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Ford, Brett Quaid

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The Costs of Believing Emotions are Uncontrollable:
Youths' Implicit Theories of Emotion Predict Emotion Regulation and Depressive Symptoms

By

Brett Quaid Ford

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requirements for the degree of

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Committee in charge:

Professor Iris Mauss, Chair

Professor Robert Levenson

Professor Dacher Keltner

Professor Dana Carney

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Abstract

The Costs of Believing Emotions are Uncontrollable:

Youths' Implicit Theories of Emotion Predict Emotion Regulation and Depressive Symptoms

by

Brett Quaid Ford

Doctor of Philosophy in Psychology

University of California, Berkeley

Professor Iris Mauss, Chair

Abstract:

As humans, we have a unique capacity to theorize about our experiences, including our emotions. We develop implicit theories about the nature of emotions, and these beliefs are consequential, guiding whether and how we try to influence our emotions and how we feel as a consequence. One fundamental belief about emotions concerns whether emotions are relatively controllable or uncontrollable. I propose that believing emotions are uncontrollable (*entity beliefs*) should reduce individuals' use of emotion regulation strategies that could help them change their emotional experiences (e.g., cognitive reappraisal). This, in turn, could negatively influence psychological health (e.g., depressive symptoms). This model holds particular relevance during youth, when beliefs about emotions first develop and stabilize and when maladaptive beliefs could contribute to the rising depression rates that characterize adolescence. In the present investigation, a pilot diary study (N=223, aged 21-60) demonstrated that individuals' entity beliefs predicted less use of cognitive reappraisal in everyday life. Then, two studies examined whether entity beliefs set youths on a maladaptive trajectory: In a cross-sectional study (N=136, aged 14-18), youths with stronger entity beliefs experienced more depressive symptoms because they used reappraisal less frequently. This pattern was replicated and extended in a longitudinal study (N=227, aged 10-18), where depressive symptoms were assessed using youth and parent reports 18 months after assessing beliefs. These results suggest that entity beliefs about emotion are risk factors for depression that act via emotion regulation. Because beliefs are still developing in youths, targeting youths' beliefs represents an important avenue for prevention and intervention.

**The costs of believing emotions are uncontrollable:
Youths' implicit theories of emotion predict emotion regulation and depressive symptoms**

Philosophers have theorized about the nature of human emotion for millennia. Theorizing about emotion, however, is not the unique purview of philosophers or psychologists. Rather, all humans have the potential to develop theories about emotion. These *implicit theories of emotion* – or beliefs about how emotions work – are consequential, guiding whether and how we try to influence our emotions and how we feel as a result. One particularly fundamental belief about emotion concerns whether emotions are relatively controllable or uncontrollable.

Here I propose that believing emotions are relatively uncontrollable (*entity beliefs*) should reduce individuals' attempts to use forms of emotion regulation that could help them change their emotional experiences (e.g., cognitive reappraisal). This, in turn, should negatively influence psychological health (e.g., depressive symptoms). This model holds particular relevance during youth, a time when beliefs about emotions first develop and stabilize and when cognitive risk factors – like entity beliefs – can contribute to the rising psychological health concerns that characterize adolescence. To examine whether entity beliefs put youths on a maladaptive trajectory, I tested whether children and adolescents with stronger entity beliefs exhibit worse psychological health and whether this relationship was accounted for by emotion regulation processes.

Beliefs about Emotion

Emotions are ubiquitous and powerful experiences that are central to how we relate to our environment and each other. It is thus natural that we spend time thinking, discussing, and developing beliefs about emotions. Many of our beliefs about emotions can be traced to two fundamental debates. One of these debates concerns our attitude towards emotions: to what extent are emotions good and helpful versus bad and harmful? A second fundamental debate concerns whether emotions can be controlled: to what extent are emotions uncontrollable (arriving unbidden and departing of their own accord) versus controllable (shaped and modulated according to our will)?

Although a growing literature has examined people's beliefs about whether emotions are good or bad (Ford & Mauss, 2014; Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011; Mikulincer & Ben-Artzi, 1995; Tamir, 2009; Tsai, 2007), there are very few empirical investigations of people's beliefs about whether emotions can be controlled. Rather, much of the available discourse on beliefs about the controllability of emotion has occurred in the writings of philosophers. The Stoics, for example, rejected the idea that emotions were outside of our control or were imposed upon us (Epictetus, 1906). Others have taken an opposing view: for example, Sentimentalist David Hume suggested that emotions cannot be controlled when he said that "reason is and ought only to be slave of the passions" (Hume, 1739). These ideas have traced their way through the centuries (Nussbaum, 2001; Solomon, 2007), as new historical movements (e.g., the enlightenment) and thought leaders (e.g., Freud) weighed in on either side of the same debate: Who is in charge – 'reason' or 'emotion'?

This debate has endured for thousands of years perhaps because there are strong intuitions on either side. And indeed, this debate continues as each person decides for her- or himself whether emotions are controllable. In this way, we are each our own emotion theorist. In turn, these theories should have important consequences for us. I propose here that individuals' implicit theories about the controllability of emotions critically shape their psychological health:

people who believe emotions are relatively uncontrollable – who hold *entity beliefs* about emotion – should be less likely to use forms of emotion regulation that are aimed at changing emotional experiences (e.g., cognitive reappraisal), but not necessarily other forms of emotion (e.g., expressive suppression). Being less likely to use these beneficial forms of emotion regulation should, in turn, contribute to core indices of worse psychological health, like greater depressive symptoms.

I now review evidence for the link between entity beliefs about emotions and psychological health. Then, I review evidence for the link between entity beliefs and emotion regulation, and whether emotion regulation could act as a mechanism between entity beliefs and psychological health. Finally, I discuss why this model is important to test within youths and finish by outlining open questions that the present investigation aims to address.

Beliefs about Controllability

People's *implicit theories* – or beliefs about how the world works – have been largely examined within the domain of intelligence (Dweck & Leggett, 1988). Individuals who believe that an attribute is relatively uncontrollable have been referred to as *entity theorists* while those who believe that an attribute is relatively controllable have been referred to as *incremental theorists*; these terms represent two ends of a spectrum capturing beliefs about whether a given attribute is controllable (i.e., amenable to change by the individual). This research has identified important links between holding relatively stronger entity (vs. incremental) beliefs about intelligence and psychological outcomes. Specifically, those with stronger entity beliefs about intelligence experienced worse academic outcomes in the long-run because they were less likely to focus on learning and to maintain persistence in the face of challenge (Blackwell, Trzesniewski, & Dweck, 2007). This research has also demonstrated the causal role of these beliefs, finding that individuals who were experimentally trained to reduce their entity beliefs experienced better academic outcomes in the future (Aronson, Fried, & Good, 2002; Blackwell et al., 2007). These findings support a model wherein believing an attribute cannot (vs. can) be controlled reduces individuals' attempts to alter or improve that attribute, which can affect downstream outcomes.

Importantly, research suggests that entity beliefs are domain-specific: holding relatively stronger entity beliefs in one domain – like intelligence – does not necessarily lead to stronger entity beliefs in other domains – like emotion (Hughes, 2015; Tamir, John, Srivastava, & Gross, 2007). Furthermore, entity beliefs appear to be uniquely linked with outcomes specifically related to those beliefs (e.g., entity beliefs about intelligence are linked with academic outcomes and not with emotional outcomes) (Romero, Master, Paunesku, Dweck, & Gross, 2014). Given that entity beliefs about different attributes are conceptually and empirically distinct from each other, the body of research on entity beliefs about intelligence does not necessarily inform our understanding of entity beliefs about emotion. Indeed, we do not yet know much about entity beliefs about emotion even though they represent an important area of research.

