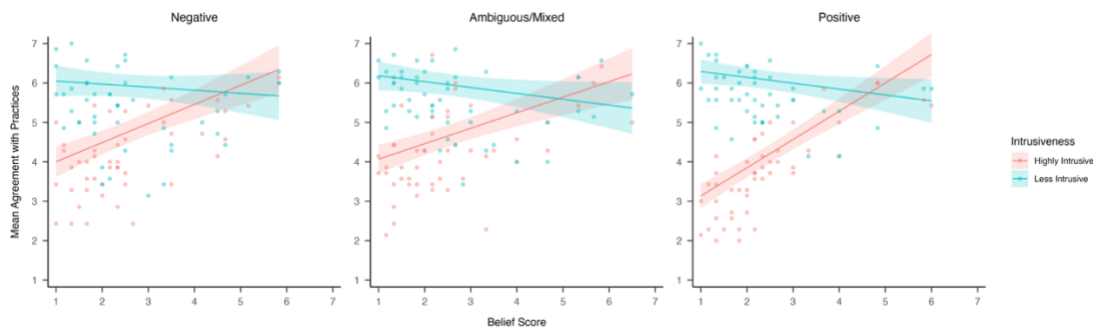
Comparing across the performance conditions, we found a significant interaction between belief score and condition ( $p = 0.04$ , marginal  $R^2 = 0.31$ ). Follow-up analyses found that, consistent with our initial predictions, the relationship between belief score and ratings of highly intrusive practices was stronger in the positive performance condition than in the ambiguous/mixed performance condition ( $B = 0.32$ , 95% CIs = [0.07, 0.58], SE = 0.13,  $p = 0.01$ , marginal  $R^2 = 0.32$ ). However, counter to our initial predictions, there was no difference between the ambiguous/mixed and negative performance conditions ( $B = 0.09$ , 95% CIs = [-0.17, 0.35], SE = 0.13,  $p = 0.69$ , marginal  $R^2 = 0.28$ ), nor was there a difference between the negative and positive performance conditions ( $B = -0.23$ , 95% CIs = [-0.48, 0.01], SE = 0.13,  $p = 0.07$ , marginal  $R^2 = 0.33$ ).

### ***Parents' evaluations of less intrusive practices.***

Models examining parents' agreement with less intrusive practices within each condition revealed that belief scores did not predict parents' ratings of less intrusive practices in the ambiguous/mixed performance ( $B = -0.15$ , 95% CIs = [-0.31, 0.008], SE = 0.09,  $p = 0.06$ , marginal  $R^2 = 0.05$ ) or the positive performance condition ( $B = -0.15$ , 95% CIs = [-0.30, 0.01], SE = 0.08,  $p = 0.06$ , marginal  $R^2 = 0.07$ ). Counter to our predictions, however, belief score also did not predict their ratings of less intrusive

practices in the negative performance condition ( $B = -0.08$ , 95% CIs =  $[-0.29, 0.13]$ ,  $SE = 0.11$ ,  $p = 0.47$ , marginal  $R^2 = 0.02$ ).

Comparing across performance conditions, we found no significant interaction between belief score and condition ( $p = 0.81$ , marginal  $R^2 = 0.05$ ), counter to our initial predictions. Follow-up analyses also revealed no differences between conditions in the relationship between belief score and ratings of less intrusive practices (ambiguous/mixed vs. positive:  $B = 0.0001$ , 95% CIs =  $[-0.22, 0.22]$ ,  $SE = 0.13$ ,  $p = 0.99$ , marginal  $R^2 = 0.06$ ; ambiguous/mixed vs. negative:  $B = 0.07$ , 95% CIs =  $[-0.19, 0.33]$ ,  $SE = 0.12$ ,  $p = 0.56$ , marginal  $R^2 = 0.03$ ; positive vs. negative:  $B = 0.07$ , 95% CIs =  $[-0.19, 0.34]$ ,  $SE = 0.14$ ,  $p = 0.60$ , marginal  $R^2 = 0.05$ ; see Figure 15 below).



*Figure 15.* Parents' ratings of highly and less intrusive practices within each performance condition, plotted as a function of belief score. Points represent individual data, and shaded regions represent 95% bootstrap CIs.

## Discussion

Taken together, these results suggest that the relationship between parents' beliefs and their agreement with different practices is remarkably consistent, even when the past performance of the adolescent on the receiving end of these practices is varied. As we initially predicted, we found effects similar to what we had found in our prior studies

when examining each of the performance conditions separately. That is, within each of the performance conditions, parents with higher belief scores (i.e., who believed to a greater extent that parents need to make decisions and solve problems for young adults) were more likely to agree highly intrusive practices (as we expected). This was true even after controlling for parents' beliefs about whether failure is enhancing or debilitating. Parents' beliefs did not predict their agreement with less intrusive practices in any of the performance conditions.

The key difference we did find across conditions was that parents' beliefs most strongly predicted their agreement with highly intrusive practices when the recipient of those practices was an adolescent who had excelled in the past<sup>2</sup>. The fact that parents with higher belief scores still agreed with highly intrusive practices when the adolescent had done well is notable. Indeed, parents with lower belief scores seemed to adjust their agreement with these practices. That is, in response to the adolescent doing well, these parents "stepped back" by lowering their agreement with highly intrusive 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 parents needing to make decisions and solve problems for even young-adult children, did not seem to adjust their endorsement of highly intrusive practices depending on the adolescent's performance. Even in the face of evidence that the adolescent is doing well

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<sup>2</sup> This effect was significantly stronger in the positive performance condition relative to the ambiguous/mixed performance condition. While the difference between the negative and positive performance conditions was not significant, there is a striking qualitative difference evident in the visualizations of this data; see Figure 15.

(and thus may not need much parental assistance), these parents continued to agree that intrusive help was appropriate.

Surprisingly, parents did not adjust their agreement with less intrusive practices in the ways we had initially expected. Parents' belief scores did not predict their agreement with less intrusive practices in any of the performance conditions, even where we had most expected them to – i.e., when the adolescent had performed poorly in the past. This is surprising because one might expect that parents with higher belief scores would be especially unlikely to agree with less intrusive practices when the adolescent was most at risk of not performing well. It is possible that, in this case, parents inferred that the adolescent had little motivation to do well, and that less intrusive practices 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 less intrusive practices.)

Overall, this pattern of findings suggests that, in general, parents' beliefs about the need to make decisions and solve problems for young-adult children similarly predict their agreement with highly and less intrusive practices for adolescents whose past performance varies. While parents with lower belief scores do seem to adjust their agreement with highly intrusive practices for an adolescent who has done well in the past, parents with high belief scores, in contrast, do not seem to calibrate at all.

### **Chapter 3: What messages might “intrusive” practices convey?**

Chapter 2 revealed one driver of intrusive practices among parents: namely, beliefs about whether parents *need* to step in and solve problems for their children, even once they have reached young adulthood. We found that parents tend to be those who endorse this belief also tend to agree that another parent should engage in highly intrusive practices, such as doing a science project for their adolescent child. In Chapter 3, we turn from examining beliefs that predict agreement with intrusive practices among parents to instead exploring how adults in general construe different amounts of help (including intrusive help), particularly when provided by teachers. Examining how adults think about help – and the messages it might send – provides key context for understanding why some adults might choose to engage in intrusive help while others might not (a question we addressed in the previous chapter and continue to explore in Chapter 4). Here, we aimed to investigate what messages adults think different amounts of help might convey about those who receive this help (i.e., students) as well as those who give it (i.e., teachers).

There is reason to believe that intrusive help could convey negative messages about those who receive it. After all, intrusive help is linked to negative motivational consequences among younger (Leonard et al., 2021) and older (Schiffrin & Liss, 2017) children. Moreover, we know from work in the achievement motivation literature that teachers’ practices often affect students’ motivation via the messages they convey (e.g., about whether their teacher believes students are capable or that their abilities can change; Muenks et al., 2020). Thus, intrusive help could be sending the message that the students are incapable or that they cannot improve.

Indeed, there is evidence that help more generally can send messages about ability that even young children are able to detect. Sierksma & Shutts (2020) presented 4- to 6-year-old children with a scenario in which a teacher is in a classroom with two groups of students who are working on the same task. After seeing the teacher offer help to one group and not another, even the youngest children in the sample thought that the group who was offered help was less smart. These findings suggest that even being offered an unspecified amount help can signal lower competence to a third-party observer.

However, several open questions remain. What inferences might (adult) observers make about students' competence when a teacher offers different students varying *amounts* of help (including intrusive help) on the same task? Moreover, might any differences in students' perceived competence be especially pronounced when there is an obvious contrast in the amounts of help they receive? For instance, do adult observers think that a student who is given a hint on a task is more competent when it is clear that another student received more help - perhaps even an intrusive level of help - on the same task?

In the present studies, we used a third-party paradigm similar to that created by Sierksma and Shutts (2020) to examine what messages might be conveyed when a teacher offers different amounts of help, including intrusive help, to different students. We opted to build upon this paradigm and examine help provided by teachers, rather than parents, because teachers are another critical source of help for children and adolescents and also play an important role in students' developing views of their own abilities (for a review, see Muenks, Wigfield, & Eccles, 2018). Like parents, teachers may also engage in intrusive (rather than merely supportive) helping behaviors. Exploring what adults

think about help from teachers allows us to not only gain insight into what messages might be sent when teachers provide different amounts of help to their students, but it also provides an opportunity to see how adults think about help (including intrusive help) outside the context of parenting specifically. (We explore what messages *parents'* help might convey in Chapter 4.)

In the first two studies of this chapter (Studies 5 and 6), we presented adult participants with one of several scenarios. In one scenario, the teacher offers contrasting amounts of help to different students; in the other scenarios, the teacher provides help to just one student (and the amount of help they provide varies between the scenarios). Students were offered help that ranged from being allowed to do the task on their own to being intrusively helped (i.e., the teacher took over and did the task for them). Critically, this design allowed us to examine the impact of 1) the amount of help the teacher provided and 2) whether or not there was information available to the observer about how much other students were helped.

We asked adult participants to make two main types of judgments. First, we asked them to make judgments about the students' competence; based on the findings from Sierksma and Shutts (2020), we expected that information about how much the students were helped might influence how competent participants thought the students were. We also asked participants about what they thought the teacher was conveying about students' abilities – i.e., whether they thought the teacher was conveying that students' abilities were malleable or more fixed. Such perceptions - perceptions of one's level of ability as well as whether a teacher believes that level of ability can change – play an important role in shaping motivation (Muenks et al., 2020; Muenks, Yan, & Telang,

2021). When students think their teacher believes that ability is “fixed” and cannot change, they are less likely to engage in behaviors that would benefit their learning, such as seeking out challenges (Muenks et al., 2021). While some potential cues to teachers’ beliefs have been studied heavily (many of these being quite explicit cues, e.g., teacher’s remarks about their teaching philosophy; Rattan et al., 2018), the amount of help teachers provide is relatively underexplored, and perhaps more implicit, cue that also might reveal something about what a teacher believes about their students’ abilities.

After exploring how different amounts of help might shape adults’ inferences about students and teachers in Studies 5 and 6, we turn towards examining how we might buffer against negative inferences when a teacher provides a student with a large amount of help. Study 7 specifically investigates how a teacher’s verbal framing of their help might help mitigate negative judgments about students’ competence as well as perceptions of the teacher as having more of a fixed mindset about students’ abilities.

### **Study 5**

In Study 5 (pre-registered: <https://osf.io/kh8y5>), we investigated whether adults use the amount of help that teachers offer a student to a) make judgments about how competent the teacher perceives their students to be and b) to form perceptions of the teacher’s mindset, or whether the teacher seems to be conveying that students’ abilities are fixed or malleable. The specific amounts of help we examined were: 1) giving no help and allowing the student to do a puzzle on their own, 2) giving a hint to the student to help them do the puzzle, and 3) doing a puzzle for the student.

We examined these different amounts of help for a few reasons. First, including specific amounts of help allowed us to expand upon prior findings from Sierksma and

Shutts (2020), who found that a teacher simply offering an unspecified amount of help to one group and not another was enough to convey to observers that the former group was less competent. Here, we explore whether the amount of help matters. As in Sierksma and Shutts (2020), one student is allowed to do the puzzle task on their own. However, we also include two other students: one who is given a hint, and another for whom the teacher steps in and does the puzzle for them. We chose the latter case so that we could specifically examine what messages intrusive help might convey. The former case, where the teacher gives a hint, acted as a “middle ground” between the other two forms of help. Moreover, it allowed us to see how a more autonomy-supportive response might compare to a more intrusive form of help in terms of the messages it conveys.

We assigned participants in this study to either a “contrast” condition or to one of three “individual” conditions. Participants in the individual conditions were told about a teacher and one of their students; what varied between these three conditions was the amount of help the teacher offered the student. These conditions allowed us to explore how these different amounts of help, considered in isolation, might shape adults’ inferences about the students’ competence as well as the teacher’s mindset. In our “contrast” condition, participants were introduced to a teacher and their three students and were told that the teacher offers a different amount of help to each student (i.e., allows the first student to do the puzzle on their own, gives a hint to the second student, and does the puzzle for the third student). This condition allowed us to explore how adults’ inferences might also be shaped by the presence or absence of information about how a teacher helps *other* students completing the same task (i.e., an identical puzzle). As noted in the Introduction, such contrasts in teachers’ input are ubiquitous in the

classroom. They might even communicate messages above and beyond those conveyed simply by the amount of help the teacher offers each student – for instance, a student given a hint to help them complete a puzzle might be seen as somewhat competent when considered in isolation, but they might be rated as more competent when it is clear that another student had the same puzzle done for them.

In line with our findings from pilots we had run previously (that used the same design), we hypothesized that, in the individual and contrast conditions, participants' ratings of the students' competence would be associated with the amount of help the teacher provided the students. That is, we thought participants would rate the student who was allowed to do the puzzle on their own as most competent and the student for whom the teacher did the puzzle as least competent. We predicted that the competence of the student who was given the hint would be in the middle - that is, it would be rated as significantly lower than that of the student given no help, but significantly higher than the student for whom the teacher did the puzzle.

In addition to examining the data from the contrast and individual conditions separately, we also examined the data from these conditions together, as this allowed us to explore how participants' competence ratings might be shaped by the presence or absence of information about how much help other students were given (which is the key difference between the contrast condition and the individual conditions). We hypothesized that, when the data from the contrast and individual conditions were considered together, there would be a significant interaction between condition (contrast vs. individual) and the amount of help offered. We expected that participants would rate both the student who was given a hint and the student who was allowed to do the puzzle

on their own as more competent in the contrast condition (where they would know that other students received more help on the same task) than in the individual condition (where they would not know how other students were helped). We expected that the student for whom the teacher did the puzzle would be rated similarly low on competence regardless of whether there was contrasting information available about how much help other students received.

We also examined participants' perceptions of the teacher's mindset, or of whether the teacher seemed to be conveying that students' puzzle abilities are fixed (i.e., that *only some* students can get good at puzzles) or malleable (i.e., that *all* students can get good at puzzles). It is important to note that we asked all participants to provide these judgments only once, after they saw the teacher interact with one or three of their students and provided competence ratings for each student. Thus, we were able to straightforwardly compare participants' perceptions of the teacher's mindset across all conditions. We predicted that participants would perceive the teacher's mindset as being more fixed in conditions where they saw the teacher step in and do a puzzle for a student compared to conditions where the teacher did not exhibit this behavior. We reasoned that this type of intrusive help, where the teacher simply takes over and does not provide an opportunity for the student to try on their own, might convey a belief that some students cannot improve their puzzle abilities.

## Methods

### *Participants.*

Participants were 160 adults (ages 18+) recruited from MTurk via the CloudResearch platform. Any respondent who failed a bot check (which involved

identifying the object in an image) in the beginning of the survey was excluded from participating. All participants provided their consent electronically prior to their participation.

The final sample ( $N = 160$ ) was 71% White, 43% female, and 58% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

Participants were directed to a Qualtrics survey, where they were randomly assigned to either an individual condition or a contrast condition (described above). Those in the individual conditions saw a teacher interact with one of their students; they were randomly assigned to see the teacher 1) provide their student no help, 2) give their student a hint, or 3) do the puzzle for their student. This resulted in three individual conditions varying in the amount of help provided by the teacher.

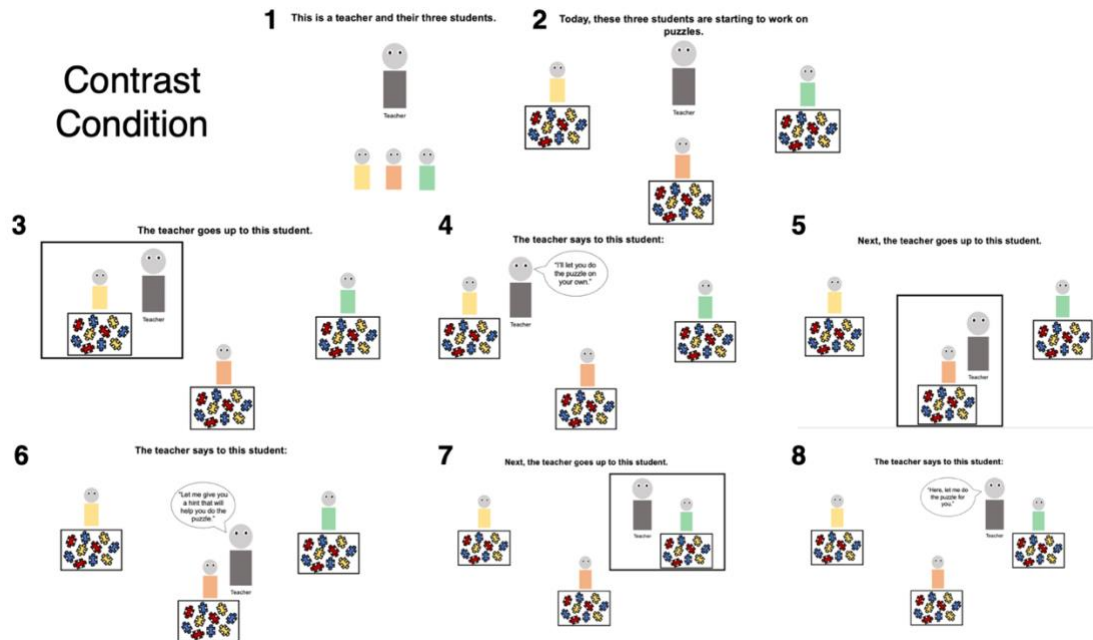
Participants in the contrast condition were first presented with a teacher and their three students, who were each working on the same puzzle task. Participants saw the teacher offer a different amount of help to each student. The teacher allowed one student to do the puzzle on their own, gave another a hint, and did the puzzle for another student. The order in which participants saw the teacher offer these different amounts of help was counterbalanced. (See Figure 16 below for the actual stimuli shown to participants.)