Beliefs about the Controllability of Emotion: Defining Terms

Before turning to the empirical literature examining beliefs about the controllability of emotion, it is important to clearly define relevant terms. This is particularly important because researchers within this literature have at some times employed different terms when discussing similar concepts, and at other times have employed the same term when discussing different concepts.

The present research is rooted in the literature that has primarily used the term *implicit theory* (sometimes called *implicit belief*, *lay theory*, *folk theory*, or more recently, *mindset*), which is defined as a tacit understanding of how the world works. As Dweck and colleagues phrase it, an implicit theory “can be seen as a core assumption in an individual’s world view... an assumption that defines the individual’s reality and imparts meaning to events” (p. 268, Dweck, Chiu & Hong, 1995).

An *entity theory* (also called *entity belief*), in turn, represents a particular category of implicit theory that specifically refers to whether a given attribute can or cannot be controlled. Throughout the rest of this paper, I refer to *entity beliefs about emotion*, rather than *entity theories of emotion*, because an entity belief about emotion represents a single – though fundamental and influential – belief, and a *theory* is typically comprised of a set of multiple beliefs.

Using the term *entity beliefs about emotion*, researchers have actually assessed two different types of beliefs. One is a general belief about whether emotions are controllable – a belief about how the world works – which has been assessed by measuring participants’ endorsement of items like, “*People have very little control over their emotions*”. The other is a more specific belief about whether individuals believe that they themselves can control their emotions, which has been assessed by measuring participants’ endorsement of items like, “*I have very little control over my emotions*”.

Although beliefs about the world in general may potentially be related to beliefs about the self, these are conceptually distinct psychological constructs. Specifically, when someone endorses the general item “*People have very little control over their emotions*”, they are directly reporting on the extent to which they hold an entity belief, a pervasive belief about how emotions work in the world. Conversely, when someone endorses the self-specific item “*I have very little control over my emotions*”, they are reporting a belief about their personal level of self-efficacy in regulating their own emotions. While emotion regulation self-efficacy beliefs may be linked with entity beliefs, these are not the same.

Additional research has employed a relatively ambiguous phrasing that could reflect individuals’ entity beliefs but may also reflect emotion regulation self-efficacy beliefs (“*You have very little control of your emotions*”). This phrasing was derived from early measures of implicit beliefs about the controllability of intelligence (Dweck, 1999). However, research on implicit beliefs about intelligence has not been concerned with parsing apart general implicit beliefs from self-specific perceptions of efficacy.

I argue that these constructs – entity beliefs about emotion and emotion regulation self-efficacy – are important to consider separately because they are conceptually distinct. They are arguably hierarchically organized: entity beliefs about emotion represent a fundamental and relatively superordinate belief that should have a broad influence on the self as well as perceptions of others and the world which may, in turn, shape individuals’ emotion regulation self-efficacy. Initial empirical investigations provide some evidence that emotion regulation self-efficacy is a mechanism that links entity beliefs about emotion with downstream outcomes (De Castella et al., 2013; Tamir et al., 2007), supporting the argument that entity beliefs about emotions and emotion regulation self-efficacy are conceptually and empirically distinct and may also be hierarchically organized. These findings further emphasize how crucial it is that we distinguish entity beliefs about emotion from emotion regulation self-efficacy in our theorizing and our measurement. To this end, we focused the present investigation and literature review on

entity beliefs and make a firm conceptual distinction when considering research that has used self-specific measures.

Beliefs about the Controllability of Emotion and Psychological Health

Although there is a burgeoning interest in understanding individuals' beliefs about the controllability of emotion, only a relatively small number of studies have assessed these beliefs. Even fewer studies have assessed these beliefs using measures that precisely assess entity beliefs about emotion (rather than emotion regulation self-efficacy). The first study to cleanly target entity beliefs about emotion found that college students who believed that emotions were relatively uncontrollable (i.e., held stronger entity beliefs) at the beginning of their freshman year of college experienced greater levels of depression at the end of their freshman year (Tamir et al., 2007). The link with depression was also specific to entity beliefs about *emotion* and did not extend to entity beliefs about intelligence, thereby demonstrating the domain-specificity of entity beliefs about emotion.

More recently, researchers began to extend this original finding: Two recent cross-sectional studies found that college students who believe emotions are relatively uncontrollable report lower well-being and greater mood disorder symptoms (e.g., anxiety, depression) (De Castella et al., 2013; Schroder, Dawood, Yalch, Donnellan, & Moser, 2015). An additional study also assessed the clinical implications of these beliefs and found that entity beliefs about emotion were stronger in adults diagnosed with social anxiety disorder compared to healthy controls (De Castella et al., 2014). This small body of work supports the idea that people who believe emotions are relatively uncontrollable experience worse psychological health, perhaps especially in the domain of mood symptoms.

One key element in the present conceptualization of entity beliefs is that these beliefs should contribute to worse psychological health and should not be merely a component of, or a result of, worse psychological health. This proposition is consistent with the longitudinal study (Tamir et al., 2007), in which entity beliefs *predicted* worse psychological health in the future. This proposition is also consistent with prior research that experimentally manipulated entity beliefs about intelligence – using interventions that helped youths reduce their entity beliefs – which found that entity beliefs about intelligence have a causal influence on downstream academic outcomes (Aronson et al., 2002; Blackwell et al., 2007).

An additional element in the present conceptualization of beliefs is that these relatively abstract beliefs should shape downstream outcomes via key mediating processes, rather than by a strong direct link between beliefs and outcomes. Thus, in the next section, we discuss a plausible mechanism in the link between entity beliefs about emotion and psychological health.

Beliefs about the Controllability of Emotion and Emotion Regulation

How might entity beliefs about emotion influence downstream psychological health? To identify a plausible mechanism, it is useful to consider that entity beliefs about emotion reflect a view that emotional experiences are fundamentally uncontrollable (e.g., by endorsing items such as “*No matter how hard they try, people can't really change the emotions that they have*”). Thus, these beliefs should shape whether individuals attempt to regulate their emotional experiences (Tamir & Mauss, 2011). After all, why would someone invest effort in controlling something they do not believe can actually be controlled? One commonly used and widely studied emotion regulation strategy known to help individuals change their emotional experiences is *cognitive reappraisal*, a strategy that involves reframing the meaning of an emotional event (Gross, 2002;

Gross, Richards, & John, 2006; Webb, Miles, & Sheeran, 2012). Entity beliefs about emotion should be particularly likely to shape individuals' use emotion regulation strategies that effectively target their emotional experiences, like reappraisal, but should be less likely to shape individuals' use of strategies that do not target emotional experiences (like expressive suppression, a strategy that involves simply masking one's emotions from others).

One laboratory study provides an initial piece of evidence for a link between entity beliefs about emotion and emotion regulation: when adult participants were exposed to a negative mood induction, those with chronically-held stronger (vs. weaker) entity beliefs experienced worse mood after the induction (Kappes & Schikowski, 2013). These findings are ambiguous, however, as to whether those with greater entity beliefs were less motivated to use emotion regulation, whether they were less able to use emotion regulation, or whether they were simply more emotionally reactive to the aversive experience.

Two recent experimental studies have provided more direct evidence that entity beliefs about emotion shape individuals' attempts to engage in emotion regulation. In an online experiment, adults were induced to hold stronger (vs. weaker) entity beliefs about emotion by reading a passage describing the fixed (vs. malleable) nature of emotion. These individuals, in turn, were less likely to engage in a variety of cognitive emotion regulation strategies, including reappraisal, during a subsequent negative mood induction (Kneeland, Nolen-Hoeksema, Dovidio, & Gruber, in press-a). In an additional laboratory experiment that also assessed expressive suppression, adults were induced to hold entity beliefs about emotion using a similar method as above and were then asked to give a stressful public speech. Adults who were induced to hold a stronger (vs. weaker) entity belief about emotion were less likely to use cognitive reappraisal, but were *not* less (or more) likely to use expressive suppression (Kneeland, Nolen-Hoeksema, Dovidio, & Gruber, in press-b).

These experimental findings are consistent with a small number of correlational studies that assessed chronically-held entity beliefs and the habitual use of emotion regulation: individuals with stronger entity beliefs about emotion reported less frequent use cognitive reappraisal (De Castella et al., 2013; Schroder et al., 2014; Tamir et al., 2007), but were neither more nor less likely to use expressive suppression (Tamir et al., 2007; Schroder et al., 2014). Taken together, these findings broadly suggest that entity beliefs are linked with emotion regulation, and specifically suggest that entity beliefs may uniquely predict strategies that target emotional experiences, like reappraisal. This pattern provides further motivation to understand entity beliefs about emotion because reappraisal is also typically considered "healthy" to use in the long run (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Gross & John, 2003; John & Gross, 2004). Thus, entity beliefs could have an important influence on reducing individuals' use of a particularly healthy emotion regulation strategy, which could have important downstream consequences for psychological health. Indeed, this is the model the current investigation is designed to test (see Figure 1).

[Insert Figure 1 about here]

Building on theory and preexisting literature, I propose a meditational model such that entity beliefs about emotion will shape downstream psychological health via the reduced use of reappraisal. This mediation has not yet been tested, although one study does provide preliminary support for the theory behind this model. Within this study, individuals who believed that emotions are relatively uncontrollable experienced worse longitudinally-assessed psychological health, and this was partially mediated by emotion regulation self-efficacy – one's confidence in being able to regulate one's emotions (Tamir et al., 2007). This finding underscores the

importance of separately considering entity beliefs about emotion and emotion regulation self-efficacy, given that emotion regulation self-efficacy appears to act as a mediator linking entity beliefs about emotion with psychological health. This finding also underscores the role of emotion regulation processes as a mediator between entity beliefs and psychological health. However, by focusing on emotion regulation self-efficacy in general, this research does not yet speak to the specific strategies that individuals with stronger entity beliefs are more or less likely to use.

Overall, prior evidence suggests that entity beliefs about emotion are linked with worse psychological health and with the reduced use of certain forms of emotion regulation (e.g., reappraisal). These findings lay the groundwork for the meditational model the present investigation was designed to test: are individuals with stronger entity beliefs at risk for worse psychological health because they are less likely to use reappraisal?

Beliefs about the Controllability of Emotion in Youths

Youth – and particularly the transition from childhood to adolescence signified by puberty which typically occurs when youths are between 10-16 years old – is an especially crucial time in which to examine entity beliefs about emotion for at least four reasons.

First, there is scarce research on youths' entity beliefs about emotion, but even though these beliefs are likely still forming during youth, there is good reason to expect that youths can reliably report on their beliefs about emotion. Prior research on youths' entity beliefs in other domains (e.g., intelligence, personality) suggests that children as young as 9 years old can reliably report on their entity beliefs (Blackwell et al., 2007; Erdley & Dweck, 1993). Prior research on youths' understanding of emotions suggests that children develop abstract conceptual knowledge about emotions during the childhood years approaching adolescence (Harris, Olthof, & Terwogt, 1981). Taken together, these findings suggest that relatively young children are able to report on their entity beliefs about emotion, setting the stage for examining how these beliefs relate to key downstream outcomes.

Second, the transition to adolescence represents a period of heightened vulnerability to psychological problems (Arnett, 1999). While undergoing this psycho-socially and biologically stressful period, cognitive factors can shape psychological health in powerful ways (Hankin & Abramson, 2001). For example, researchers have observed striking increases in depression onset between 13 and 18 years of age (Hankin et al., 1998), and cognitive risk factors (e.g., rumination) are thought to play a key role in this increase. Entity beliefs about emotion could thus represent an additional cognitive risk factor that shapes psychological health, including greater levels of depressive symptoms.

Third, depression during childhood and adolescence strongly predicts depression throughout adulthood (Kessler et al., 2005; Pine, Cohen, Cohen & Brook, 1999). Thus, understanding if entity beliefs about emotions put youths at risk can help identify an important prevention and intervention target that can have crucial cumulative benefits, possibly across the lifespan.

Fourth, preliminary evidence suggests that entity beliefs shape adults' use of reappraisal and if this pattern extends to youths' emotion regulation, entity beliefs could rob youths of opportunities to practice valuable forms of emotion regulation. Using reappraisal less frequently is related to worse psychological health for children (e.g., age 10), just as it is for adults (Carthy, Horesh, Apter, Edge, & Gross, 2010; E. K. Hughes, Gullone, & Watson, 2011). Given this, entity beliefs about emotion could set youths down a dangerous path: they may be less likely to

gain skill in reappraisal and may even be less likely learn it in the first place. This cascade could have both short and long term consequences if entity beliefs foster worse outcomes in youth that persist throughout adulthood.

Although youth is a particularly important time in which to assess entity beliefs about emotion, we currently know very little about these beliefs in youths. Indeed, there is almost no research on youths' entity beliefs in the domain of emotion. Research from other domains, however, indicates that entity beliefs are important for youths' development. For children as young as 9 years, entity beliefs predict key domain-specific outcomes: entity beliefs about intelligence predict academic achievement outcomes (Blackwell et al., 2007) and entity beliefs about personality predict social outcomes (Erdley & Dweck, 1993). These lines of research suggest that entity beliefs about emotions are promising to examine in youths and may have key implications for emotion domain-specific outcomes (e.g., psychological health).

Only two prior studies have examined entity beliefs about emotion in youths (Romero et al., 2014; Schleider & Weisz, 2016, in press). In both of these studies, entity beliefs about emotion were reliably measured in 11-14 year olds, suggesting that children and adolescents can report on their entity beliefs about emotion, as they can in other domains. Youths' entity beliefs about emotion also predicted worse psychological health, providing an initial clue that these entity beliefs about emotion are a valuable direction for future research. These studies come with the caveat, however, that entity beliefs were assessed using ambiguous items (with endorsement of items like "*You have very little control of your emotions*") that make it difficult to interpret whether the findings pertain to entity beliefs about emotion (versus emotion regulation self-efficacy).

Taken all together, the small body of available research suggests that it is methodologically viable to assess youths' entity beliefs about emotions and that these beliefs may have important downstream implications.