Participants in the individual conditions were first presented with a teacher and their one student. Depending on which individual condition they were randomly assigned to, they saw the teacher allow the student to do a puzzle on their own, give the student a

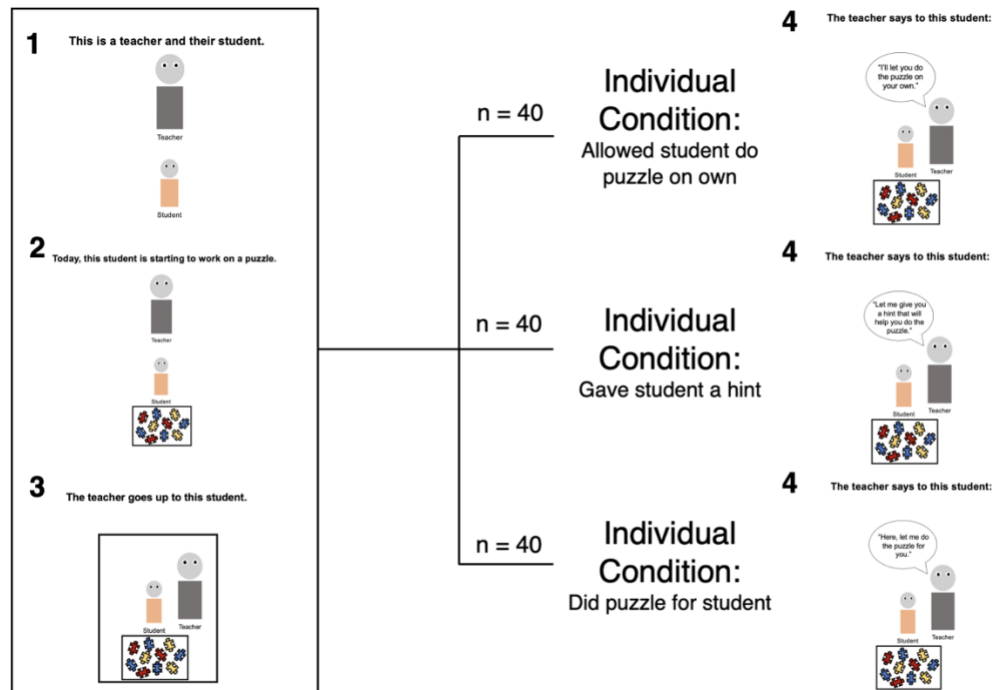
hint, or do the puzzle for the student. (See Figure 17 below for the actual stimuli shown to participants.)

After participants were presented with information about how the teacher helped their student(s), they were asked to judge how competent the teacher thought each student was. Those in the individual conditions only rated the competence of one student, since they were told about a teacher and only one of their students. However, in the contrast condition, participants provided three competence ratings, one for each of the students they had been shown. For each competence rating, participants were reminded of what the teacher had said to that specific student prior to being asked to make their rating.

Following these competence ratings, participants in all conditions were then asked about their perceptions of the teacher's mindset (i.e., whether they thought the teacher was conveying that puzzle ability is fixed or malleable). Note that, because all participants only saw one teacher, they were only asked these questions once. Following these questions, participants filled out basic demographic questions and were then fully debriefed and compensated for their time.



*Figure 16.* Stimuli shown to participants in the contrast condition of Study 5. Participants saw each of these images one at a time; note that participants may not have seen this specific order, since we counterbalanced the order in which each amount of help was presented. (The image numbers are for ease of presenting the flow of the study and were not shown to participants.)



*Figure 17.* Stimuli shown to participants in the individual condition of Study 5. Participants saw each of these images one at a time; the last image that participants saw depended on which of the three individual conditions they were assigned to. (The image numbers are for ease of presenting the flow of the study and were not shown to participants.)

### ***Competence Judgments.***

For each student they were shown, participants were asked, “How competent does the teacher think this student is at doing puzzles?” The Likert scale provided ranged from 1 (“not at all competent”) to 5 (“extremely competent”). Participants always made these ratings after seeing all of the stimuli corresponding to their assigned condition. That is, those in the contrast condition saw the teacher provide their three students with different amounts of help, and *then* were asked to (separately) rate the competence of each student (after seeing what the teacher had done for all three students). Those in the individual

condition rated the competence of one student after they had seen how much help they were offered.

### ***Perceptions of teacher's mindset.***

After the competence ratings, participants were asked to “think back to everything the teacher said and did as they interacted with their student(s).” Following this were two questions: 1) “To what extent did the teacher’s actions convey that only some students can get good at puzzles?” and 2) “To what extent did the teacher’s actions convey that all students can get good at puzzles?” Each question contained a Likert scale ranging from 1 (“not at all”) to 5 (“a great deal”), with an additional option at the end (6 - “not sure/don’t know”).

We chose to exclude data (only from analyses involving these items) from participants who provided a response of “not sure/don’t know” to either or both of the two aforementioned items. Previous piloting indicated that this response option was not frequently chosen. Thus, given that most participants seemed to feel that the information they were presented was enough for them to form a perception of the teacher’s mindset, we decided to exclude data from participants who felt that they did not have enough information to make these judgments.

After excluding responses from participants who chose “not sure/don’t know,” we created overall mindset perception scores by reverse scoring participants’ ratings on the first of the two aforementioned items and then averaging these with ratings from the second item. This resulted in higher (overall) scores indicating that the participant perceived the teacher as conveying more of a growth mindset.

### ***Analysis Strategy.***

Because participants in our contrast condition provided three competence ratings (one for each student) and participants in our individual conditions only provided one competence rating, there are technically two differences between the conditions. One is of course the key difference we are interested in: whether or not the presence or absence of information about how much help the teacher provided other students influences participants' competence ratings. However, since there are repeated measures within the contrast condition, this introduces a second difference between the conditions. Our prior pilot findings suggested that this second difference is not a concern; a linear mixed effects model, which included a random effect of participant, revealed a singular fit and an estimate of zero variance for the random effect (within the contrast condition). These results indicated that we could drop the random effect and use a linear model, which would treat participants' competence ratings as independent observations.

For the present study, we used a similar process to check whether we could treat the data from the contrast condition as independent. First, looking at data *only* from the contrast condition, we ran a linear mixed effects model examining the effect of the amount of help on participants' competence ratings; this model included a random effect of participant to account for the repeated measures. We checked whether the estimate of the random effect variance was zero (and the model fit was singular, as indicated by a TRUE value returned by the `isSingular` function in R). Both were true (as reported in more detail below), so we moved forward with our subsequent analyses, which treated the data from the contrast condition as independent observations.

We first analyzed participants' ratings of the students' competence. We constructed linear models to examine whether, within the contrast and individual

conditions, participants would rate those who received more help as less competent (and vice versa). These models allowed us to evaluate whether the amount of help the teacher provided (allowing the student to do the puzzle on their own, giving the student a hint, or doing the puzzle for the student) was indeed a significant predictor of competence ratings within each condition. We then used the *eemmeans* package in R to conduct pairwise comparisons between the three levels of help.

After examining participants' competence ratings within each condition, we then examined whether there was an *interaction* between condition (contrast vs. individual) and the amount of help provided. To do this, we constructed a linear model where condition, amount of help, and their interaction entered as predictors of participants' ratings of the students' competence. We also used the *emmeans* package to examine students who received the same amount of help (e.g., were given a hint) were rated as more competent in the contrast condition (when information was available about how other students were helped) or in the individual condition (when information about how other students were helped was *not* available).

In addition to exploring whether each student was rated as more competent in the contrast or individual condition, we also conducted an exploratory analysis where we examined the *differences* between students (e.g., the difference in competence between the student given no help and the student who the teacher did the puzzle for). We were curious to see whether these differences would be larger or smaller depending on whether there was information available about how other students were helped. Our prior pilot work indicated an attenuation effect: that is, students who received more help were generally rated as less competent than those who received less help, but this difference

was smaller in the individual condition (where participants saw only one student receive help) than in the contrast condition (where participants saw all three students receive different amounts of help). (Note that there was one exception here: the perceived difference in competence between the student given no help and the student given a hint was similar across the contrast and individual conditions). For the current study, we explored whether a similar attenuation effect arose by using a linear model containing condition (contrast vs. individual), amount of help, and their interaction as predictors. We examined potential differences by varying the reference condition of this model.

Turning to participants' perceptions of the teacher's mindset, we constructed a linear model to examine whether these perceptions differed by condition. We used *eemmeans* to conduct follow-up pairwise comparisons between conditions.

We also conducted a few checks to ensure the robustness of our findings. Because we excluded responses of "not sure/don't know" from our analysis of participants' mindset perceptions, we also examined whether the results of our other key analyses (involving competence ratings) changed as a result of including or excluding the data from these same individuals. Additionally, because we counterbalanced the order in which participants saw the teacher offer different amounts of help in the contrast condition, we re-ran our key analyses with this order as a predictor variable; this allowed us to see whether this order interacted with our key independent variables.

## **Results**

### ***Robustness checks.***

Initial analyses indicated that the order in which participants saw the teacher offer different amounts of help in the contrast condition did not interact with help amount in

predicting competence or mindset perceptions (all  $ps > .05$ ). Thus, we did not include order as a predictor in our subsequent analyses.

Additionally, we checked to see whether excluding participants who answered “not sure/don’t know” on our mindset perception items would influence our findings. (Recall that we could not calculate these participants’ overall perception of the teacher’s mindset, so we planned to exclude these participants from our mindset analyses and include them in our analyses examining competence perceptions). We found that 5 participants total provided this answer, all of whom were in the individual conditions (4 saw the teacher give their student a hint and 1 saw the teacher allow their student to do the puzzle on their own). Participants who gave this response all did so on the item that asked, “To what extent did the teacher’s actions convey that all students can get good at puzzles?”. We found that excluding these participants did not change any of our findings on participants’ competence ratings, so we moved forward with our plan to include them in analyses when possible.

***Confirming lack of random effect variance for contrast condition.***

We also examined whether the three competence ratings made by participants in the contrast condition could be treated as independent observations. Per our preregistered analysis plan, we fit these data to a linear mixed effects model with a random effect of subject. A summary of this model revealed zero random effect variance. Checking the model using the “isSingular” function revealed that there was indeed a singular model fit. Taken together, these results confirmed that we could move forward with treating these ratings as independent (thus enabling us to use a simple linear model and do a straightforward comparison of participants’ competence judgments).

***Were those who received more help rated as less competent?***

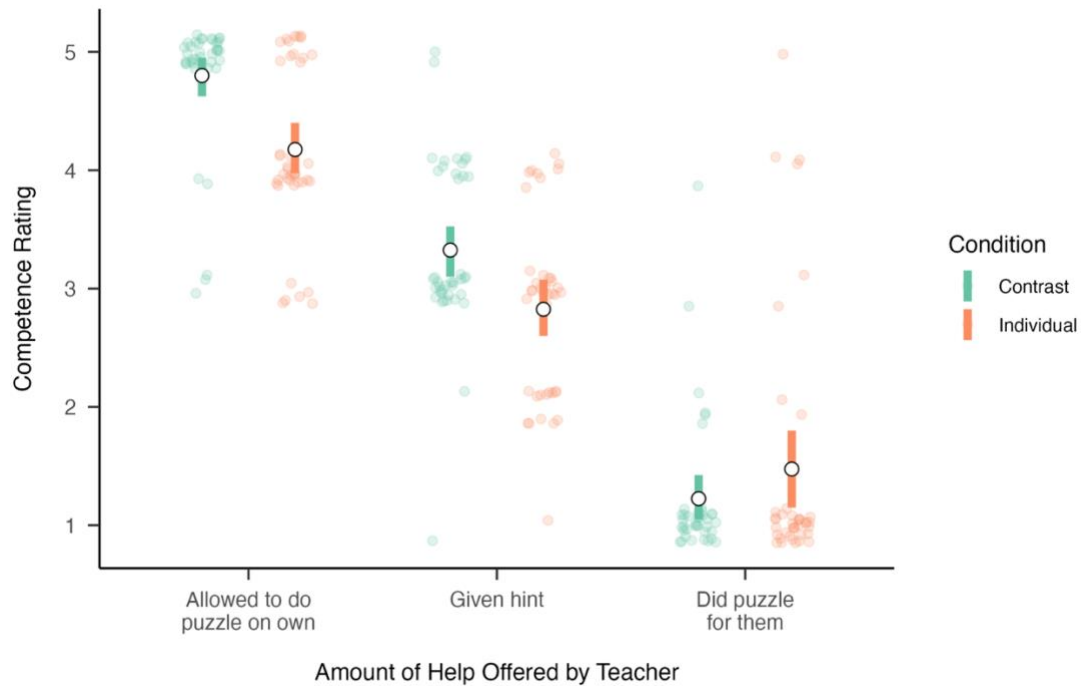
Having confirmed that we could use a linear model for participants' competence ratings, we first examined whether participants in the contrast condition rated students who received more help as being less competent (and vice versa). A linear model revealed that this was in fact the case,  $F(2, 117) = 313.7, p < .001, R^2_{\text{adj}} = 0.84$  (see Figure 18 below). Follow-up pairwise comparisons revealed significant differences between all possible pairs of the three students (all  $ps < .001$ ). That is, participants rated the student who was allowed to do the puzzle on their own ( $M = 4.80, SD = 0.56$ ) as being more competent than the student who was given a hint ( $M = 3.33, SD = 0.73$ ); the student whom the teacher did the puzzle for ( $M = 1.23, SD = 0.62$ ) was rated as less competent than both of the others.

Next, we examined whether similar differences in the perceived competence of the different students would arise in the individual conditions. A linear model revealed that this was the case: those in the individual conditions rated those who were offered more help as being less competent,  $F(2, 117) = 99.73, p < .001, R^2_{\text{adj}} = 0.62$  (see Figure 18 below). Follow-up pairwise comparisons revealed that, as in the contrast condition, the student who was allowed to do the puzzle on their own ( $M = 4.18, SD = 0.68$ ) was rated as more competent than the student who was given a hint ( $M = 2.83, SD = 0.78$ ), and the student whom the teacher did the puzzle for ( $M = 1.48, SD = 1.06$ ) was rated as less competent than both of the others (all  $ps < .001$ ).

***How did contrasts in help influence ratings of the students' competence?***

After examining participants' competence ratings within each condition, we combined the data from both conditions to see whether there was an interaction between

condition (contrast vs. individual) and the amount of help provided. A linear model revealed that there was in fact an interaction,  $F(5, 234) = 143.2, p < .001, R^2_{\text{adj}} (\text{all predictors}) = 0.75$ . We then conducted follow-up pairwise comparisons to explore whether students who received the same amount of help were perceived as more competent in the contrast condition (vs. the individual condition). Both the student who was allowed to do the puzzle on their own and the student who was given a hint were rated as more competent in the contrast condition than in the individual condition ( $p < .001$  and  $p = .003$ , respectively). The student whom the teacher did the puzzle for was rated equally (in)competent in both conditions ( $p = .140$ ). These findings aligned with our initial predictions. That is, as we expected, doing the puzzle for the student was such a strong (negative) cue that observers rated the student who received this help similarly across the contrast and individual conditions. In contrast, the student who was allowed to do the puzzle on their own and the student who was given a hint were both perceived as more competent when it was clear that other students had received more help.



*Figure 18.* Participants' competence ratings for each student by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

In addition to comparing participants' perceptions of students who received the same amount of help across the contrast condition and individual condition, we conducted an exploratory analysis where we compared participants' perceptions of students who received different amounts of help. Recall that our within-condition analyses revealed that students who received more help were rated as less competent. We explored whether such differences in perceived competence would be larger in the contrast condition, where participants saw how much other students were helped, than in the individual condition, where participants did not see how much other students were helped.

By changing the reference group of our interaction model (described earlier in this section), we saw that this was generally the case. Participants in both the contrast and individual conditions rated the student who was allowed to do the puzzle on their own and the student who was given a hint as significantly more competent than the student who had the puzzle done for them; however, these differences were significantly larger in the contrast condition. The only comparison that was not significant across conditions was that between the student who was allowed to do the puzzle on their own and the student who was given a hint; the difference in perceived competence between these two students was similar regardless of condition. Taken together, these results suggest that contrasting information about how different students were helped may lead to more pronounced differences in their perceived competence, particularly when one student is provided with an intrusive level of help.

***Did perceptions of the mindset being conveyed by the teacher vary by condition?***

Our last set of analyses examined participants' perceptions of whether the teacher was conveying more of a fixed or growth mindset - i.e., whether they thought that the teacher was conveying that only some or all students can get good at puzzles. We compared these perceptions across the four different scenarios involved in the study, in which participants saw a teacher: 1) allow one student to do a puzzle on their own, 2) give one student a hint, 3) do a puzzle for one student, or 4) provide these contrasting amounts of help to three different students.

A linear model revealed that the scenario a participant saw predicted their perceptions of the teacher's mindset about students' abilities,  $F(3, 151) = 49.28, p < .001$ ,  $R^2_{\text{adj}} = 0.48$  (see Figure 19 below). We had specifically predicted that participants would

think the teacher was conveying more of a fixed mindset in cases when the teacher stepped in and did a puzzle for a student. Pairwise comparisons revealed that this was in fact the case. Compared to those who did *not* see the teacher do a puzzle for a student, those who did thought the teacher was conveying more of a fixed mindset around students' puzzle abilities (contrast condition:  $M = 1.68$ ,  $SD = 0.74$ ; individual condition where teacher did the puzzle for the student:  $M = 2.03$ ,  $SD = 0.82$ ; all  $ps < .001$ ).