Open Questions Regarding Beliefs about the Controllability of Emotion and Psychological Health

A small but growing literature has laid an important foundation for the hypothesis that entity beliefs about emotions are associated with worse psychological health via their effects on emotion regulation. However, as expected within any nascent literature, there are several open questions that need be addressed.

First, as described above, several measures of "entity beliefs" about emotion have been used, but these measures likely assess different constructs (entity beliefs about emotion versus emotion regulation self-efficacy). The measure that most cleanly targets people's entity beliefs about emotions has been used in very few investigations (De Castella et al., 2013; De Castella et al., 2014; Schroder et al., 2015; Tamir et al., 2007). And thus, we currently do not know much about the link between entity beliefs about emotions and psychological health.

Second, nearly all studies on entity beliefs about emotion focused on adults. Two studies focused on youths (Romero et al., 2014; Schleider & Weisz, in press), but both employed relatively small samples ($Ns = 113$ and 59 , respectively), and used an ambiguous measure of beliefs that could refer to entity beliefs about emotion or to emotion regulation self-efficacy. Thus, we presently cannot draw confident conclusions regarding how entity beliefs about emotion are linked with psychological health in youths. Establishing these links in youths is an important direction for research given that entity beliefs about emotion should still be developing

during youth. Entity beliefs may also represent a core cognitive risk factor that puts youths at risk for worse psychological health that may even extend into adulthood.

Third, all but one study linking entity beliefs about emotion and psychological health has relied on self-reported psychological health. Although self-report measures provide a strong foundation, it would foster greater confidence in the validity of the present model to find links between these beliefs and other methods of assessing psychological health that may be less influenced by common method variance and possible self-reported biases.

Fourth, although three studies have tested longitudinal links between entity beliefs and psychological health (Romero et al., 2014; Schleider & Weisz, in press; Tamir et al., 2007), there have not yet been any optimal tests of whether entity beliefs *prospectively* predict worse psychological health in the future (i.e., testing whether beliefs predict worse psychological health in the future, even when controlling for initial levels of psychological health). The benefit of controlling for initial levels of psychological health is that the resulting prospective analyses can indicate whether initial entity beliefs predict change in psychological health, therefore informing our understanding of the directionality of the link. When conducting these analyses, it is important that initial levels of psychological health are not extremely highly correlated with later levels of psychological health – as might be the case if the two assessments are relatively close together in time – because the strong link between the same construct measured twice can overshadow other meaningful predictors (see Schleider & Weisz, in press). A more optimal longitudinal design would provide enough time between assessment points to ensure that the initial and later assessments of the outcome were not redundant with each other.

Finally, only one study tested a mechanism that might link entity beliefs about emotion with worse psychological health (Tamir et al., 2007) and no study has tested which specific forms of emotion regulation might account for the link between entity beliefs about emotion and psychological health. It is essential to identify plausible mechanisms not only to better understand the basic nature of how entity beliefs exert their possible influence.

Current Investigation

The current investigation was designed to test the links between entity beliefs about emotion, emotion regulation, and depressive symptoms. First, a pilot study examined whether entity beliefs predicted the use of emotion regulation in individuals' every day lives and whether this link was specific to strategies that target emotional experiences (e.g., cognitive reappraisal) versus strategies that do not (e.g., expressive suppression). Then, Study 1 tested whether youths' entity beliefs were linked with reduced use of reappraisal, and whether reappraisal acted as a mechanism linking entity beliefs about emotion with worse psychological health (i.e., depressive symptoms). Finally, Study 2 replicated and extended Study 1 by assessing depressive symptoms 18 months after the assessment of beliefs and using both youth and parent reports. These studies have several notable features that work towards addressing the open questions identified above.

First, I cleanly assessed individuals' entity beliefs about emotions by measuring their endorsement of items like: "*People have very little control over their feelings*". These items relate to a "core assumption in an individual's world view" (p. 268, Dweck, Chiu & Hong, 1995), thus placing the scale firmly within the purview of entity beliefs and not emotion regulation self-efficacy.

Second, I propose that entity beliefs about emotion are a risk factor for children approaching and undergoing adolescence, a time characterized by vulnerability to worse psychological health (Arnett, 1999). Thus, I tested this hypothesis within two samples of youths,

providing a test of how entity beliefs about emotion are linked with psychological health in non-adult samples. These two samples capture a relatively wide age range (14-18 years old in Study 1, 10-18 years old in Study 2) that covered the pre-adolescent period as well as the transition through puberty and into adolescence, thus allowing me to test whether these effects are consistent across adolescent development.

Third, I assessed depressive symptoms as a key index of psychological health, and assessed these symptoms using both youths' self reports as well as an informant's reports (i.e., one of their parents). Assessing depressive symptoms with an informant's report is a valuable way to test the robustness and validity of the link between entity beliefs and psychological health. Assessing entity beliefs and psychological health using a common method could inadvertently inflate their correlation. An informant's report is less likely to be influenced by biases due to common method or other possible biases in individuals' self-reported measures.

Fourth, in addition to conducting a preliminary cross-sectional study (Study 1), I conducted a longitudinal study (Study 2). In Study 2, I was able to test whether entity beliefs predict depressive symptoms 18 months in the future. Importantly, I was also able to test whether youths' entity beliefs *prospectively* predicted their future depressive symptoms (i.e., when controlling for initial levels of symptoms) across a relatively long period of time.

Fifth, I assessed a plausible mechanism that could account for the link between youths' entity beliefs about emotion and psychological health: the use of emotion regulation. Specifically, because entity beliefs target emotional *experiences*, I predict that the link between entity beliefs and emotion regulation may be unique to the reduced use of emotion regulation strategies targeting emotional *experiences* (i.e., cognitive reappraisal) and not necessarily the use of strategies that target other aspects of the emotional response, such as external emotional *expressions* (i.e., expressive suppression). To examine the specificity of the link between entity beliefs and emotion regulation, I assessed reappraisal and suppression, two widely used strategies (Gross & John, 2003; Gross et al., 2006) that are known to be reliably reported on by youths 10-18 years old (Gullone & Taffe, 2012). In Study 1 and 2, I assessed habitual reappraisal and suppression using questionnaires, and in the Pilot Study, I assessed them using daily diaries that measured the extent to which participants used these two strategies during their day-to-day stressors. This pilot study provides the first test of whether entity beliefs about emotion are linked with the emotion regulation that people use in their every day lives.

Finally, the present studies provided an opportunity to explore novel questions about how entity beliefs about emotion might vary as a function of age and gender. For example, entity beliefs may be lower in younger vs. older children (if younger children have relatively less experience with emotion control) or may be lower in girls vs. boys (if girls are less likely to be socialized to control their emotions). Age and gender may also shape the links between entity beliefs, emotion regulation, and depressive symptoms. For example, entity beliefs may be a stronger predictor of depressive symptoms in older children (who have had more time for their beliefs to shape psychological health), or in girls (who are at much greater risk for developing depressive symptoms during adolescence; Hankin et al., 1998). While the current investigations' primary hypothesis was to test a model wherein entity beliefs about emotion predict greater depressive symptoms via less frequent use of emotion regulation, these data also allowed me to explore interesting secondary questions regarding how age and gender may shape that model.

Pilot Study

An initial pilot study tested the first link in the proposed mediation model – whether entity beliefs predict less frequent use of emotion regulation. This study had three specific aims: first, I examined whether entity beliefs were uniquely linked to emotion regulation strategies targeting emotional experiences (e.g., cognitive reappraisal) by assessing cognitive reappraisal as well as a strategy that does not target emotional experiences (e.g., expressive suppression), which I did not expect to be related to entity beliefs about emotion. Second, I tested whether entity beliefs predicted reappraisal used in individuals' daily lives, beyond questionnaire reports of reappraisal that could inflate the link with entity beliefs due to their common questionnaire method. To do so, participants reported their daily use of reappraisal and suppression across a week of daily diaries in the context of their most stressful daily events, the times where we expect to see emotion regulation habits being activated. Third, this pilot allowed me to test whether the link between entity beliefs and the daily use of reappraisal held when controlling for possible confounding factors (general sense of low self-efficacy, general pessimism about the future, or heightened negative emotional reactivity in response to stressors, which were not assessed in the youth samples). To my knowledge, only one other study tested whether the link between entity beliefs and a questionnaire assessment of reappraisal was robust when controlling for one possible confound (i.e., emotional intensity; Tamir et al., 2007). Thus, this study provides additional foundational support for the discriminant validity of entity beliefs about emotion and the unique predictive power of those beliefs above and beyond other related constructs.

Method

Participants. A sample of community adults was recruited from the Denver metropolitan area as part of a larger research project. The larger research project began with 339 participants and a subset of those participants completed the daily diary element of the study reported here (N=229). Additionally, six participants did not complete the specific diary questions reported here and were thus removed from analyses, resulting in a final sample size of 223 (aged 21-60, $M = 40.6$; 58% female, 42% male). This sample consisted of 84% White, 6% multiple ethnicities, 3% Black or African American, 3% American Indian or Alaskan Native, 2% Asian, and 2% did not report. Due to some missing data, household income was only available for 84% of the sample: 5% <\$10,000; 15% \$10,000-30,000; 21% \$30,000-50,000; 15% \$50,000-70,000; 16% \$70,000-100,000; 12% >\$100,000.

Measures. *Entity beliefs about emotion.* Entity beliefs were measured using the Implicit Theories of Emotion Scale (Tamir et al., 2007). The scale included two items targeting entity beliefs about emotions (*No matter how hard they try, people can't really change the emotions that they have; The truth is, people have very little control over their emotions*) and two items targeting incremental beliefs about emotions that were reverse scored (e.g., *If they want to, people can change the emotions that they have; Everyone can learn to control their emotions*). Responses were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged together to create a composite ($M = 3.41$, $SD = 1.32$, $\alpha = .75$).

Daily emotion regulation. Participants completed a series of diaries each night for fourteen consecutive days. Each night, participants were guided through a series of prompts that listed different contexts in which stressful events could have occurred within the past 24 hours and were asked to identify which stressors they had experienced. At the end of this procedure, they were asked to report the most stressful event that occurred within the past 24 hours, which

could have been one of the stressors listed in the prompts or anything else that was not prompted. This guided-recall procedure was used to reduce bias in the types of events that individuals identified as most stressful event. Participants were then asked to report how much they tried to use both reappraisal and suppression as they “dealt with the stressful event that happened during the last 24 hours and [their] reactions to [that event]” on a scale of 1 (*very slightly or not at all*) to 5 (*very/a lot*). Specifically, participants responded to two reappraisal prompts (*thinking about the event in a way that would make you feel better; thinking about potential positive outcomes of the event*) and one suppression prompt (*not to show on the outside how you felt*). Because the two reappraisal prompts were highly correlated ($r = .59, p < .001$), these two items were averaged within each day. On average, participants reported moderate motivation to use reappraisal ($M = 2.77, SD = 1.33, range = 1-5$) as well as moderate motivation to use suppression ($M = 2.68, SD = 1.50, range = 1-5$).

Control variables. Three control variables were assessed to address the influence they may have on the link between entity beliefs about emotion and reappraisal, thereby testing the unique predictive validity of the entity beliefs measure: general self-efficacy (e.g., “*I can solve most problems if I invest the necessary effort*”; General Self-Efficacy Scale; Schwarzer & Jerusalem, 1995), optimism (e.g., “*In uncertain times, I usually expect the best*”; Life Orientation Test – Revised; Scheier, Carver, & Bridges, 1994) and negative emotional reactivity (e.g., “*I get stressed out easily*”; Neuroticism subscale of the International Personality Item Pool; Goldberg, 2005).

Procedure. Participants first completed an online questionnaire assessing entity beliefs about emotion as well as the control variables and then completed two weeks of daily diaries (80% of participants began the diaries within one week of the online questionnaire, 98% of participants began the diaries within one month of the online questionnaire). The above measures of daily emotion regulation were included only within the last seven days of these diaries due to the chance that simply answering questions about emotion regulation could unintentionally influence participants’ use of emotion regulation. Participants completed an average of 5.7 diaries out of 7 possible diaries. Approximately 80% of participants completed five days or more and 94% of participants completed at least three diaries. All data were retained given that even one or two days of data are informative.

Results

Using multi-level modeling, I first examined whether entity beliefs about emotions (level 2 variable) predicted daily reappraisal (level 1 variable). This model revealed that individuals with greater entity beliefs were less likely to use reappraisal on a daily basis, $B = -0.14, SE = 0.05, p = .004$. Importantly, this link held when controlling for general self-efficacy, optimism, or emotional reactivity, $Bs > -0.14, ps < .007$.

Next, I examined whether entity beliefs about emotions (level 2 variable) predicted daily suppression (level 1 variable). This model revealed that individuals with greater entity beliefs were neither more nor less likely to use suppression on a daily basis, $B = -0.06, SE = 0.05, p = .218$, and this link remained null when controlling for general self-efficacy, optimism, or emotional reactivity, $Bs < -0.08, ps > .106$.

Discussion

The results of this pilot study confirm that individuals with stronger entity beliefs about emotion were less likely to use reappraisal in daily life. The results also suggest that the link

between entity beliefs about emotion and emotion regulation may be relatively specific to strategies that focus on changing emotional experiences (e.g., reappraisal) and may not extend to other strategies (e.g., suppression). Prior research has also found evidence that entity beliefs about emotion predict less cognitive reappraisal use (and do *not* predict expressive suppression use) but this research has relied exclusively on questionnaire reports of habitual emotion regulation (e.g., Tamir et al., 2007; Schroder et al., 2014). This is first examination to provide evidence that entity beliefs about emotion predict the reduced use of reappraisal in individuals' actual day-to-day lives. Finding a link between entity beliefs and emotion regulation in every day life underscores the robustness of this link and provides crucial support for the validity of the beliefs measure: Although self-reported questionnaire measures of habitual reappraisal provide a strong foundation for the present model, the conceptual model is more strongly supported when entity beliefs predict measures of reappraisal that rely on methods that may be less influenced by common method variance and possible self-reported biases, such as daily diary assessments.

Additionally, these data provide support that the link between entity beliefs about emotion and reduced use of reappraisal is not driven by low general self-efficacy, greater pessimism about the future, or heightened negative emotional reactivity. Rather, there appears to be something unique about believing that emotions are uncontrollable that reduces individuals' likelihood of using reappraisal. Overall, this pilot study bolsters the validity of the present assessment of entity beliefs and supports the first link in the proposed model; as such, this pilot lays the groundwork for the primary hypotheses tested with Study 1 and 2.