Perceptions of the teacher's mindset did not differ between conditions where the participant saw the teacher engage in this intrusive level of help (individual condition where the student was allowed to do the puzzle on their own:  $M = 3.60$ ,  $SD = 0.97$ ; individual condition where the student was given a hint:  $M = 3.49$ ,  $SD = 0.97$ ;  $p = .286$ ), suggesting that simply seeing a teacher overhelp a student was enough for participants to report that this teacher was conveying more of a fixed mindset.

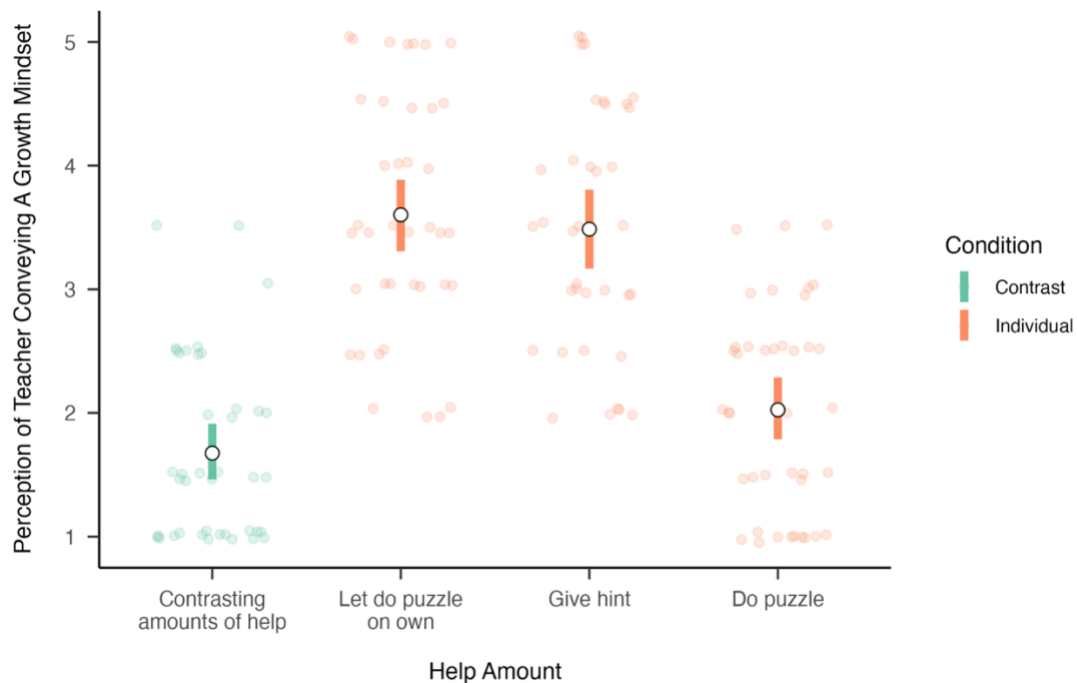


Figure 19. Participants' perceptions of how much the teacher seemed to be conveying a growth mindset about students' abilities, plotted by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

## Discussion

This study provides a few initial answers to the key question that motivated this chapter: what kinds of messages do adults think that different amounts of help, including intrusive help, might convey about students' abilities? We found that when a teacher engages in an intrusive level of help - specifically, doing a puzzle for a student - participants tend to think this student is less competent. This is true regardless of whether there is information available about how other students were helped. Notably, the availability of this information *did* influence participants' ratings of students who received less help - namely, those who were allowed to do the puzzle on their own or

were given a hint. These students were rated as more competent when it was clear that other students had received more relatively more help (and that one was even overhelped). Thus, it seems that adults interpret a student receiving intrusive help as a cue that the student is not very competent. Moreover, differences in the perceived competence of those who are intrusively helped and those who are not may become even more pronounced when there was a clear contrast in the amount of help a teacher gave their students on the same task.

It is possible that participants showed more pronounced differences in their perceptions of students' competence in the contrast condition, compared to the individual conditions, because they attributed the teacher's help to different factors. That is, in the contrast condition, participants might have been more likely to attribute the teacher's actions to differences in the students' competence, since it was clear that the teacher adjusted their help for different students (and did not simply provide the same amount of help to everyone). In the individual conditions, participants might have also assumed that the teacher's help signaled something about the student's competence. However, since participants only saw the teacher help one student, they could have also produced an alternative explanation: that is, participants could have assumed that the teacher's help reflected something about the *teacher* (e.g., that the teacher simply always provides that type of help). The availability of this other explanation in the individual conditions could explain why the amount of help the teacher provided was especially strong in shaping participants' perceptions of students in the contrast condition. Although, notably, the student who the teacher did the puzzle for was rated as similarly incompetent in both the contrast and individual conditions, suggesting that intrusive help might be an especially

strong signal that a student is not competent, even when it is unclear how a teacher helped other students.

This is not to say, however, that participants who saw a teacher provide intrusive help did not draw conclusions about the teacher. As we initially predicted, participants who saw scenarios in which a teacher stepped in and did a puzzle for a student thought that this teacher was conveying a more fixed view of students' abilities - that is, that only some (rather than all) students can get good at puzzles. Participants thought the teacher was conveying this fixed mindset regardless of whether they just saw the teacher provide their one student with intrusive help or also saw the teacher provide their other students with less help. In the other scenarios, where a student was either allowed to do a puzzle on their own or was given a hint, participants did not think the teacher was conveying a fixed mindset. This suggests that a teacher who provides even just one student with intrusive help might be conveying not just that that specific student is less competent, but also that students' abilities in general are not malleable.

Taken together, these findings provide initial evidence that, when a teacher provides a student with intrusive help, they may (even inadvertently) be conveying negative messages about ability. In Study 6, we delve deeper into the role that contrasting amounts of help might play, particularly in shaping individuals' perceptions of students' competence. We specifically explore whether a more minimal contrast in the amounts of help a teacher offers their students – i.e., a contrast that does not involve intrusive help – might also convey negative messages about students' abilities.

## Study 6

In Study 6 (pre-registered: <https://osf.io/ytzdr>), we further explored how seeing a teacher provide different students with different amounts of help might convey negative messages about some students' abilities. Previously, we found that participants perceived students who received more help as being less competent, especially when it was clear that other students had received less help. However, participants who were presented with this contrast always saw one student receive an intrusive amount of help – i.e., the teacher did a puzzle for them. It is unclear whether a more minimal contrast – for instance, seeing the teacher allow one student to do a puzzle on their own and give another student a hint – would similarly convey a “hierarchy” of ability, above and beyond what participants infer when they do not have information about how other students were helped.

In the present study, we explored the role of contrast specifically, with the goal of shedding light on exactly how contrasts in help (that do not involve intrusive help) might independently contribute to perceptions of students' abilities. To do this, we used a design similar to that of Study 5. However, instead of presenting participants in the contrast condition with information about how a teacher helped three of their students, we presented them with a more minimal contrast. In this new contrast condition, participants saw a teacher interact with two of their students; the teacher allowed to do their puzzle on their own and gave the other student a hint. We reasoned that, by simply removing the third interaction where the teacher intervenes and does a puzzle for a third student, we would be able to isolate the role of contrast and see whether participants would still perceive the teacher as conveying more of a fixed mindset when this contrast did not involve any student being given an intrusive level of help.

Participants in this study were assigned to either a contrast condition (described above) or one of two individual conditions. Participants in the individual conditions were shown a teacher and one of their students; the teacher either allowed their student to do the puzzle on their own or gave their student a hint. These conditions not only provided comparison cases for evaluating the role of contrast, but they also allowed us to replicate the corresponding individual conditions from Study 5.

In line with our previous pilot data and our findings from Study 5, we predicted that, within the two individual conditions and the updated contrast condition, participants' ratings of the students' competence would be related to the amount of help they were offered by the teacher. That is, when asked how competent *the teacher* thinks each student is, we expected that participants would rate the student who was allowed to do the puzzle on their own as more competent than the student who was given a hint.

We also predicted that there would be a significant interaction between condition (contrast vs. individual) and the amount of help offered. Specifically, we expected that participants would rate the student who was allowed to do the puzzle on their own as more competent in the contrast condition than in the corresponding individual condition. In contrast, we expected that the student who was given a hint would be rated as more competent in the individual condition (since, in the contrast condition, it would be clear that another student received less help).

In addition to expecting differences in competence ratings across the contrast and individual conditions, we also predicted that participants would differ by condition in terms of their perceptions of what the teacher seems to be conveying about students' abilities. Specifically, we expected that participants would perceive the teacher as

conveying more of a fixed mindset around students' puzzle abilities in the contrast condition (where they saw the teacher provide two students with contrasting amounts of help) than in the individual conditions (where they saw the teacher either allow a student to do a puzzle on their own or give a student a hint). We did not expect to see as large of a difference as we saw in Study 5, since the teacher did not provide a student with intrusive help (which likely contributed to participants' fixed mindset perceptions in the contrast condition of Study 5). However, we thought that even a more minimal contrast in help might still subtly convey, at least to a larger extent than in the individual conditions, that only some (and not all) students can get good at puzzles.

## **Methods**

### ***Participants.***

Participants were 120 adults (ages 18+) recruited from Amazon Mechanical Turk (MTurk) via the CloudResearch platform. Any respondent who failed a bot check (which involved identifying the object in an image) in the beginning of the survey was excluded from participating. All participants provided their consent electronically prior to their participation.

The final sample ( $N = 120$ ) was 68% White, 48% female, and 58% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

The procedure was very similar to that of Study 5. Participants were randomly assigned to one of two individual conditions or to the contrast condition. In the individual

conditions, participants saw a teacher interact with one of their students and either allow them to do the puzzle on their own ( $n = 40$ ) or give them a hint ( $n = 39$ ). In the contrast condition ( $n = 41$ ), participants saw a teacher interact with two of their students; the teacher allowed one of these students to do the puzzle on their own and gave the other student a hint.

After being presented with information about how a teacher helped their student(s), participants were asked to rate the competence of the student(s). Those in the individual conditions only rated the competence of one student, since they were told about a teacher and only one of their students. In the contrast condition, participants were asked to provide two competence ratings, one for each of the students they were shown. (Note that, as in Study 5, participants rated how competent *the teacher* thought each student was.)

After providing competence ratings, participants in all conditions were then asked about their perceptions of the teacher's mindset (i.e., whether they thought the teacher was conveying that only some or all students can get good at puzzles). Following this, participants filled out a scale that assessed their own mindset. We conducted exploratory analyses involving participants' own mindset scores but did not find that they influenced any of our results, so we do not report those analyses here.

At the end of the survey, participants filled out basic demographic questions. They were then debriefed and thanked for their time.

### ***Analysis Strategy.***

As in Study 5, participants in our contrast condition made multiple (i.e., two) competence ratings, while participants in our individual conditions only made one.

Findings from Study 5 as well as our previous pilot work suggested that we could treat the repeated measures in the contrast condition as independent observations (and thus straightforwardly compare data from the contrast and individual conditions). To confirm that this was in fact the case, we planned to use the same checks used in our earlier work. This involved running a linear mixed effects model examining the effect of the amount of help on participants' competence ratings for *only* the contrast condition. This model included a random effect of participant. As in Study 5, we checked whether the estimate of the random effect variance was zero (and the model fit was singular, as indicated by a TRUE value returned by the `isSingular` function in R). After conducting these checks, we moved forward with our subsequent analyses, which treated the data from the contrast condition as independent observations.

Within the contrast and individual conditions, we ran linear models to examine whether participants rated the student who received a hint as less competent than the student who was allowed to do the puzzle on their own. We then examined the data from both conditions together to see whether there was an interaction between condition (contrast vs. individual) and the amount of help provided. For this analysis, we constructed a linear model with condition, amount of help, and their interaction entered as predictors. We then used the `emmeans` package to examine whether each student was rated as more competent in the contrast condition or in the individual condition.

We next used a linear model to examine whether participants' perceptions of the teacher's mindset varied across the contrast condition and the two individual conditions (where each of the two amounts of help is considered in isolation). As in our prior

analyses, we used eemmeans to conduct pairwise comparisons between the three conditions being considered.

As in Study 5, we conducted checks to ensure the robustness of our findings. Specifically, we checked to see whether either 1) the sequence in which participants in the contrast condition saw the teacher give both forms of help or 2) excluding or including responses from participants who responded “not sure/don’t know” on the teacher mindset items influenced our findings.

## **Results**

### ***Robustness checks.***

Initial analyses indicated that the order in which participants saw the teacher offer different amounts of help in the contrast condition did not interact with help amount in predicting competence or mindset perceptions (all  $ps > .05$ ). Thus, we did not include order as a predictor in our subsequent analyses.

We also checked to see whether excluding participants who answered “not sure/don’t know” on our mindset perception items would influence our findings on other measures. We found that 6 participants total provided this answer (2 per condition); all of them gave this response on the item that asked, “To what extent did the teacher’s actions convey that all students can get good at puzzles?” We found that excluding these participants did not change any of our findings on participants’ competence ratings, so we moved forward with our plan to include them in these analyses.

### ***Examining random effect variance in contrast condition.***

As in Study 5 (and per our preregistered analysis plan), we examined whether the three competence ratings made by participants in the contrast condition could be treated as independent observations. We fit the data from the contrast condition to a linear mixed effects model with a random effect of subject. A summary of this model revealed that, unexpectedly, the random effect variance was non-zero. We also checked the model using the “isSingular” function, which confirmed that there was not a singular model fit. These results ran counter to our expectation that we would find zero random effect variance and a singular model fit, as we did in Study 5. To account for the non-zero random effects variance, we moved forward by running our analyses within the contrast condition using a linear mixed-effects model rather than a simple linear model.

Importantly, our findings within the contrast condition did not differ depending on whether we ran a linear mixed-effects model (effect of help amount on competence rating:  $B = 2.12$ ,  $SE = 0.18$ ,  $t(1) = 12.11$ ,  $p < .001$ ,  $R^2_{\text{marginal}} = 0.58$ ) or a simple linear model (effect of help amount on competence rating:  $B = 2.12$ ,  $SE = 0.20$ ,  $t(1) = 10.56$ ,  $p < .001$ ,  $R^2_{\text{adj}} = 0.58$ ). Because we wanted to be able to straightforwardly examine a potential interaction between the contrast and individual conditions (as we did in Study 5), we opted to still use simple linear models (in line with our pre-registration) for analyses that included data from both conditions.

***Were those who received more help rated as less competent?***

We first examined whether participants in the contrast condition rated the student who received more help (i.e., the student who was given a hint) as being less competent than the student who received less help (i.e., the student who was allowed to do the puzzle on their own). A linear mixed-effects model revealed that this was in fact the case

( $B = 2.12$ ,  $SE = 0.18$ ,  $t(1) = 12.11$ ,  $p < .001$ ,  $R^2_{\text{marginal}} = 0.58$ ; see Figure 20 below). Thus, even when presented with a more minimal contrast in the amount of help a teacher provided their different students, participants still rated the student who was offered a hint ( $M = 2.22$ ,  $SD = 1.01$ ) as less competent than the student who was allowed to do the puzzle on their own ( $M = 4.34$ ,  $SD = 0.79$ ).

We then examined whether we would see a similar relationship in the individual conditions between the amount of help a student was offered and their perceived competence. A linear model revealed that those in the individual conditions indeed rated the student who was given a hint as less competent than the student who was allowed to do the puzzle on their own ( $B = 1.76$ ,  $SE = 0.19$ ,  $F(1) = 88.99$ ,  $p < .001$ ,  $R^2_{\text{adj}} = 0.53$ ; see Figure 20 below). This was consistent with what we found in Study 5: participants who saw a teacher give help to just one of their students rated the student as more competent when they were allowed to do the puzzle on their own ( $M = 2.41$ ,  $SD = 0.99$ ) than when they were given a hint ( $M = 4.18$ ,  $SD = 0.64$ ).

### *How did contrasts in help influence ratings of the students' competence?*

As in Study 5, we also combined the data from both conditions to see whether there was an interaction between condition (contrast vs. individual) and the amount of help provided by the teacher. Surprisingly, there was not an interaction, as revealed by a linear model ( $B = -0.36$ ,  $SE = 0.28$ ,  $F(1) = 1.69$ ,  $p = .196$ ,  $R^2_{\text{adj}}$  (all predictors) = 0.55). While participants in both conditions rated student who was allowed to do the puzzle on their own as more competent than the student who was given a hint, the perceived competence of both students looked similar across conditions (see Figure 20 below). This finding stands in contrast to what we found in Study 5, where both of these students were

rated as more competent in the contrast condition than in the individual condition. It seems that when the contrast in help is more minimal (i.e., does not involve an intrusive level of help), the availability of information about how other students was helped does not seem to affect students' perceived competence.



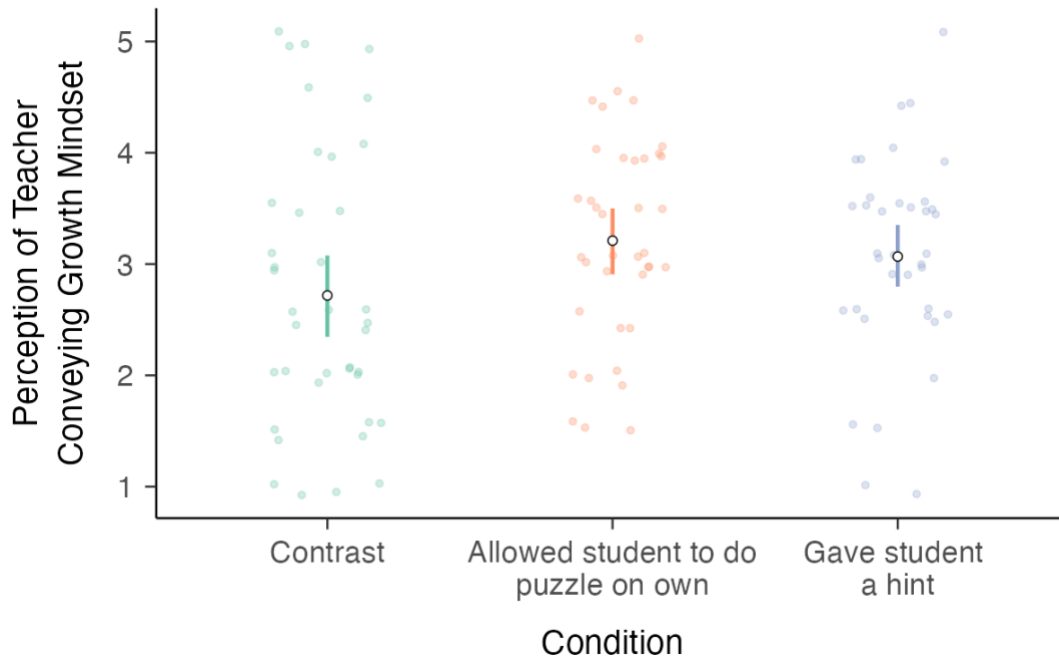
Figure 20. Participants' competence ratings for each student by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

***Did perceptions of the mindset being conveyed by the teacher vary by condition?***

In our last set of analyses, we examined participants' perceptions of whether the teacher was conveying more of a fixed or growth mindset - i.e., whether they thought that the teacher was conveying that only some or all students can get good at puzzles. As in Study 5, we compared these perceptions across different scenarios involved in the study; here, there were three scenarios, in which participants saw a teacher: 1) allow one student

to do a puzzle on their own, 2) give one student a hint, or 3) provide these contrasting amounts of help to two different students.

A linear model revealed an unexpected result: the scenario a participant saw did *not* predict their perceptions of the teacher's mindset about students' abilities,  $F(2, 111) = 2.31, p = .105, R^2_{\text{adj}} = 0.02$  (see Figure 21 below). This contrasts with what we found in Study 5, where we saw that the scenario participants saw did matter. Specifically, in Study 5, participants who saw a teacher give a student intrusive help (i.e., step in and do a puzzle for their student) or who saw a teacher give three students contrasting amounts of help (including an intrusive level of help) perceived that teacher as conveying more of a fixed mindset about students' abilities. However, in the present study, participants' perceptions of the teacher's mindset all hovered around the midpoint of the scale (see Figure 21 below), suggesting that they did not feel the teacher was strongly conveying a fixed or growth mindset. This was true even in the contrast condition ( $M = 2.72, SD = 1.23$ ; individual conditions - given hint:  $M = 3.07, SD = 0.91$ , allowed to do puzzle on own:  $M = 3.21, SD = 0.92$ ). Thus, it seems that a teacher simply providing contrasting amounts of help to different students is not enough to strongly convey that only some students can get good at puzzles; rather, it is when this contrast involves an intrusive level of help that participants seem to think that the teacher is conveying a fixed mindset.



*Figure 21.* Participants' perceptions of how much the teacher seemed to be conveying a growth mindset about students' abilities, plotted by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

## Discussion

Our findings in this study provide key insight into what might have been driving the results in Study 5. Recall that, in Study 5, those in the contrast condition saw a teacher provide their three students with different amounts of help. The teacher 1) allowed one student to do the puzzle on their own, 2) gave another student a hint, and 3) did the puzzle for another student. We found that, while all participants rated students who received more help as less competent, this effect was especially strong among those who saw an explicit contrast in help (relative to those who saw a teacher provide one of these three amounts of help to a single student). We also found that participants who saw the teacher provide intrusive help tended to perceive that teacher as conveying a fixed mindset about students' abilities.

In Study 6, we examined a more minimal contrast in help. Participants in the new contrast condition saw a teacher allow one student to do a puzzle on their own and give another student a hint. Within both this contrast condition and the corresponding individual conditions, participants thought that students who received more help were less competent; however, this time, the effect looked similar across conditions. Moreover, we found that participants who saw a more minimal contrast did not think the teacher was conveying more of a fixed mindset. In fact, their perceptions of the teacher's mindset were not significantly different from those who did not see a contrast in help.

These findings suggest that those who saw a more minimal contrast in help did not perceive students' competence differently from those who only saw the amount of help one student received. Taken together with our findings from Study 5, it seems that, when a contrast is more minimal and does not involve intrusive help, the contrast itself does not influence competence perceptions. However, when a contrast does involve intrusive help, as it did in Study 5, it seems that students who receive less help are rated as more competent than they would be if they had been considered in isolation (as they were in the individual conditions). Thus, it may be the case that seeing a student receive intrusive help is the *key* contrasting information that shifted participants' perceptions of the other students' competence.

Additionally, participants who saw a minimal contrast in this study did not think the teacher was conveying more of a fixed mindset than participants who did not see a contrast. This provides even more evidence that the negative messages that were conveyed in the contrast condition in Study 5 probably arose due to the fact that participants saw a more *extreme* contrast. Indeed, the contrast in Study 5 involved a

teacher doing the puzzle for one of their three students; this highly intrusive help is likely what drove participants to perceive this teacher as conveying more of a fixed mindset (i.e., that only some students can get good at puzzles).

Our findings thus far seem to suggest that when adults see a teacher provide intrusive help, they might think that teacher is conveying more of a fixed mindset. There may be cases, however, when a teacher needs to provide a student with a lot of help. For example, a student who is first learning how to do a new type of puzzle might need to be shown how it works before they can attempt it on their own. In a situation like this, a teacher might want to provide a lot of help - they might step in and provide a demonstration or do the first puzzle so that the student can learn how they are done. However, our results suggest that, even if well-intentioned, providing the student with these types of help might inadvertently imply a negative message – i.e., that teacher does not think this student is competent, and or that the teacher believes that only some students can ever get good at puzzles. How can teachers avoid conveying these types of messages when they need to provide a student with a lot of help? We explore this question in Study 7.

### Study 7

In Study 7, we explored how a teacher's explicit framing of their help (particularly help that could be construed as intrusive) might influence how this help is interpreted. Recent work in the mindset literature suggests that a teacher's explicit messages around success and struggle can help to signal their beliefs about whether ability is malleable or fixed (Kroeper et al., 2022). However, this past research does not directly manipulate teachers' messages, nor does it tell us how such messages might interact with their actual practices, such as the help they offer their students. We address these questions in the present study, focusing specifically on how the explicit messages teachers provide alongside help might influence the messages this help seems to convey (to adult observers) about students' abilities.

All participants in the present study saw a scenario that was similar to the one used in the contrast condition of Study 5. That is, they saw a teacher 1) allow one student to do a puzzle on their own, 2) give another student a hint, and 3) do the puzzle for another student. Critically, what we manipulated in the current study was the explicit framing that the teacher provided. We used two types of framing: one was a general acknowledgment of the fact that students might have different levels of experience with puzzles, and the other was a rationale for the help directed specifically toward the student for whom the teacher did the puzzle ("Here, let me do the puzzle for you to show you how").

Participants were assigned to one of four conditions, so they saw one framing, both framings, or neither framing. As in Studies 5 and 6, we asked participants about their perceptions of each student's competence as well as their perceptions of the mindset

being conveyed by the teacher. While we did not have specific directional hypotheses about how these different framings would affect participants' perceptions, we thought that both of these framings might be effective at conveying more of a growth mindset. Both types of framing provide some context that helps to explain why the teacher provided so much help to one student. However, we suspected that the specific rationale might be especially effective at buffering against the perception that the teacher is conveying a fixed mindset, since the rationale clarifies that the teacher's intent is to teach the child.

## **Methods**

### ***Participants.***

Participants were 60 adults (ages 18+) recruited from Amazon Mechanical Turk (MTurk) via the CloudResearch platform. Any respondent who failed a bot check (which involved identifying the object in an image) in the beginning of the survey was excluded from participating. All participants provided their consent electronically prior to their participation.

The final sample ( $N = 60$ ) was 82% White, 35% female, and 54% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

The procedure in Study 7 was quite similar to that of Studies 5 and 6. Participants were directed to a Qualtrics survey, where they were randomly assigned to one of four conditions. Across all conditions, participants saw a version of the same scenario used in

the contrast condition of Study 5. What varied across the four conditions in the present study was the explicit framing provided by the teacher.

In the “general acknowledgment” condition, participants ( $n = 15$ ) saw the teacher make a statement to the three students before offering any of them help. Specifically, the teacher said, “I know that some of you have done puzzles a lot before and some of you have not done puzzles a lot before.” Participants then saw the teacher 1) allow one student to do a puzzle on their own, 2) give another student a hint, and 3) do the puzzle for another student (as in the contrast condition of Study 5).

In the “specific rationale” condition, participants ( $n = 15$ ) saw the teacher give each student a different amount of help. However, instead of seeing the teacher give a general statement to all students, participants in this condition saw the teacher provide a specific rationale for their actions when interacting with the student for whom they did the puzzle. Specifically, the teacher said to this student, “Here, let me do the puzzle for you to show you how.”

Participants in our other two conditions either saw both of these framings (the “both framings” condition,  $n = 15$ ) or neither framing (the “neither framing” condition,  $n = 15$ ). Those in “neither framing” condition saw exactly the same scenario as participants in the contrast condition of Study 5. It should be noted that, in all conditions, participants saw the teacher provide different amounts of help in the same order - i.e., they always allowed the first student to do the puzzle on their own, gave the second student a hint, and did the puzzle for the third student. We did not counterbalance the order of these events because our results from Studies 5 and 6 suggested that order did not influence

participants' ratings. Thus, we kept the order consistent across conditions in the present study.

After seeing a scenario in which the teacher provided one, both, or neither framing, participants across all conditions were asked to rate how competent the teacher thought each student was. Next, participants were asked about their perceptions of whether the teacher was conveying more of a fixed or growth mindset about puzzle ability. (Both the competence and mindset perception measures were identical to those used in Studies 5 and 6.)

Following these primary measures, we also asked participants a few exploratory questions, such as how much they liked the teacher and how helpful they thought they were. Since these questions do not relate to our key predictions in this study, we report the results of these exploratory items in the appendices.

At the end of the survey, participants filled out basic demographic questions. They were then debriefed and thanked for their time.

### *Analysis Strategy.*

As in Studies 5 and 6, participants made multiple competence ratings, one for each of the three students presented in the scenario. Since all conditions in this study involved repeated measures for the competence ratings, we decided to use linear mixed effects models (with a random intercept of participant) when examining participants' ratings of the students' competence. Our critical model examined whether there were differences across the framing conditions in how teachers' help influenced competence perceptions. We tested this by fitting a model containing help amount, framing condition, and their interaction as predictors.

We also explored whether the presence of one or both types of framing influenced participants' perceptions of the mindset being conveyed by the teacher. To do this, we fit a linear model (since each participant only provided these ratings once) with both of the predictor variables described above as well as their interaction. As in our previous studies, we employed the emmeans package to follow up on any significant interactions and conduct pairwise comparisons.

Note that no participants answered “not sure/don’t know” on either of our mindset perception items in this study; thus, we did not need to conduct any analyses (as we did in our prior studies) examining whether including or excluding participants who provided this response would influence any of our findings.

## Results

### *Did the teacher’s framing of their help influence competence ratings?*

We first examined how seeing one, both, or neither of the two framings - 1) a general acknowledgment that some students may have had more experience with puzzles than others and/or 2) a specific rationale for doing the puzzle for one student - might influence participants' ratings of the students' competence. A linear mixed effects model both revealed that students who received more help were rated as less competent ( $p < .001$ ,  $R^2_{\text{marginal}} = 0.75$ ). This effect was the same regardless of condition (i.e., whether the teacher provided one or both types of framing,  $p = .774$ ,  $R^2_{\text{marginal}} = 0.75$ ; see Figure 22 below). Thus, regardless of the framing provided by the teacher, participants still rated students who received more help as less competent.<sup>3</sup>

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<sup>3</sup> This may be because the teacher’s specific rationale implied that the student did not in fact know how to do the puzzle.

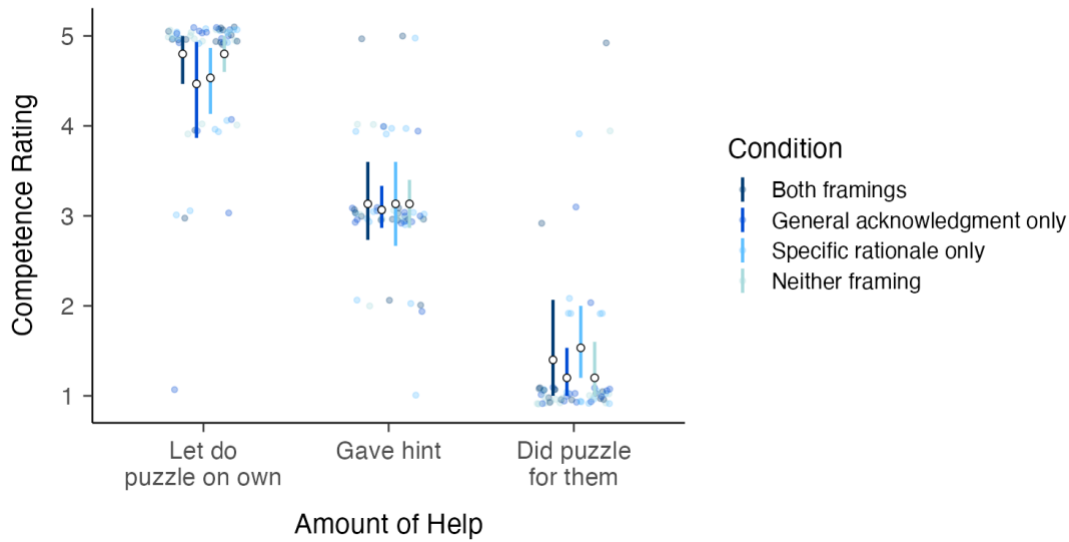


Figure 22. Participants' perceptions of each student's competence, plotted by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

### ***Does framing convey more of a growth mindset about students' abilities?***

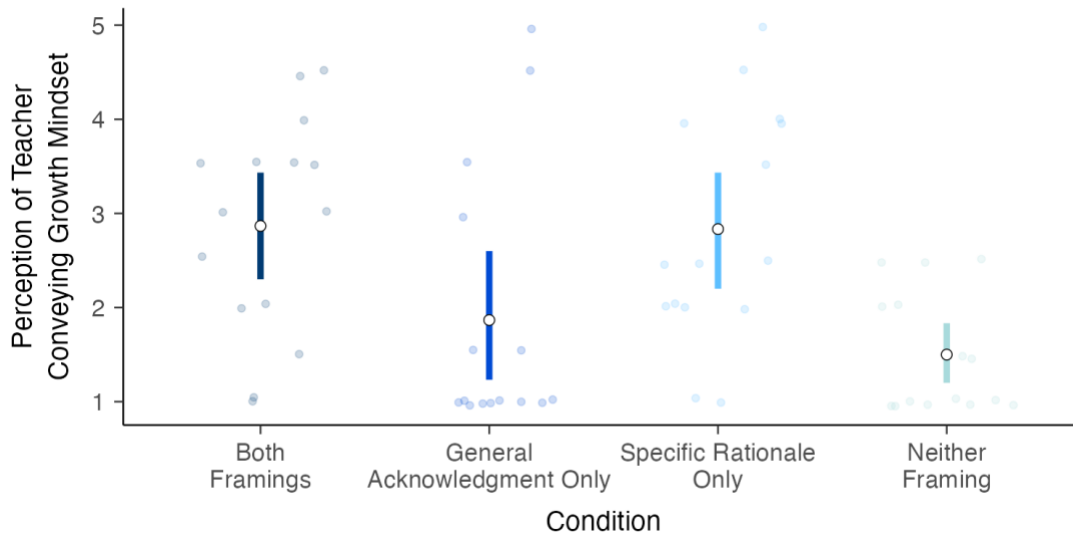
Next, we examined how the teacher's explicit framing of their help might influence participants' perceptions of whether the teacher is conveying more of a fixed or growth mindset around puzzle ability. A linear model revealed that this was in fact the case,  $F(3, 56) = 5.42, p = .002, R^2_{\text{adj}} = 0.18$  (see Figure 23 below).

Pairwise comparisons examining the differences between each possible pair of conditions revealed an interesting pattern of results. Those in the condition containing both framings ( $M = 2.87, SD = 1.13$ ) as well as the condition where the teacher *only* provided a specific rationale ( $M = 2.83, SD = 1.22$ ) thought the teacher was conveying more of a growth mindset than those in the condition with neither framing ( $M = 1.50, SD = 0.61; p = .010$  and  $p = .013$ , respectively). Thus, it seems that framing does shift perceptions of which mindset is being conveyed by the teacher. Even the specific

rationale alone seemed to convey a more positive message about students' puzzle abilities.

The general framing, however, did not seem to make a difference on its own. Those who saw the teacher *only* provide a general acknowledgment about students having varying levels of past experience with puzzles ( $M = 1.86$ ,  $SD = 1.38$ ) showed no difference in their perception of the teacher's mindset relative to those who saw neither framing ( $p = .818$ ). Additionally, there was no difference between the conditions where participants saw both framings or just the specific rationale ( $p = .999$ ). These results suggest that the general framing may not have substantially contributed to the perception that the teacher was conveying more of a growth mindset.

Indeed, there were a few other results that, while marginal, also hinted at the specific rationale being more effective than the general acknowledgment at conveying a growth mindset about students' abilities. Participants who saw both framings or only saw the teacher provide a specific rationale showed a trend towards thinking that the teacher was conveying more of a growth mindset than those who saw just the general acknowledgment ( $p = .092$  and  $p = .109$ , respectively). Taken together with the above findings, these results suggest that the specific rationale may be especially effective at conveying that students' abilities are more malleable.



*Figure 23.* Participants' perceptions of how much the teacher seemed to be conveying a growth mindset about students' abilities, plotted by condition. Points represent individual data, and bars represent 95% bootstrap CIs.