Study 1

This study tested whether youths who believe emotions are relatively uncontrollable experienced greater levels of depressive symptoms. To examine a plausible mediator of this link, I also tested whether youths with stronger entity beliefs were less likely to use reappraisal, and whether this accounted for the link between entity beliefs and depressive symptoms. I again tested whether this mediation would be specific to reappraisal and would not extend to suppression. Finally, I tested whether youths' age or gender influenced the levels of or links between entity beliefs, emotion regulation, and depression.

Method

Participants. A sample of 136 youths was recruited as part of a larger study examining children's emotional experiences. Youths were recruited from two high schools in Pennsylvania. Informational letters about the study were given to the high school students (to take home to their parents) by research staff. These forms included a contact sheet (so parents could be contacted directly) and parental consent for their adolescent. Approximately 400 letters were distributed. Interested youths and parents returned the contact sheet and parental consent form. Youths completed an assent form before participating in the study (N=142)¹. Six participants were subsequently dropped from the analyses due to incomplete data (i.e., five participants did not complete the measure of entity beliefs about emotion and one participant did not complete the measure of emotion regulation), resulting in a final sample size of N = 136 (aged 14-18, *M* = 15.5; 39% female, 61% male). This sample consisted of 82% Caucasian, 8% African American, 2% Latino/Hispanic, 5% Asian/Island Pacific, and 3% other/multiracial participants. Parents who chose to participate (80% of the sample had at least one parent participate) reported on the family's annual household income. Due to some missing data, income was only available for

72% of the sample: 4.1% <\$40,000; 20.4% \$40,000-79,999; 21.4% \$80,000-119,999; 20.4% \$120,000-159,999; 13.2% \$160,000-199,999; 20.4% >\$200,000.

Measures. *Entity beliefs about emotion.* Youths' entity beliefs were measured using a slightly adapted version of the Implicit Theories of Emotion Scale (Tamir et al., 2007) with simpler language more appropriate for a younger sample. For example, the word "emotion" (appearing in the original scale) was replaced with the word "feelings", to make the items more intuitive for the younger sample. The scale included two items targeting entity beliefs about emotions (*No matter how hard they try, people can't really change their feelings; People have very little control over their feelings*) and two items targeting incremental beliefs about emotions that were reverse scored (e.g., *People can change their feelings if they want to; Everyone can learn to control their feelings*). Responses were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged together to create a composite. See Table 1 for all descriptive statistics.

Emotion regulation. Youths' use of emotion regulation was assessed using the validated Emotion Regulation Questionnaire for Children and Adolescents (Gullone & Taffe, 2012), an adapted version of the widely-used adult Emotion Regulation Questionnaire (Gross & John, 2003) with simpler language more appropriate for a younger sample. Use of cognitive reappraisal was measured with six items (e.g., *I control my feelings about things by changing the way I think about them*) rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged together to create a composite. Use of expressive suppression was measured with four items (e.g., *When I'm feeling bad (e.g., sad, angry, or worried), I am careful not to show it*) rated on a scale of 1 to 7 and averaged together to create a composite.

Depressive symptoms. Depressive symptoms were assessed using the Center for Epidemiological Studies – Depression scale (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986; Weissman, Orvaschel, & Padian, 1980), which contains 20 items summed together assessing the severity of various psychological, social and somatic symptoms of depression (e.g., *I felt sad*) rated on a scale of 0 (*not at all*) to 3 (*a lot*).

Procedure. Upon receiving parents' consent, research staff visited the schools to administer the surveys to the youths (either in the auditorium in a large group or in a specified classroom). At that time, participating students completed an assent form and then completed the above scales using paper and pencil. The procedure took approximately 45 minutes and students received \$20 for their participation. All procedures were approved by the Institutional Review Board at West Virginia University.

Results

Preliminary analyses. I first examined how entity beliefs, emotion regulation (reappraisal, suppression), and depressive symptoms varied within the sample by age and gender (see Table 1 for these statistics). Age was unrelated to entity beliefs, reappraisal, suppression, and depressive symptoms. These null effects may not be diagnostic, however, given the relatively limited age range in this sample. Gender was related to entity beliefs, suppression, and depressive symptoms: girls reported stronger entity beliefs than boys, girls used suppression less frequently than boys (but did not differ from boys on reappraisal), and girls reported more depressive symptoms than boys. Interactions between age and gender are not reported for Study 1 because the sample size is relatively small, the age range is relatively restricted (80% of the

same is 15 or 16 years old), and age and gender are somewhat confounded. Due to participant availability, most participants (91%) were recruited from 9th and 10th grade classrooms, but a few participants were recruited from 11th and 12th grade classrooms. These older students, however, were predominantly girls (92%).

Testing primary hypotheses. I first tested (1) whether entity beliefs were linked with depressive symptoms, (2) whether entity beliefs were linked with emotion regulation, and (3) whether emotion regulation mediated the link between entity beliefs and depressive symptoms (see Table 2 for correlations between Study 1 variables).

As predicted, entity beliefs about emotion were linked with greater depressive symptoms, $\beta = .21$, $t(134) = 2.44$, $p = .016$. Entity beliefs were also linked with less frequent use of reappraisal, $\beta = -.17$, $t(134) = 2.03$, $p = .044$, but were not significantly linked with use of suppression, $\beta = .08$, $t(134) < 1$, $p = .354$. Consistent with previous findings, reappraisal was linked with fewer depressive symptoms, $\beta = -.23$, $t(134) = 2.68$, $p = .008$. This pattern of associations laid the groundwork for reappraisal to statistically mediate the link between entity beliefs and depressive symptoms. Because entity beliefs were not linked with suppression, suppression was not a viable mediator and was not considered further.

The PROCESS macro (Hayes & Preacher, 2014) was employed to test whether the link between entity beliefs and depressive symptoms was mediated by reappraisal using bias-corrected bootstrapped confidence intervals with 5000 samples to test the indirect effects. As displayed in Table 3, this analysis verified a significant partial mediation.

Supplementary analyses. I then examined whether age or gender moderated any of the links within the proposed mediation model (i.e., between entity beliefs, reappraisal, and depressive symptoms). In the case of a significant moderation, I also examined whether the indirect effect of entity beliefs to depressive symptoms via reappraisal was moderated (i.e., a moderated mediation). I also examined two alternative mediation models. Specifically, to lend support for the hypothesis that depressive symptoms may be an *outcome* of entity beliefs and emotion regulation, I tested two reverse mediation models in which depressive symptoms were the predictor (rather than the outcome).

Age as a moderator. Age was mean-centered and multiplied by a mean-centered predictor (either entity beliefs or emotion regulation) to yield an interaction term. This interaction term and its two main effects were entered as predictors in a series of regression analyses. In these analyses, age did not moderate any the links between entity beliefs, reappraisal, or depressive symptoms, β s $< .07$, $t(130)$ s < 1 , $ps > .424$.

Gender as a moderator. Gender was entered as a fixed factor, a mean-centered predictor (either entity beliefs or reappraisal) was entered as a covariate, and the two were used to generate an interaction term in a series of univariate ANOVAs. Gender did not moderate the link between entity beliefs and depressive symptoms, $F(1, 132) < 1$, $p > .777$, $\eta_p^2 = .00$, or between entity beliefs and reappraisal, $F(1, 132) < 1$, $p = .528$, $\eta_p^2 = .00$. Gender did, however, significantly moderate the link between reappraisal and depressive symptoms, $F(1, 132) = 17.02$, $p < .001$, $\eta_p^2 = .11$, such that there was a stronger link between reappraisal and depressive symptoms for girls, $r = -.52$, $p < .001$, than for boys, $r = .03$, $p = .796$.