## Discussion

This study sheds light on how a teacher's explicit framing of their help can shape the messages this help seems to convey. Here, we explored the effects of two types of framing: a general acknowledgment that students have different levels of past experience with puzzles, and a specific rationale that made clear the pedagogical intention behind doing the puzzle for one student. We found that, consistent with our results from Study 5, participants perceived a teacher who provided no framing when giving three students different amounts of help (allowing one student to do the puzzle on their own, giving one student a hint, and doing the puzzle for another student) as conveying more of a fixed mindset. However, when the teacher provided both framings or even just a specific rationale, participants thought the mindset they were conveying was significantly more growth-oriented. Taken together, these results suggest that providing a specific rationale

that highlights a pedagogical intention can help prevent a large amount of help from being seen as indicative of a fixed mindset.

It is worth noting that even though framing influenced participants' mindset perceptions, none of the framings shifted these perceptions squarely from a fixed mindset to a growth mindset. When the teacher provided no framing, participants thought that the teacher was strongly conveying a fixed mindset about students' puzzle abilities. When both framings or a specific rationale were provided, participants thought the teacher was conveying *less* of a fixed mindset (or *more* of a growth mindset), but they did not think that they were *strongly* conveying a growth mindset per se. Indeed, seeing both framings or a specific rationale shifted participants more towards the middle of the scale. Thus, it is not the case that providing a large amount of help to a student, such as doing a puzzle for them, is perceived entirely positively when certain framings are provided. However, it seems that these framings can help to buffer against sending strong fixed mindset messages.

It is also important to note that we did not find that either type of framing (or both together) influenced perceptions of the students' competence. This suggests that providing more help may still convey low competence perceptions; however, when a lot of help is accompanied by a specific rationale like the one used in this study, it may be less likely to convey that the student cannot get better in the future.

The present study joins Studies 5 and 6 in providing insight into how teachers' help can send messages about students' abilities. In the next chapter, we explore how *parents'* help might similarly send messages about the abilities of children (and whether those abilities can change).

#### **Chapter 4: Do parents recognize that intrusive help can convey negative messages?**

Chapter 3 revealed that, when a teacher provides help to their students, the amount of help they give might suggest something about that teacher's beliefs about their students' competence. Moreover, teacher's help also seems to convey messages about whether students' abilities are fixed or malleable. The strongest messages seemed to be conveyed when a teacher engaged in intrusive help - i.e., when they insisted upon doing a puzzle on a student's behalf. When a teacher did a puzzle for a student, adult participants thought the teacher perceived this student as quite incompetent at puzzles. Additionally, unless a specific pedagogical intention was given, participants thought the teacher's actions communicated more of a fixed mindset about students' puzzle abilities in general.

In Chapter 4, we probe the messages that *parents'* help might convey. Like teachers, parents are influential in shaping children's achievement-related beliefs and motivation. Given that even a single instance of intrusive help from a teacher seems to communicate strong messages about ability, it is important to examine whether this help conveys similar (or different) messages when it comes from a parent.

Our primary aim in this chapter is to explore not only whether intrusive help from parents can convey negative messages about children's abilities, but also whether parents themselves recognize that providing intrusive help might convey such messages. In Chapter 2, we found that some parents endorse highly intrusive practices, and that they are particularly likely to do so if they believe that parents need to solve problems and make decisions for even young-adult children. Is it the case that these parents simply do not recognize that these helping practices can convey negative messages about ability? Or

is it the case that they *do* recognize this possibility but still agree that this type of help is appropriate?

Exploring this question not only can help us better understand what messages adults think intrusive help might send, but also allows us to shed light on what kinds of interventions might be effective in reducing highly intrusive helping practices. If even the parents who tend to endorse intrusive help - i.e., those who believe that parents need to solve problems and make decisions for their children - recognize that intrusive help can send negative messages to children, then simply educating them about this might not be a fruitful strategy for reducing these kinds of helping practices. However, if these parents do *not* recognize (or at least recognize to a lesser extent) that intrusive help can convey low competence perceptions and a fixed mindset, then one potential intervention strategy could involve informing parents of these potential negative consequences.

### Study 8

In Study 8 (pre-registered: <https://osf.io/xg86k>), we explored how adult participants (specifically parents of adolescents) would construe a situation where a parent provides their adolescent child with highly intrusive help. Specifically, we were interested in whether seeing a parent provide intrusive help might shape participants' perceptions of the adolescent's ability as well as the mindset being conveyed by the parent. We also examined whether participants' own beliefs about parenting influenced the extent to which they thought that intrusive help would convey a negative message to the adolescent.

This study consisted of two surveys. In our first survey, parents were asked to fill out a number of scales. The key scale of interest was the parent belief scale we developed

for Studies 1-4, which assessed the extent to which parents believed that parents need to solve problems and make decisions for even young-adult children.

A week later, the same parent participants were invited to participate in our second survey. They were asked to consider a hypothetical scenario involving a parent and their high-school age child. In the scenario, the parent takes over and does a project on their high-schooler's behalf. We asked participants about their perceptions of 1) the mindset being conveyed by the parent, 2) how the high-schooler would feel, and 3) how competent the parent believes their high-schooler is.

The data from these two surveys allowed us to relate parents' beliefs about whether parents need to solve problems and make decisions for young-adult children to their perceptions of the hypothetical scenario. While we expected that parents who showed less endorsement of these beliefs would recognize that intrusive help can convey negative messages about ability, we did not make any specific predictions about the parents who more strongly endorsed these beliefs. As noted above, we thought there were two possibilities: these parents might not think this help conveys as negative of a message, or they might agree that it conveys a negative message (but find it appropriate despite this).

## **Methods**

### ***Participants.***

Participants were parents recruited from the CloudResearch Connect platform. Only parents who resided within the United States and reported having at least one child between the ages of 14 and 18 years were eligible to participate. Any respondent who indicated that they did not have at least one child between the ages of 14-18 or who failed

a bot check (i.e., an invisible “honeypot” question contained in the beginning of each survey) was excluded from participating. All participants provided their consent electronically prior to their participation.

We first recruited 200 parents for our initial screener survey. We invited these same parents to participate in our second survey. Out of the initial 200 who completed the screener, 188 also completed the main survey.

The final sample ( $N = 188$ ) was 67% White, 46% female, and 61% reported having a college degree or more. Additional details about the demographic characteristics of the sample are reported in the appendices.

### ***Procedure.***

Parents in the final sample completed two surveys. In the first survey, parents were presented with a number of scales in a fixed order. Our key scale of interest was the parent belief scale that we developed and used in Studies 1-4; this was the first scale that parents saw and completed. We included additional scales afterwards in order to obscure the purpose of the study. The additional scales we included were: the Big Five Inventory-10 (Rammstedt & John, 2007), the Parental Overvaluation Scale (Brummelman et al., 2015), My Child Versus Other Children Scale (Brummelman et al., 2015), and an abridged version of the Just World Scale (Lucas, Zhdanova, Alexander, 2011). At the end of the survey, we asked parents some basic demographic questions.

A week after parents completed the first survey, we sent them an invitation (via email) to participate in our second survey. In the second survey, parents were presented with a scenario involving a hypothetical parent and their adolescent (ages 14-18, approximately high-school age) child. This scenario was a modified version of one of the

scenarios used in Studies 1-4. The scenario read: “A high-schooler has a project due 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. Imagine that the high-schooler’s parent sits down and works on the project (with some input from their high-schooler) until the parent is confident that their high-schooler will get an excellent grade.”

After reading the scenario, parents were presented with our key measures. These measures assessed parents’ perceptions of the parent and the high-schooler described in the scenario, including 1) whether the parent in the scenario was conveying that science ability is fixed or malleable, 2) what the high-schooler might be thinking in response to their parent’s help, and 3) how competent the parent thinks their high-schooler is. The order of the first two measures was counterbalanced across participants, so that roughly half of participants were asked first about which mindset they thought parent was conveying about science ability ( $n = 95$ ), and about half were asked first about what they thought the high-schooler was thinking ( $n = 93$ ). All participants were given a reminder about what the scenario said between each of these measures. The competence perception measure always came last.

Once parents had responded to the above measures, they were asked an open-ended question. This question read: “If *you* were the parent in the scenario described, what would you have done?” Since this question was exploratory and not related to our key predictions for the study, we do not discuss it further here.

### ***Mindset Perceptions.***

After reading the aforementioned scenario, parents were asked to “think back to everything that happened during the scenario” and respond to the following: 1) “To what extent do you agree: the parent’s actions conveyed to their high-schooler that *only some people* can get good at science.” and 2) “To what extent do you agree: the parent’s actions conveyed to their high-schooler that *everyone* can get good at science.” Each question contained a Likert scale ranging from 1 (“not at all”) to 5 (“a great deal”), with an additional option at the end (6 - “not sure/don’t know”). These items were similar to the mindset perception items we developed and used in Studies 5-7.

As in Studies 5-7, we chose to exclude data (only from analyses involving these items) from parents who provided a response of “not sure/don’t know” to either or both of the two aforementioned items. This response option was not frequently chosen; only 8 participants out of 188 chose this response for one or both items. We include data from these participants in all of our other analyses (e.g., when examining perceptions of what the high-schooler is thinking).

### ***Perceptions of high-schooler’s perspective.***

After excluding responses from parents who chose “not sure/don’t know,” we created overall mindset perception scores by reverse scoring parents’ ratings on the first of the two aforementioned items and then averaging these with ratings from the second item. This resulted in higher (overall) scores indicating that the participant perceived the parent in the scenario as conveying more of a growth mindset.

Following the hypothetical scenario, parents were also asked about their perceptions of what the high-schooler in the scenario would be thinking after receiving help from their parent. Parents in the study were presented with a number of positive and

negative reactions that the high-schooler might have. Each reaction was prefaced with the statement: “To what extent do you agree the high-schooler is thinking...” The reactions parents considered were as follows:

To what extent do you agree the high-schooler is thinking...

- “I feel like my parent thinks I’m very competent at science.”
- “My parent doesn’t think I’m capable of creating an excellent science project by myself.”
- “This project makes me feel very competent at science.”
- “This project made me feel insecure about my science abilities.”
- “I’m grateful that my parent is taking the time to make sure my science project is excellent.”
- “I wish my parent had let me do more of the project by myself.”
- “I am proud of my science project.”
- “I feel good about how this project turned out.”
- “I don’t feel this was really my science project.”
- “I learned a lot doing this project.”

Each statement was accompanied by a 7-point Likert scale from “strongly disagree” to “strongly agree”). Parents saw and rated each item individually, and the order in which items were presented was randomized across participants.

### ***Competence Judgment.***

After responding to the above two measures, parents were presented with a single-item measure aimed at assessing their perception of how competent the parent in the scenario thinks their child is. Specifically, parents in the study were asked: “How

competent does the parent think their high-schooler is?” Parents responded on a 5-point scale from “not at all competent” to “extremely competent.”

*Analysis Strategy.*

In this study, we were interested in seeing whether parents - particularly those who believe that parents need to solve problems and make decisions for even young adult children - would recognize the negative messages that intrusive help can send about children’s abilities. To explore this question, we ran a series of three linear models, each of which had parents’ score on our belief scale as the key predictor. (Recall that higher scores on the belief scale indicate greater endorsement of the belief that parents need to solve problems and make decisions for young-adult children.) The three models we ran examined whether parents’ scores on the belief scale predicted their 1) perception of the mindset being conveyed by the parent, 2) perceptions of the high-schooler’s perspective, and 3) ratings of how competent the parent in the scenario thinks their child is.

We also conducted a few checks to ensure the robustness of our findings. In our analysis of parents’ perceptions of the mindset being conveyed in the scenario, we excluded responses from participants who responded “not sure/don’t know” at least once. However, we included data from these participants in our other analyses. To ensure that our findings were robust, we also re-ran our key models with these participants excluded, just to ensure that this did not change our results substantively.

We also examined whether the order in which participants saw two of our key measures (the mindset perception measure and the measure assessing their perceptions of the high-schooler’s perspective) mattered for our key findings. Additional exploratory analyses were also run to see whether the order in which participants saw these measures

influenced their responses on just these measures; the results of these analyses are reported in the appendices.

## Results

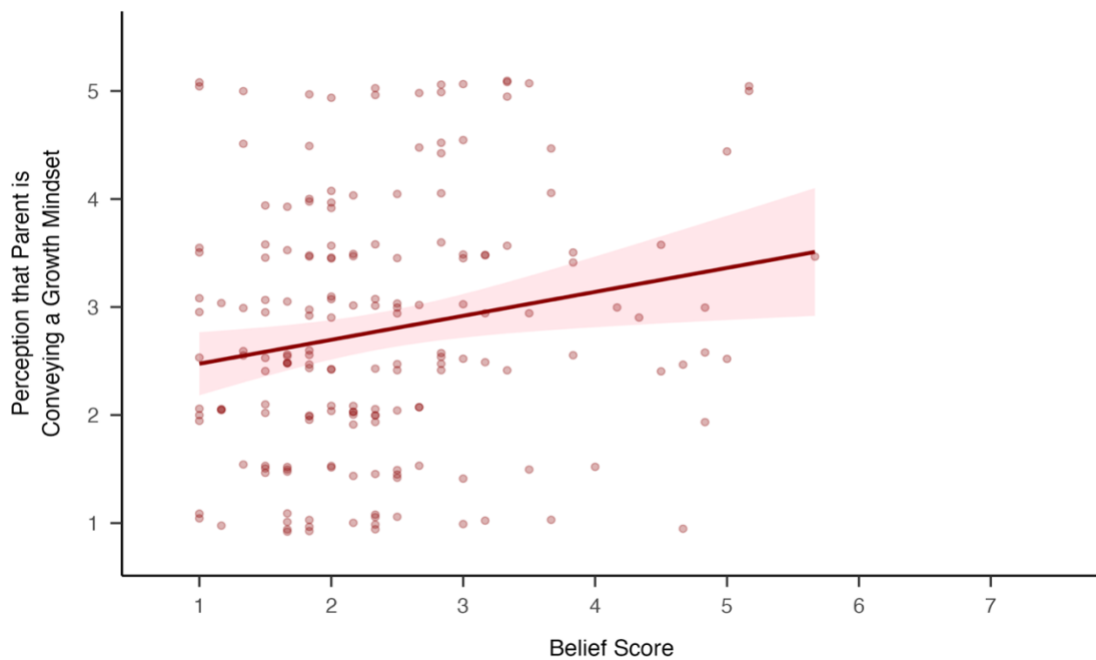
Initial analyses indicated that the order in which parents saw the measures in our study did not interact with parents' scores on our belief scale in predicting any of our key dependent variables (all  $ps > .05$ ). Thus, we did not include order as a predictor in our subsequent analyses. (Although, as noted above, we do explore other order effects in the appendices.)

Additionally, we checked to see whether excluding parents who answered “not sure/don't know” on our mindset perception items would influence our findings. We found that 8 parents total provided this answer to at least one of the two items (3 out of 8 provided this response for both items). As planned, we excluded these parents from our analyses involving the mindset perception items, since we could not easily average their responses to these items. We did not find that including or excluding these 8 parents from our other analyses changed our findings, so we included them when possible.

### *Do parents' belief scores predict their mindset perceptions?*

Our first primary analysis examined whether the extent to parents' belief scores - that is, the extent to which they think that parents need to solve problems and make decisions for young-adult children - predicted whether they thought the parent in the scenario was conveying more of a growth or fixed mindset about science ability. A linear model revealed that parents' belief scores indeed predicted their mindset perceptions,  $B = 0.22$ , 95% CIs = [0.05, 0.39],  $SE = 0.09$ ,  $p = .012$ ,  $r = .187$  (see Figure 24 below). The higher a parent's belief score - i.e., the more they believed that parents need to solve

problems and make decisions for young-adult children - the more they thought the parent in the scenario (who took over and did a science project for their high-schooler) was conveying more of a growth mindset about science ability. This suggests that the parents who are most likely to endorse intrusive help also show more positive perceptions of it in terms of the message they think it conveys about children's science abilities.

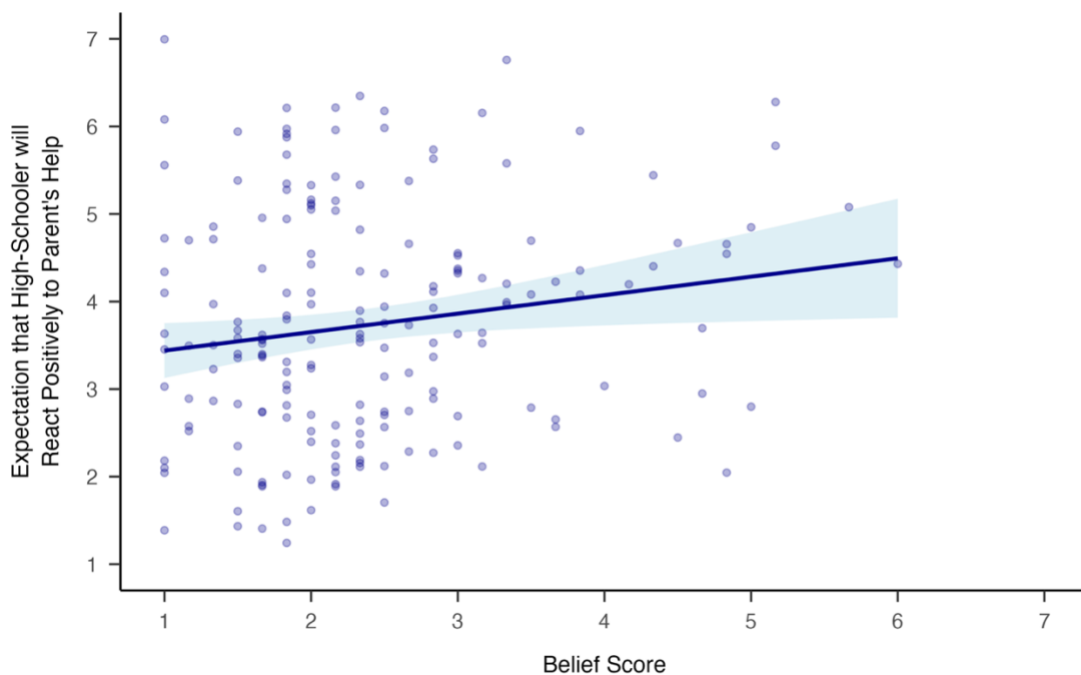


*Figure 24.* Participants' perceptions of how much the parent in the scenario seemed to be conveying a growth mindset, plotted as a function of belief score. Points represent individual data, and the shaded region represents 95% bootstrap CIs.

***Do belief scores predict parents' expectations for what the high-schooler is thinking?***

Next, we examined whether parents' belief scores predicted the extent to which they thought the high-schooler would react positively or negatively to their parent's help. A linear model revealed that parents' belief scores indeed predicted parents' expectations

for what the high-schooler would be thinking in the scenario,  $B = 0.21$ , 95% CIs = [0.03, 0.39],  $SE = 0.09$ ,  $p = .023$ ,  $r = .166$  (see Figure 25 below). The more parents believed that parents need to solve problems and make decisions for young-adult children, the more they thought that the high-schooler would react positively to their parent's help. Thus, the parents who are most likely to endorse intrusive help also seem to believe that it will be more positively received.

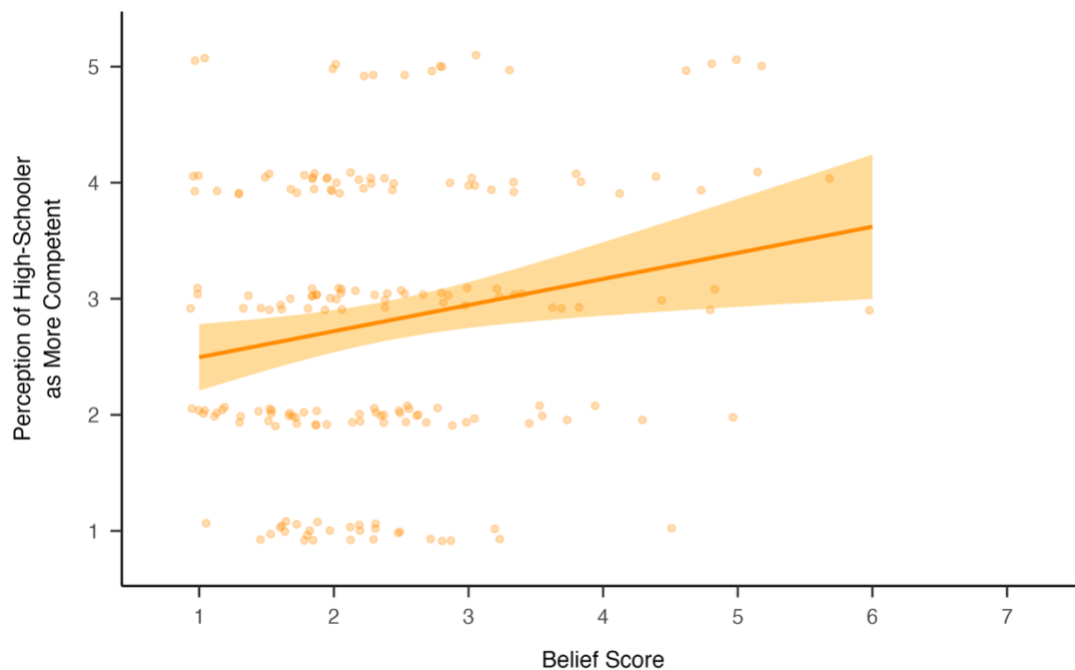


*Figure 25.* Participants' perceptions of how much the parent in the scenario thought the high-schooler would react positively to their parent's (intrusive) help, plotted as a function of belief score. Points represent individual data, and the shaded region represents 95% bootstrap CIs.

### ***Do parents' belief scores predict ratings of high-schooler's competence?***

Finally, we looked at whether parents' belief scores predicted their ratings of how competent the parent in the scenario thought their high-schooler was. A linear model revealed that parents' belief scores predicted their competence ratings,  $B = 0.23$ , 95% CIs

= [0.06, 0.39], SE = 0.08,  $p = .008$ ,  $r = .193$  (see Figure 26 below). The more a parent believed that parents need to solve problems and make decisions for young-adult children, the higher their competence ratings. This suggests that the higher a parent's belief score, the less they thought the parent's help signaled that they did not think the high-schooler was competent.



*Figure 26.* Participants' perceptions of how competent the parent in the scenario thinks their child is, plotted as a function of belief score. Points represent individual data, and the shaded region represents 95% bootstrap CIs.

## Discussion

This study revealed that beliefs about whether parents need to solve problems and make decisions for even young-adult children indeed shape parents' interpretation of intrusive help. In fact, our findings call into question whether some parents view this help as "intrusive" at all. Even when presented with a parent who did a science project for

their high-school age child, parents varied in the extent to which they thought this amount of help would convey low competence perceptions or a fixed mindset about science ability. While most parents did think that this help would convey negative messages, those who strongly believed that parents need to solve problems and make decisions for young-adult children interpreted this help more positively. Indeed, the stronger a parent's belief about needing to solve problems and make decisions for young adults, the more they thought a parent taking over for their high-schooler would convey more of a growth mindset and higher perceptions of the high-schooler's competence. They also thought the high-schooler would react more positively to their parent's help.

Taken together, these findings suggest that there is variation among parents in the extent to which they view an extreme form of help - taking over and doing a task on behalf of one's child - as conveying negative messages about ability. Many parents seem to think that this help is indeed "intrusive"; they think it conveys a fixed mindset and low competence perceptions, and they think it will lead to negative reactions from the help recipient. However, some parents do not think this type of help conveys as negative of a message. These parents tend to be those who believe that parents need to solve problems and make decisions for even young-adult children. Interestingly, our prior work that has shown that parents who endorse this belief also tend to agree more strongly with highly intrusive parenting practices, suggesting that the parents who are most likely to intrude are also least likely to recognize its potential negative impact.

## **Chapter 5: General Discussion**

The present studies shed light on how adults construe intrusive help as well as some of the beliefs that might drive them to engage in it. While prior work has explored how intrusive help can dampen children's motivation in achievement contexts (and why an intrusive approach, particularly among parents, might be on the rise at a broad level within the United States), several important questions remained underexplored at the outset of the current research. We explored a potential psychological driver of intrusive parenting – namely, the belief that parents need to solve problems and make decisions for even young-adult children – and found that it indeed predicted parents' endorsement of highly intrusive practices. We also examined what messages adults think a teacher's help might convey, finding that, when a teacher provides a child with intrusive help, this can convey that the child is less competent and that their abilities are less malleable. Finally, we asked parents about a specific instance of intrusive help and found that those who tended to endorse intrusive help thought it conveyed less of a negative message about children's abilities. Taken together, these findings suggest that most adults think that intrusive help could send maladaptive messages about children's abilities, but some adults (including some parents) show less recognition of these potential negative impacts and might even think intrusive help is necessary for children's learning and long-term success.

In this section, I begin with a summary of my dissertation studies and findings. Next, I address some of the limitations of this work before discussing its implications for the literature as well as for parents, teachers, and students. Throughout, I offer

suggestions for future research that I believe could further expand our understanding of intrusive help and its consequences.

### **Summary**

Studies 1-4 addressed the question of what beliefs might drive parents of adolescents (ages ~14-18 years) to endorse or agree with intrusive practices. Throughout these studies, we specifically explored whether the belief that parents need to solve problems and make decisions for even young-adult children (who are typically quite independent by this developmental stage) would relate to parents' endorsement of highly intrusive parenting practices for a younger age group (i.e., adolescents). In Study 1, we found that this was in fact the case: parents with higher belief scores, who believed to a greater extent that parents need to solve problems and make decisions for young-adult children, were more likely to agree that it was appropriate for another (hypothetical) parent to engage in highly intrusive practices (e.g., doing a science project on behalf of their adolescent child) and were less likely to agree with less intrusive practices (e.g., allowing their adolescent to do the project on their own; although it should be noted that this latter effect was weak and was not consistently replicated across studies). In Study 2, we ran a replication study in 2023 (three years after Study 1 was conducted) and again found that parents with higher belief scores tended to agree more with highly intrusive practices. Additionally, while the majority of parents reported increasing their involvement in their child's schooling during the COVID-19 pandemic, we found that parents with higher belief scores reported the largest increases in involvement. In Study 3, we turned from examining parents' agreement with different practices for another (hypothetical) parent and instead asked them what they themselves would do in

achievement situations involving their adolescent child. We found that parents with higher belief scores tended to opt for highly intrusive practices over less intrusive ones. In Study 4, we went back to presenting parents with hypothetical scenarios (similar to those used in Study 1) and varied the past performance of the adolescent in these scenarios. We found that parents with higher belief scores were less likely to adjust their agreement with highly intrusive practices, regardless of whether the target of those practices (i.e., a hypothetical adolescent) had typically done poorly or well in school.

Studies 5-7 turned from examining parents' help to exploring teachers' help. In Study 5, we presented adults with scenarios involving a teacher and their student(s). We were interested in whether the amount of help the teacher provided – i.e., allowing a student to do a puzzle on their own, giving a student a hint, or doing the puzzle for a student – would influence adults' perceptions of the student's competence as well as their perceptions of whether the teacher seemed to be conveying more of a fixed or growth mindset about students' abilities. This study also explored the role that contrasting amounts of help might play in shaping these perceptions; that is, we wondered whether adults' inferences would be affected by seeing multiple students receive different amounts of help (rather than seeing one student receive one of these types of help). We found that adult participants rated students who received more help as less competent. However, this was especially true when they saw the teacher provide three students with contrasting amounts of help. Participants who saw this contrast or just saw a teacher provide intrusive help (i.e., do a puzzle for a student) also thought this teacher was conveying more of a fixed mindset about students' puzzle abilities. Study 6 explored a more minimal contrast in help – one that did not involve the teacher doing a puzzle for a

student - and found that this less extreme contrast no longer conveyed a fixed mindset or larger differences in perceived competence. Study 7 explored how different framings might buffer against the inference that a teacher who provides a lot of help to a student is conveying a fixed mindset. We found that a specific rationale that conveyed a pedagogical intention (“Here, let me do the puzzle for you to show you how”) was especially effective at reducing the perception that the teacher was conveying a fixed mindset.

Finally, we turned our focus back to parents in Study 8 and examined whether the beliefs we explored in Studies 1-4 (about whether parents need to solve problems and make decisions for young adults) would shape *parents’* perceptions of highly intrusive help. We found that parents with higher belief scores were less likely to think that an instance of intrusive help – taking over and doing a science project for one’s adolescent child – would convey low perceptions of the child’s competence or a fixed mindset around science ability more generally. These parents were also more likely to think that the adolescent recipient of this help would react to the help positively.

Overall, these findings provide us with a fuller picture of how adults construe intrusive help as well as why they might engage in it.

### **Limitations**

Of course, as would be true of any research, the present findings should be considered alongside our studies’ limitations. I discuss some of these key limitations here; while this is by no means an exhaustive list, the intent is to specifically highlight how elements of our design and materials may place limits on the extent to which these findings can be generalized.

First, we ran all of our studies with adult participants, including our studies examining the messages that teachers' help seemed to convey (Studies 5-7). While we did this intentionally so that we could examine how adults construe intrusive help and establish whether even they were sensitive to how different amounts of help might convey different messages about children's abilities, future work should examine children's perceptions of help. Given that children as young as 4 years think that students who are offered help by a teacher are less competent than students who are not (Sierksma & Shutts, 2020), it may be the case that even young children might adjust their perceptions based on the amount of help a student receives.

It is also possible that, even if young children are not as sensitive to more subtle contrasts when considering the help that others receive, they may still show different reactions to receiving these different amounts of help themselves. This highlights yet another limitation of the current work: namely, the fact that many of our studies assessed participants' third-party judgments about hypothetical scenarios and did not examine how participants themselves might feel in response to actually receiving less or more intrusive help. While a third-party paradigm allowed us to gain an initial sense of the kinds of inferences adults might make about these different types of help and what they seem to convey, it is still unclear whether adults (or children) would make similar inferences when placed in these scenarios. That is, would an adult or child actually view themselves as less competent when provided with intrusive help? Moreover, would they infer that person who helped them (e.g., a teacher) believes that their abilities cannot change? Future work should examine these first-person inferences as well as the extent to which they relate to actual motivational consequences (e.g., willingness to seek out challenges).

In addition to using a third-party paradigm, our studies examining teachers' help (Studies 5-7) also used very minimal stimuli. Adult participants were presented with simple drawings of a teacher and their student(s), and the only thing that varied between the images participants saw was 1) the positioning of the teacher (whether they had approached one student or another, etc.) and 2) what the teacher was saying. While we still found striking effects even with these minimal stimuli – particularly in terms of how the amount of help the teacher offered influenced perceptions of the students' competence – it still provided very little information for participants to use in making their judgments about the students' competence or the teacher's beliefs. For instance, participants were not told anything about these students' past performance at puzzles (or in school more generally), nor did they know how the teacher had helped these students previously (which may be important in shaping whether someone thinks a teacher's help is diagnostic of students' competence; Asaba et al., 2018). Future work should explore how adding additional context to teachers' help influences both observers' perceptions as well as help recipients' own beliefs about their competence.

Future research should also examine parents' real-world practices and how these relate to their beliefs. While our work on intrusive parenting did examine parents' choices of practices (in Study 3) and their third-party judgments of what would be appropriate for another parent to do (Studies 1, 2, and 4), we did not explore parents' actual parenting behaviors with their own child. In Study 3, we presented parents of adolescents with hypothetical achievement-related scenarios and asked them what they would do. Parents with higher belief scores (who more strongly believed that parents need to solve problems and make decisions for young-adult children) were more likely to opt for highly

intrusive practices, while parents with lower belief scores were more likely to opt for less intrusive practices. However, it is unclear whether parents' choices in response to hypothetical scenarios map on to their actual practices. Future work should explore how parents' beliefs predict their real-life practices and whether variables like their own child's past performance interact with these beliefs.

Another limitation of the current work is that the practices participants were asked to judge in our studies were pre-determined (by the authors) to be "highly" or "less" intrusive. We chose practices for each of these categories based on past literature on intrusive parenting (Padilla-Walker & Nelson, 2012) and scaffolding (Carr & Pike, 2012). We also intentionally tried to select intrusive practices that were quite extreme (e.g., doing a project for one's child) so that there would be a clear contrast between these practices and the less intrusive, more autonomy supportive ones (e.g., providing the child with materials to do the project but letting them complete the project on their own). However, this does not mean that all parents (or all children) would necessarily agree with our categorizations of practices as highly or less intrusive. Indeed, as we saw in Study 8, there are clear differences among parents in terms of whether they think taking over and doing most of a project for one's child – a practice we considered highly intrusive – conveys negative messages about children's abilities. The extent to which parents and children consider different practices to be highly or less intrusive should be investigated empirically.

Returning to a point raised in the Introduction, the intrusiveness of a given instance of help is, to some extent, in the eye of the beholder. While we argue that some of the practices explored in the present research could be considered quite intrusive in the

sense that they would likely impede upon the recipient's learning and independence, it is unclear whether these same practices would necessarily be *perceived* as intrusive.

Whether or not a helper or help recipient perceives the help they provide or are given as “intrusive” likely depends on numerous factors, including aspects of the recipient, the helper, and the context. For instance, a child might be uninterested in doing a task themselves and thus not mind if their teacher takes over (or assume that their teacher thinks they are incompetent). At the same time, the teacher might not feel that the help they are providing is intrusive if they are worried about running short on time and simply need all of their students to have their work completed. Due to the third-party design of the present research, we were unable to explore first-person perspectives like these; however, future research should examine the conditions under which certain forms of help might come to be perceived as intrusive (or not). This work could also help to elucidate when gaps might arise between parents and children in terms of what kinds of help they feel is intrusive in a given context; identifying such gaps could help to inform interventions aimed at promoting more adaptive helping practices among parents.

Future work should also explore how one's cultural context might influence the extent to which certain types of help might feel intrusive, either as a helper or help recipient. The present studies did not examine cultural differences, but there is evidence that help can vary along cultural lines. For example, in landmark sociological research done with families, Lareau (2003) found that parents from different social classes in the United States tend to take different approaches to helping their children. According to Lareau (2003), middle-to-upper class parents tend to be highly involved in shaping their child's experiences to ensure that they succeed (an approach termed “concerted

cultivation”). In contrast, working class parents gravitate towards a “natural growth model”; they tend to take a more hands-off approach, believing that their child will figure out how to succeed through the experiences they naturally have as they move through childhood and beyond. While this prior work does not focus on how children themselves in these different social class contexts experience the help they receive, it is possible that help that feels more culturally normative – even if it entails more parental involvement – might be less likely to be experienced negatively, since the help can easily be attributed to a norm (rather than something about the child themselves). For instance, children who grow up in contexts where concerted cultivation is typical may not feel demotivated when their parent chooses their electives for them. Instead of feeling like this amount of help reflects on their parent’s beliefs about their competence, they might think that this is just something that parents often do in their context. This example illustrates just one way in which cultural factors might influence what actions are experienced as intrusive. Future research should further examine how culture could play a role in shaping children and adults’ perceptions of help.

### **Implications & Future Directions**

#### ***Implications for the literature.***

The present studies shed light on an important, yet underexplored question: why might parents engage in an intrusive approach to help? Our work provides a novel contribution by examining a potential psychological driver of intrusive parenting: namely, the belief that parents need to solve problems and make decisions for their children, even by the time they have reached young adulthood. We found that parents who more strongly held this belief also tended to agree more with highly intrusive

practices (Studies 1-4). Interestingly, these parents also seem to underestimate the negative messages that these practices can send (Study 8). Taken together, these findings suggest that the parents who might be most likely to engage in intrusive practices might also be least likely to recognize that these practices can send negative messages to children about their abilities. Future research should investigate whether parents who tend to endorse intrusive help also underestimate the maladaptive behavioral consequences that can arise from this type of help, such as avoiding challenges (Leonard et al., 2021; Schiffrin & Liss, 2017) or engaging less with school overall (Padilla-Walker & Nelson, 2012).