Moderated mediation. Taken together, these moderation analyses suggest that one path of the proposed mediation model had a significant moderator: the link between reappraisal and depressive symptoms was moderated by gender. To examine whether this moderation influenced

the indirect effect between entity beliefs and depressive symptoms via reappraisal, I conducted a moderated mediation analysis (Model 14 in the PROCESS macro). This analysis confirmed a significant omnibus moderated mediation, $index = .77$ ($SE = .46$), $CI_{95} [0.06, 1.91]$, such that the conditional indirect effect of entity beliefs to depressive symptoms through reappraisal was stronger for girls, $B = .73$ ($SE = .43$), $CI_{95} [0.05, 1.76]$, than for boys, $B = -.05$ ($SE = .11$), $CI_{95} [-0.35, 0.10]$.

Alternative mediation models. I also tested two reverse mediation models in which depressive symptoms were the predictor (rather than the outcome). In a model where depressive symptoms predicted entity beliefs via reappraisal, there was no significant indirect effect, $index = .004$ ($SE = .004$), $CI_{95} [-0.001, 0.01]$, indicating no significant mediation. In the model where depressive symptoms predicted reappraisal via entity beliefs, there was also no significant indirect effect, $index = -.003$ ($SE = .003$), $CI_{95} [-0.01, 0.001]$, indicating no significant mediation.

Discussion

The results Study 1 indicate that youths who believed emotions are relatively uncontrollable were more likely to have higher levels of depressive symptoms. This link was not moderated by age or gender, suggesting that entity beliefs consistently predicted depressive symptoms across adolescence (between the ages of 14-18), similarly for both boys and girls.

As predicted, youths who believed emotions are relatively uncontrollable were also less likely to use reappraisal, but were not less (or more) likely to use suppression. This pattern of findings suggests that entity beliefs may have unique implications for emotion regulation strategies that target the *experience* of emotions (e.g., reappraisal), but not strategies that target the *expression* of emotions (e.g., suppression).

I also found support for the proposed mediation model: Youths with stronger entity beliefs experienced greater depressive symptoms, in part because they were less likely to use reappraisal. These findings are preliminary given the cross-sectional nature of the study, but they are consistent with the theoretically-motivated model (Figure 1). An alternative model might propose the reverse directionality: that youths with more depressive symptoms may be more overwhelmed by their emotions and *as a result* would be less likely to use reappraisal and more likely to hold stronger entity beliefs about emotion. However, I did not find evidence for this reverse mediation model. As such, this study provides some preliminary support that youths' entity beliefs may shape their depressive symptoms, rather than the other way around.

While the link between emotion regulation and depressive symptoms was not the main focus of the present investigation, this link is an important component of the proposed mediation. I found that reappraisal was linked more strongly with depressive symptoms for girls than for boys. These analyses suggest that although there was a significant overall mediation where youths' entity beliefs predicted greater depressive symptoms via less reappraisal, this indirect effect may be stronger for girls than for boys. Importantly, gender did not moderate the link between entity beliefs and depressive symptoms. Taken together, these results suggest that both boys and girls experience equivalently greater depressive symptoms as a function of their entity beliefs, but reduced use of reappraisal may be a stronger mediator for girls than for boys.

Study 1 provided a promising initial test of the hypothesized model but a second study was necessary to address several important considerations. A second study allowed me to test whether the basic pattern of associations we observed in Study 1 would replicate in a second, larger sample. Additionally, the proposed model is directional but Study 1 does not support directional conclusions due to its cross-sectional design. Study 1 also relied on youth's self-

reported depressive symptoms, which could potentially inflate links with self-reported entity beliefs due to their common method. Finally, Study 1 contained a relatively restricted adolescent age range (primarily 15 and 16 year olds), which possibly limited my ability to examine age as a moderator of the present findings.

Study 2

This investigation was designed to replicate and extend Study 1 in several crucial ways. First, Study 2 employed a longitudinal design where it was possible to test whether entity beliefs about emotion predicted future levels of depressive symptoms (18 months later), even when controlling for earlier levels of depressive symptoms. This design also allowed me to test the reverse causal model wherein depressive symptoms could predict future entity beliefs. Second, in addition to youths' reports of their own depressive symptoms, I measured parent's reports of youths' depressive symptoms. Assessing parent-reported depressive symptoms provided a complementary measure of symptoms: it allowed me to test whether the model extends to an informant's report of symptoms, an index of psychological health that is less influenced by common method variance and possible self-report biases. Assessing informant-reported symptoms also reduces the chance that measures of emotion beliefs, emotion regulation, and emotional symptoms are associated due to biases in self-reported measures. To ensure that parents' own depressive symptoms did not unduly influence how they rated their children, I also controlled for parental depressive symptoms. Third, I again assessed youths' use of reappraisal and suppression and tested whether entity beliefs promoted less frequent use of reappraisal (but not suppression), and whether less frequent reappraisal accounted for the link between entity beliefs and future depressive symptoms. Finally, Study 2 provided a larger sample than Study 1 with a wider age range across childhood and adolescence that allowed me to explore how age (school grade), pubertal status, or gender might shape entity beliefs about emotions and its links with emotion regulation and psychological health.

Method

Participants. A sample of 227 youths was recruited as part of a larger study examining depression in childhood (Hankin et al., 2015). Children were recruited from the greater Denver, CO, metro area. In participating school districts, brief information letters were sent home directly to families with a child in 3rd, 6th, or 9th grade. Of the families to whom letters were sent, 508 parents responded to the letter and called the laboratory for more information. Parent report established that both the parent and youth were fluent in English, the youth did not have an autism spectrum or psychotic disorder, and the child had an IQ > 70. Of the families who initially contacted the laboratory, 366² (72% participation rate) qualified as study participants and arrived at the laboratory for the assessment. The remaining 142 were not considered participants for the following reasons: 2 (1%) were excluded because the parents reported that their child had an autism spectrum disorder or low IQ; 10 (7%) were non-English-speaking families; 94 (66%) declined after learning about the study's requirements; and 36 (25%) were scheduled but did not arrive for assessment.

I restricted all analyses to include only participants who had complete data for the primary study variables (entity beliefs assessed at the second study time point, emotion regulation assessed at the third study time point, and depressive symptoms assessed at the third study time point; see Procedure section for more details), which resulted in a final sample of $N = 227$ youths (aged 8-16 years at the beginning of the study, $M = 12.19$, 57% female, 43% male)³.

The final sample of youths consisted of 75.6% Caucasian, 4.4% African American, 3.1% Latino/Hispanic, 3.6% Asian/Island Pacific, and 13.3% other/multiracial participants. Parents reported on the family's annual household income, and these data were available for 95% of the sample. The income within those participants was as follows: 14.3% <\$40,000; 32.3% \$40,000-79,999; 29.9% \$80,00-119,999; 12.2% \$120,000-159,999; 3.8% \$160,000-199,999; 8.9% >\$200,000.