Such work examining parents' expectations for how intrusive forms of help might impact children's ability perceptions and motivation could eventually help to inform interventions aimed at reducing parental intrusiveness in an achievement context. The fact that some parents do not recognize its potential negative impact suggests one simple strategy that might be effective at reducing intrusiveness: simply educating parents about what this type of help is and how it might convey negative messages to children about their abilities. Future work should examine the effectiveness of such a strategy.

Additional work is also needed to explore how parents might develop such beliefs about the need to solve problems and make decisions for their children. These beliefs may relate to parents' beliefs about their influence over their child's academic achievement (Knight & Goodnow, 1988) or to their beliefs about how children learn (Hembacher & Frank, 2018; Miller, 1988) or when children become capable of completing certain tasks on their own (Furnham & Weir, 1996).

Indeed, it is possible that some parents might misrepresent their child's "region of sensitivity" (Mermelshtine, 2017; Wood & Middleton, 1975), or the gap between their current (observed) ability or performance and their potential ability. Underestimating the child's potential for eventually completing a task on their own might drive parents to feel that they need to step in and provide help (perhaps even more than is needed) in order for their child to succeed. When this help is in fact unneeded, it may be perceived as intrusive by the child. However, parents may not recognize this and may even continue to overhelp their child in the future if they think that this level of involvement was what drove their child's success.

Indeed, parents may have the best of intentions yet still inadvertently intrude. Calibrating one's help is challenging and the optimal strategy is often not obvious and can change depending on the child, the context, etc. Parents may be tempted to provide a lot of help when they feel their child's success is on the line. As noted above, educating parents on the potential negative messages that this help might send could be a useful first step in preventing parents from providing intrusive help. Another promising avenue could involve shifting parents' *goals*. Emerging evidence from parents of younger children (King, Hill, Rangel, Gotlib, & Humphreys, 2023; Schachnai, Asaba, Hu, & Leonard, 2024) suggests that the goals parents have when interacting with their children are influential in shaping their intrusiveness. For instance, King et al. (2023) found that mothers who were instructed to "learn something from [their] child" were less likely to engage in intrusive behaviors during a play session with their infant than mothers who were instructed to "[teach their] child something." Similarly, Schachnai et al. (2024) have suggested that highlighting a task as a learning opportunity can help to reduce the extent

to which parents take over and do that task for their children. Thus, it may be the case that encouraging parents to prioritize their child's learning could help to reduce intrusiveness. It is worth noting, however, that parents may interpret this goal differently; for instance, those who already believe that parents need to solve problems for their children may think their child does indeed learn when they provide a lot of help or even take over. Additional research is needed to determine how to effectively deliver such goal-based interventions to parents with different core beliefs about how their child learns or what they need to succeed.

Evolving parenting norms and trends may also shape what parents believe is necessary for their child's learning. As noted in the Introduction, agreement with a highly involved approach to parenting seems to be on the rise in the United States across social classes (Ishizuka, 2019). This increased support for higher parental involvement, as well as actual increases in involvement that might stem from such support, could result in parents feeling like the typical help they provide is not enough. Changing norms in schools could also add to the pressure parents might feel to do more. In many school systems, parents can now access updates on their child's academic performance on a daily basis. The availability of such information might cause parents to feel that they need to monitor their child's progress frequently (and potentially take action at the first sign that their child could be struggling). While all of this could support parents in adjusting their help in an adaptive way, it could also prompt parents to intervene before their child has a chance to improve on their own. Future work should explore how broader shifts in parenting and classroom norms might shape parents' beliefs as well as their actual helping practices.

In addition to offering insight into why parents might provide children with intrusive help, the present studies also point towards help as an important cue that children might use to make inferences about their ability. Studies 5-7 revealed that adults perceive those who receive more help from a teacher as less competent; they also thought that a teacher who provided intrusive help (i.e., who did a puzzle for a student) was conveying more of a fixed mindset about students' abilities (i.e., that only some students can get good at puzzles). As noted in the Limitations section, future research should explore when children begin to make these kinds of inferences.

Future work should also explore how adults and children perceive other help-related cues – for example, does a teacher providing unsolicited help (vs. solicited help) act as an even stronger cue of their perceptions of students' abilities? Additionally, future studies could investigate the extent to which adults and children generalize the inferences they make about their own or others' abilities on the basis of a teacher's help. For instance, if a teacher takes over and does a puzzle task for a child, does the child infer that their teacher thinks their *puzzle* abilities specifically are fixed, or do they also think that the teacher has a more fixed mindset about their abilities (or students' abilities) in general?

Finally, it is worth noting that while intrusive help can be problematic in many ways, there may also be times when teachers and parents do not provide *enough* help (Carr & Pike, 2012). Indeed, it is possible that efforts to intervene and reduce intrusive help among teachers and parents could backfire by prompting overcorrection; that is, teachers and parents who realize they need to step back may do so too much. Parents may also adopt a “false growth mindset” (Dweck, 2017) and believe that providing any

amount of help might undermine their child's sense of autonomy. It is important for future research to explore how to best support teachers and parents in striking a balance between providing help and granting their child opportunities to do things on their own.

***Implications for parents, teachers, & students.***

The present work also offers practical insights that could be helpful to parents, teachers, and children/students. First, one striking finding from the current studies is that intrusive help can not only convey negative messages about a student's present abilities, but also about whether those abilities can change. We know from past work that the mindset messages that get conveyed to students are important in shaping their motivation and achievement (Hecht, Dweck, Murphy, Kroeper, & Yeager, 2022; Muenks et al., 2020). However, we also know that parents' and teachers' practices are not necessarily an index of their actual mindsets (Haimovitz & Dweck, 2016, 2017). That is, parents and teachers who endorse growth mindsets may inadvertently convey fixed mindset messages via their practices. The current studies suggest that help may be one such practice that conveys mindset messages to children or students. In particular, intrusive help – i.e., doing a task for a student – may be particularly likely to communicate a fixed mindset about students' abilities. Thus, parents and teachers should be mindful of the help they provide and, when possible, elicit feedback from other adults (or from students themselves) so that they can get a better sense of how their help might affect students' self-views, mindsets, and motivation.

It is worth noting that, in our studies, participants inferred that a teacher who provided intrusive help was not just conveying that that particular student could not improve at puzzles, but that only some students could ever get good at puzzles at all.

Thus, paying attention to the help one provides is critical not just for the specific recipients of that help, but also for any other child or student who witnesses it. Indeed, help may be one piece that contributes to students' broader "mindset context" (Fuesting et al., 2019; Muenks et al., 2021); these contexts play an important role in shaping students' own mindsets (Walton & Yeager, 2020). When students feel that their learning environment supports a growth mindset, they tend to be better able to maintain a growth mindset themselves (Yeager et al., 2019). But when students feel that their learning environment is imbued with fixed mindset thinking, they might be less likely to maintain or enact a growth mindset – e.g., they might be less likely to ask for help or seek out challenges (Good & Shaw, 2021).

Of course, sometimes providing a lot of help is inevitable. As noted in Study 7, teachers and parents might provide a child or student large amounts of help for reasons aside from ensuring their success; for example, they might want to demonstrate how to do a task so that the child can do it themselves in the future. There may also be times when calibrating help is especially challenging and so parents and teachers might err on the side of providing more help. Our findings suggest that, while large amounts of help could be seen as intrusive, providing explicit framing might prevent the help recipient from making negative inferences about their ability or about the helper's beliefs about their ability. Specifically, giving a specific rationale and clarifying a pedagogical intention behind the current amount or type of help being provided seems to be especially effective at reducing the extent to which a large amount of help conveys a fixed mindset. While future work is needed to further explore the ways in which teachers and parents

can provide a lot of help without implicitly conveying negative messages, we hope that our findings can provide some initial guidance on this topic.

Finally, we believe that insights from the present work could be useful as researchers and teaching professionals think about how to design and build tools that support students' motivation. Particularly as AI and large language models become more prevalent in educational contexts, there are a growing number of opportunities to create evidence-based tools that provide individualized feedback and even help. Recently, a growing body of research has focused on how to leverage these technologies to create tools that promote growth mindset language (Handa et al., 2023) or promote better learning experiences through improved teaching (Demszky & Liu, 2023). Our findings could inform future efforts to fine tune or prompt engineer LLMs or AI-based “tutors,” with the goal of providing students with more effective and motivating help.

### **Conclusion**

The present studies explore why adults, including parents and teachers, might sometimes provide children or students with “intrusive” help, or more help than is needed. Across eight studies, we identified one potential driver of intrusive help among parents: namely, the belief that parents need to solve problems and make decisions for their children, even once they have reached young adulthood. We also explored the consequences of intrusive help, finding that, when teachers provide such help to a student, this can convey negative messages about students' abilities. Finally, we found that the parents who tend to endorse intrusive help themselves are also less likely to think that it conveys negative messages to children. Taken together, these findings provide key

insight into the beliefs that might drive intrusive help as well as the mechanisms by which it might dampen motivation.

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## Appendix A: Demographics Tables

### *Study 1*

| Demographics                        | Percentage |
|-------------------------------------|------------|
| <b>Number of Children</b>           |            |
| 1                                   | 30.3       |
| 2                                   | 46.5       |
| 3                                   | 16.2       |
| 4                                   | 2.0        |
| 5 or more                           | 5.1        |
| <b>Parent Gender</b>                |            |
| Male                                | 43.4       |
| Female                              | 55.6       |
| Prefer Not to Say                   | 1.1        |
| <b>Parent Education</b>             |            |
| Some high school                    | 0          |
| High school                         | 6.0        |
| Some college                        | 24.2       |
| College degree                      | 50.5       |
| Some graduate/professional training | 3.0        |
| Graduate or professional degree     | 16.2       |
| <b>Parent Income</b>                |            |
| <20k                                | 3.0        |
| 20-40k                              | 18.2       |
| 40-60k                              | 15.2       |
| 60-80k                              | 22.2       |
| 80-100k                             | 19.2       |
| 100-120k                            | 6.1        |
| >120k                               | 16.2       |

*Study 2*

| Demographics            |                                     | Percentage |
|-------------------------|-------------------------------------|------------|
| <b>Parent Gender</b>    |                                     |            |
|                         | Male                                | 49.1       |
|                         | Female                              | 50.0       |
|                         | Other                               | 0.9        |
| <b>Parent Education</b> |                                     |            |
|                         | Some high school                    | 0          |
|                         | High school                         | 5.3        |
|                         | Some college                        | 21.9       |
|                         | College degree                      | 46.5       |
|                         | Some graduate/professional training | 2.6        |
|                         | Graduate or professional degree     | 23.7       |
| <b>Parent Income</b>    |                                     |            |
|                         | <20k                                | 5.3        |
|                         | 20-40k                              | 14.9       |
|                         | 40-60k                              | 17.5       |
|                         | 60-80k                              | 20.2       |
|                         | 80-100k                             | 17.5       |
|                         | 100-120k                            | 7.9        |
|                         | >120k                               | 16.7       |

*Study 3*

| Demographics                        | Percentage |
|-------------------------------------|------------|
| <b>Number of Children</b>           |            |
| 1                                   | 34.3       |
| 2                                   | 47.1       |
| 3                                   | 11.4       |
| 4                                   | 5.7        |
| 5 or more                           | 1.4        |
| <b>Parent Gender</b>                |            |
| Male                                | 61.4       |
| Female                              | 38.6       |
| Prefer Not to Say                   | 0          |
| <b>Parent Education</b>             |            |
| Some high school                    | 0          |
| High school                         | 8.6        |
| Some college                        | 18.6       |
| College degree                      | 47.1       |
| Some graduate/professional training | 4.3        |
| Graduate or professional degree     | 21.4       |
| <b>Parent Income</b>                |            |
| <20k                                | 0          |
| 20-40k                              | 18.6       |
| 40-60k                              | 25.7       |
| 60-80k                              | 32.9       |
| 80-100k                             | 7.1        |
| 100-120k                            | 8.6        |
| >120k                               | 7.1        |

*Study 4*

| Demographics                        | Percentage |
|-------------------------------------|------------|
| <b>Number of Children</b>           |            |
| 1                                   | 36.1       |
| 2                                   | 40.3       |
| 3                                   | 13.9       |
| 4                                   | 5.7        |
| 5 or more                           | 3.5        |
| <b>Parent Gender</b>                |            |
| Male                                | 53.5       |
| Female                              | 46.5       |
| Prefer Not to Say                   | 0          |
| <b>Parent Education</b>             |            |
| Some high school                    | 0          |
| High school                         | 8.3        |
| Some college                        | 25.7       |
| College degree                      | 50.7       |
| Some graduate/professional training | 4.9        |
| Graduate or professional degree     | 10.4       |
| <b>Parent Income</b>                |            |
| <20k                                | 3.5        |
| 20-40k                              | 11.1       |
| 40-60k                              | 29.2       |
| 60-80k                              | 22.9       |
| 80-100k                             | 14.6       |
| 100-120k                            | 6.9        |
| >120k                               | 11.8       |

*Study 5*

| Demographics            |                                     | Percentage |
|-------------------------|-------------------------------------|------------|
| <b>Race/Ethnicity</b>   |                                     |            |
|                         | Black                               | 11.9       |
|                         | White                               | 70.6       |
|                         | Asian                               | 6.3        |
|                         | Hispanic                            | 3.1        |
|                         | Native American                     | 0.6        |
|                         | Other                               | 0.6        |
|                         | Prefer Not to Say                   | 0.6        |
|                         | Mixed Race                          | 6.3        |
| <b>Parent Gender</b>    |                                     |            |
|                         | Male                                | 56.3       |
|                         | Female                              | 43.1       |
|                         | Prefer Not to Say                   | 0.6        |
| <b>Parent Education</b> |                                     |            |
|                         | Some high school                    | 1.3        |
|                         | High school                         | 11.9       |
|                         | Some college                        | 29.4       |
|                         | College degree                      | 46.3       |
|                         | Some graduate/professional training | 3.1        |
|                         | Graduate or professional degree     | 8.1        |
| <b>Parent Income</b>    |                                     |            |
|                         | <20k                                | 11.9       |
|                         | 20-40k                              | 26.9       |
|                         | 40-60k                              | 26.9       |
|                         | 60-80k                              | 15.0       |
|                         | 80-100k                             | 8.1        |
|                         | 100-120k                            | 5.0        |
|                         | >120k                               | 6.3        |

*Study 6*

| Demographics            |                                     | Percentage |
|-------------------------|-------------------------------------|------------|
| <b>Race/Ethnicity</b>   |                                     |            |
|                         | Black                               | 10.8       |
|                         | White                               | 68.3       |
|                         | Asian                               | 8.3        |
|                         | Hispanic                            | 4.2        |
|                         | Native American                     | 0          |
|                         | Other                               | 0.8        |
|                         | Prefer Not to Say                   | 0.8        |
|                         | Mixed Race                          | 6.7        |
| <b>Parent Gender</b>    |                                     |            |
|                         | Male                                | 50.8       |
|                         | Female                              | 48.3       |
|                         | Prefer Not to Say                   | 0.8        |
| <b>Parent Education</b> |                                     |            |
|                         | Some high school                    | 0          |
|                         | High school                         | 15.8       |
|                         | Some college                        | 25.8       |
|                         | College degree                      | 46.7       |
|                         | Some graduate/professional training | 3.3        |
|                         | Graduate or professional degree     | 8.3        |
| <b>Parent Income</b>    |                                     |            |
|                         | <20k                                | 11.7       |
|                         | 20-40k                              | 25.8       |
|                         | 40-60k                              | 18.3       |
|                         | 60-80k                              | 14.2       |
|                         | 80-100k                             | 11.7       |
|                         | 100-120k                            | 7.5        |
|                         | >120k                               | 9.2        |
|                         | Unknown                             | 1.7        |

*Study 7*

| Demographics            |                                     | Percentage |
|-------------------------|-------------------------------------|------------|
| <b>Race/Ethnicity</b>   |                                     |            |
|                         | Black                               | 8.3        |
|                         | White                               | 81.7       |
|                         | Asian                               | 3.3        |
|                         | Hispanic                            | 5.0        |
|                         | Native American                     | 0          |
|                         | Other                               | 0          |
|                         | Prefer Not to Say                   | 0          |
|                         | Mixed Race                          | 1.7        |
| <b>Parent Gender</b>    |                                     |            |
|                         | Male                                | 65.0       |
|                         | Female                              | 35.0       |
|                         | Prefer Not to Say                   | 0          |
| <b>Parent Education</b> |                                     |            |
|                         | Some high school                    | 0          |
|                         | High school                         | 16.7       |
|                         | Some college                        | 28.3       |
|                         | College degree                      | 38.3       |
|                         | Some graduate/professional training | 3.3        |
|                         | Graduate or professional degree     | 13.3       |
| <b>Parent Income</b>    |                                     |            |
|                         | <20k                                | 5.0        |
|                         | 20-40k                              | 26.7       |
|                         | 40-60k                              | 30.0       |
|                         | 60-80k                              | 15.0       |
|                         | 80-100k                             | 6.7        |
|                         | 100-120k                            | 8.3        |
|                         | >120k                               | 8.3        |

*Study 8*

| Demographics            |                                     | Percentage |
|-------------------------|-------------------------------------|------------|
| <b>Race/Ethnicity</b>   |                                     |            |
|                         | Black                               | 8.5        |
|                         | White                               | 67.0       |
|                         | Asian                               | 10.1       |
|                         | Hispanic                            | 5.3        |
|                         | Native American                     | 0          |
|                         | Other                               | 0          |
|                         | Prefer Not to Say                   | 1.6        |
|                         | Mixed Race                          | 7.4        |
| <b>Parent Gender</b>    |                                     |            |
|                         | Male                                | 51.6       |
|                         | Female                              | 45.7       |
|                         | Other                               | 1.6        |
|                         | Prefer Not to Say                   | 1.1        |
| <b>Parent Education</b> |                                     |            |
|                         | Some high school                    | 0.5        |
|                         | High school                         | 12.8       |
|                         | Some college                        | 26.1       |
|                         | College degree                      | 43.6       |
|                         | Some graduate/professional training | 1.6        |
|                         | Graduate or professional degree     | 15.4       |
| <b>Parent Income</b>    |                                     |            |
|                         | <20k                                | 8.0        |
|                         | 20-40k                              | 9.6        |
|                         | 40-60k                              | 20.2       |
|                         | 60-80k                              | 18.6       |
|                         | 80-100k                             | 13.3       |
|                         | 100-120k                            | 12.2       |
|                         | >120k                               | 18.1       |

## Appendix B: Supplementary & Exploratory Analyses

### *Bayesian Analyses for Study 1*

Bayesian ordinal regression models, fit using default priors, revealed similar findings as our frequentist analyses. A model comparison between a compact model (containing all predictors with the exception of the interaction between belief score and intrusiveness 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 highly or less intrusive 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 highly intrusive 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 less intrusive 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 highly or less intrusive practices) as an ordinal, rather than continuous, variable, a conditional effects plot could be constructed. This plot, shown in

Figure 27, shows the effect of belief score for each individual response option on the 7-point, Likert-type agreement scale, split by intrusiveness (highly vs. less intrusive).

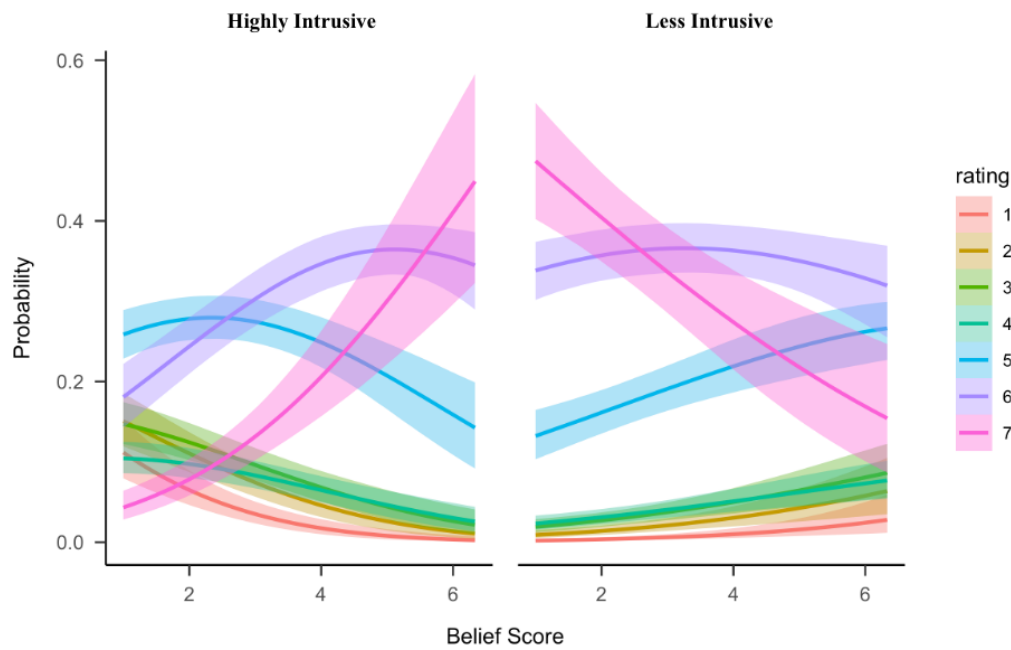
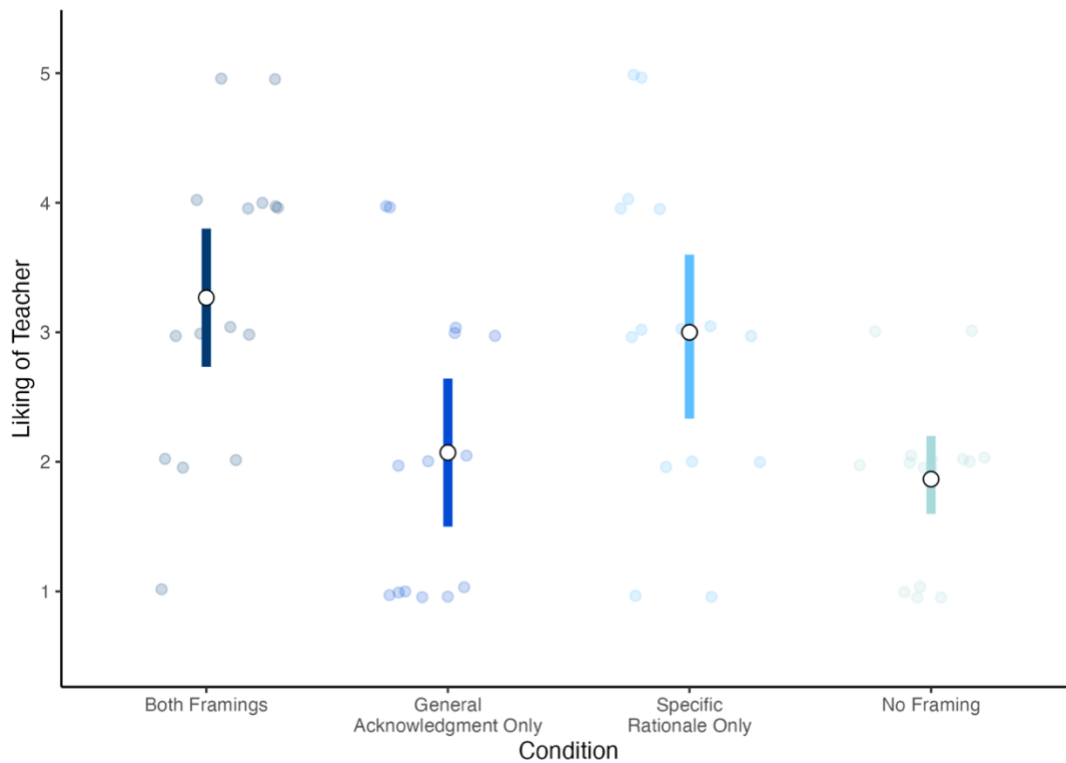


Figure 27. Bayesian conditional effects plot for Study 1.

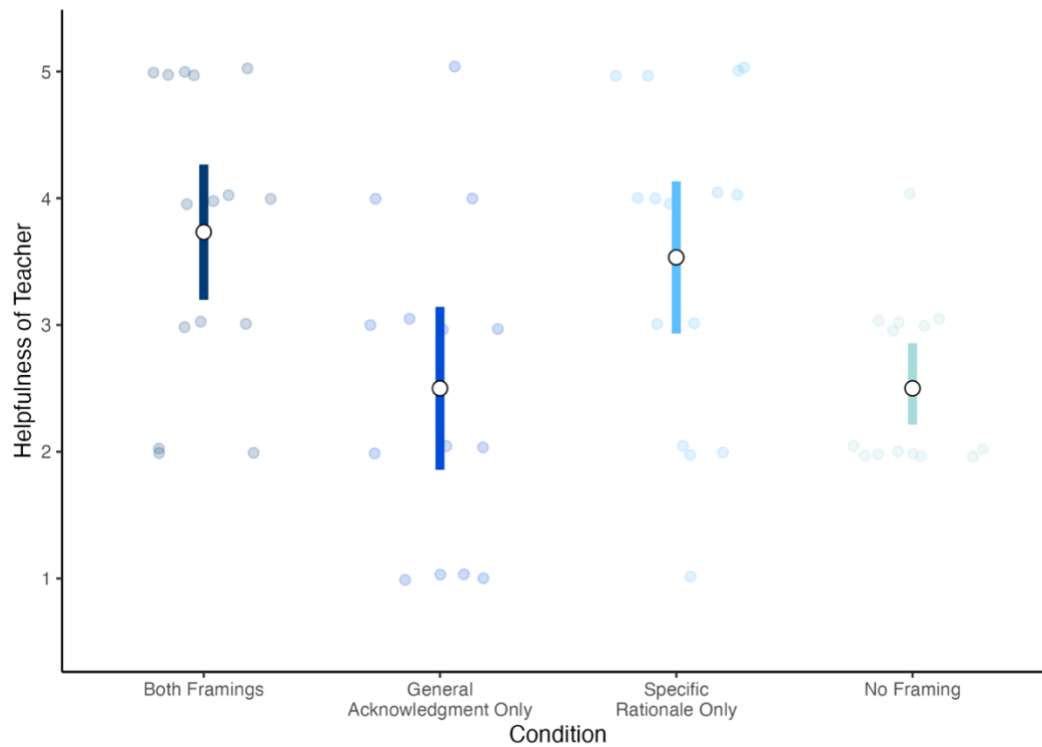
### *Exploratory Analyses for Study 7*

In Study 7, we asked participants a few exploratory measures after they had filled out our key measures; these exploratory measures mostly pertained to their perceptions of the teacher. The first measure asked: How much do you like this teacher? Participants responded on a Likert-type scale from 1 (“not at all”) to 5 (“a great deal”), with there also being an option to respond “not sure/don’t know.” 3 participants gave this latter response and were excluded from the plot below.



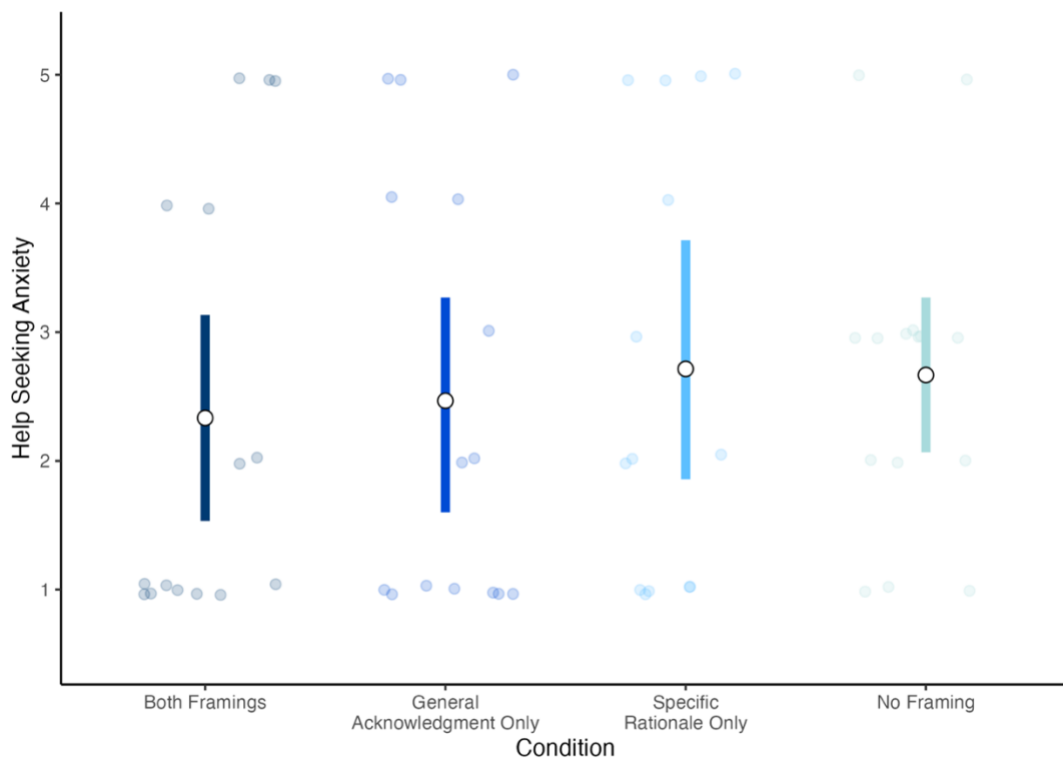
*Figure 28.* Adult participants’ ratings of how much they liked the teacher, plotted by condition. Points represent individual data, and the bars represent 95% bootstrap CIs.

The second measure asked: How helpful do you think this teacher is? Participants responded on a Likert-type scale from 1 (“not at all”) to 5 (“a great deal”), with there also being an option to respond “not sure/don’t know.” 6 participants gave this latter response and were excluded from the plot below.



*Figure 29.* Adult participants’ ratings of how helpful they thought the teacher was, plotted by condition. Points represent individual data, and the bars represent 95% bootstrap CIs.

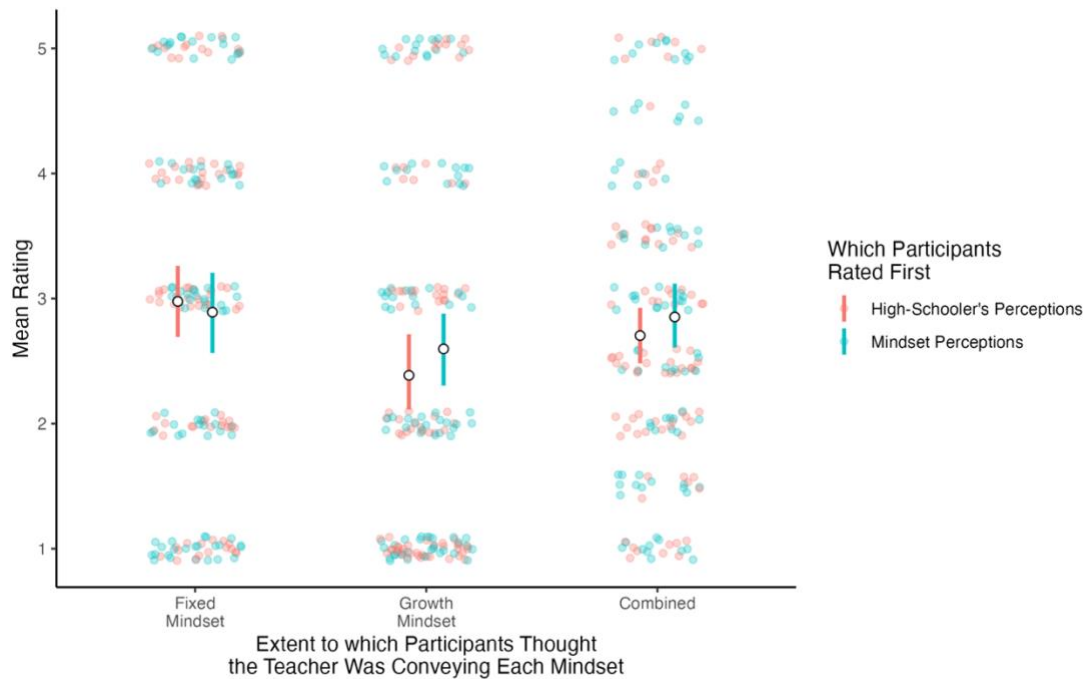
The third measure posed a hypothetical scenario to participants. They were told: “Imagine that you are a student in this teacher's class. One day, you are doing a puzzle and can't figure it out. How **nervous** would you be to ask this teacher for help?” Participants responded on a Likert-type scale from 1 (“not at all”) to 5 (“a great deal”), with there also being an option to respond “not sure/don’t know.” 3 participants gave this latter response and were excluded from the plot below.



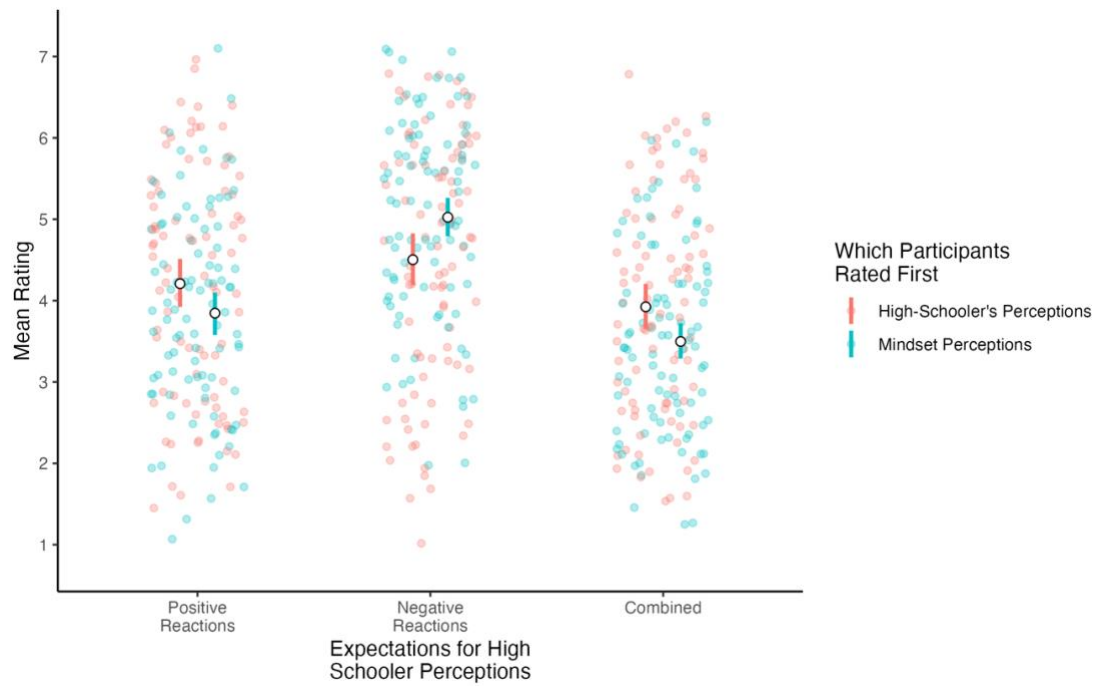
*Figure 30.* Adult participants’ ratings of how nervous they would be to seek help from the teacher, plotted by condition. Points represent individual data, and the bars represent 95% bootstrap CIs.

### *Exploratory Analyses for Study 8*

The plots below show differences between participants in their ratings depending on which key measure they saw first (i.e., the mindset perceptions measure or the measure assessing expectations for how the high-schooler would feel).



*Figure 31.* Parents' ratings of the extent to which they thought the teacher was conveying a fixed or growth mindset, plotted by which measure they saw first. Points represent individual data, and the bars represent 95% bootstrap CIs.



*Figure 32.* Parents' ratings of the extent to which they thought the high-schooler would react positively or negatively to their parent's help, plotted by which measure they saw first. Points represent individual data, and the bars represent 95% bootstrap CIs.