Measures. *Entity beliefs about emotion.* Youths' entity beliefs were measured using the same scale as Study 1 (Tamir et al., 2007). This scale included two items targeting entity beliefs about emotions (*No matter how hard they try, people can't really change their feelings*; *People have very little control over their feelings*) and one item targeting incremental beliefs about emotions that was reverse scored (e.g., *People can change their feelings if they want to*). Responses were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged to create a mean score. This scale originally included an additional incremental item, but because including this item reduced the reliability of the overall scale ($\alpha = .58$), the 3-item version was used in all subsequent analyses ($\alpha = .62$). See Table 4 for all descriptive statistics. Analyses using either the 3- or 4-item measure were comparable.

Emotion regulation. Youths' use of emotion regulation was assessed using an adapted version of the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) with simpler language more appropriate for a younger sample⁴ and rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Use of cognitive reappraisal was measured with six items (e.g., *When I want to feel less bad and not feel sad or angry, I change the way I'm thinking about the situation*). Use of expressive suppression was measured with four items (e.g., *When I'm feeling bad, sad, or angry, I do not show these feelings in my face or my behavior*).

Given that there is some degree of semantic overlap between the items assessing reappraisal and those assessing entity beliefs about emotion, I conducted item-level analyses within the larger sample of Study 2 to ensure that semantic overlap did not account for the link between entity beliefs and reappraisal. These analyses revealed that the correlations between the entity beliefs scale and each of the six reappraisal items were relatively modest, ranging between $r = -.11$ and $-.20$ (average $r = -.15$), suggesting that the entity beliefs scale is not redundant with the reappraisal items. The relatively tight range of these correlations further suggests that the links do not grow meaningfully stronger as a function of more vs. less semantic overlap across items. In fact, the reappraisal item with the highest semantic overlap with the entity beliefs measure, given its explicit reference to "control" and "change" (i.e., *I control my feelings by changing the way I think about the situation I'm in*) had one of the *lower* correlations with beliefs ($r = -.11$). It is also noteworthy that the suppression item with the highest semantic overlap with the entity beliefs measure (e.g., *I control my feelings by not showing them in my face or my behavior*) exhibits a near-null correlation with the entity beliefs measure ($r = -.03$), suggesting that entity beliefs and suppression are relatively unrelated despite some semantic overlap. Overall, this evidence suggests that entity beliefs and reappraisal are separable constructs and the links between these two scales are not simply driven by semantic overlap.

Depressive symptoms. Youth self-reported depressive symptoms were assessed using the Children's Depression Inventory (Kovacs, 1981), which contains 27 items summed together to assess the severity of various psychological, social and somatic symptoms of depression rated on a scale of 0 (e.g., *I am sad once in a while*) to 2 (e.g., *I am sad all of the time*). Parent-reported youths' depressive symptoms were assessed using the Child Depression Inventory - Parent

Report (CDI-PR; Wierzbicki, 1987), which consists of the same 27 items used in the child self-reported version of the CDI, but reworded so that parents reported on their child's depressive symptoms. Youths' self-reported depressive symptoms were moderately correlated with the parents' reports of the youths' symptoms at each study time point (see Table 5), indicating that the parent reports were related to but not redundant with youths' self-reports.

Because parents' reports of youths' depressive symptoms could be influenced by their own symptoms, parent self-reported depressive symptoms were also assessed using the Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996). This scale includes 21 items⁵ rated on a scale of 0 (e.g., *I do not feel sad*) to 3 (e.g., *I am so sad or unhappy that I cannot stand it*) that were summed to create a composite (T0 $M = 5.11$, $SD = 7.72$, $alpha = .88$; T1 $M = 4.23$, $SD = 6.41$, $alpha = .92$; T2 $M = 4.71$, $SD = 7.14$, $alpha = .92$). At each study time point, parents' own depressive symptoms were correlated with their informant reports of youths' symptoms, $r_s = .21-.48$, $ps < .002$, and with youths' self-reported symptoms, $r_s = .14-.24$, $ps < .037$. This pattern of results suggests that parents' own depressive symptoms could influence their reports of their child's symptoms. Thus, in the primary analyses below, I also include analyses that control for parents' depressive symptoms.

Pubertal status. Youths completed the Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988), which includes five questions about physical development, scored from 1 (no) to 4 (development complete). Reliability and validity of the PDS is high (Petersen et al., 1988; Shirlcliff, Dahl, & Pollack, 2009), as PDS scores relate significantly with physical examination for pubertal development (Shirlcliff et al., 2009). Standard PDS scoring procedure was followed to create pre-pubertal and post-pubertal groups separately for girls and boys. Youths' pubertal status was established at T1, at the same time point as the first assessment of entity beliefs about emotion.

Procedure. Youths visited the laboratory with a parent for an initial in-person assessment (T0) and returned to the lab 18 months after T0 (T1) and 36 months after T0 (T2). Youths' entity beliefs and emotion regulation were assessed only at T1 and T2 (i.e., these data were not collected at T0). Youths' self-reported and parent-reported depressive symptoms were assessed at all three time points. Parent's self-reported depressive symptoms were also assessed at all time points. All data were collected using paper-and-pencil. Parents provided informed consent for their child's participation; children also provided their own written assent. The institutional review board at the University of Denver approved all procedures. Both the youth and the parent were compensated monetarily for their participation.

Results

Preliminary analyses. I first examined how entity beliefs, emotion regulation, and depressive symptoms changed across the study time points over the course of the longitudinal study. I next tested how entity beliefs, emotion regulation, and depressive symptoms varied as a function of school grade, pubertal status, and gender (see Table 4 for means). I examined school grade rather than chronological age because participants were recruited from 3rd, 6th, or 9th grade, which created three discrete groups of participants and a tri-modal, non-normal distribution of ages across the total age range. These three discrete groups of participants were recruited to create an accelerated longitudinal design that captured time before, during, and after the pubertal transition (Hankin et al., 2015). Given this, from this point on, school grade was used as a categorical variable that corresponds very closely to age, $r = .98$, $p < .001$, but was more

statistically appropriate to examine within the present sample. Also, although youths were recruited while they were in 3rd, 6th, or 9th grade, they completed the T1 assessment of beliefs 18 months later, and are thus referred to by their T1 school grade: 4th, 7th, and 10th grade.

Correlations between and changes in entity beliefs, emotion regulation and depressive symptoms across study time points. Youths' T1 entity beliefs were moderately related to their T2 entity beliefs (see Table 5 for correlations), and there was a marginal increase in entity beliefs from T1 to T2, $F(1, 216) = 2.81, p = .095, \eta_p^2 = .013$ (see Table 4 for means). Youths' T1 reappraisal was moderately related to their T2 reappraisal, and the mean level of reappraisal did not significantly change from T1 to T2, $F(1, 226) < 1, p = .858, \eta_p^2 = .00$. Youths' T1 suppression was moderately related to their T2 suppression, and there was a significant increase in suppression from T1 to T2, $F(1, 226) = 8.07, p = .005, \eta_p^2 = .03$.

Youths' self-reported depressive symptoms were strongly related to each other at all three time points and youths' parent-reported depressive symptoms were also strongly related to each other at all three time points. Across the three study time points, depressive symptoms tended to decrease: Youths' self-reported symptoms decreased from T0 to T1, $F(1, 226) = 16.31, p < .001, \eta_p^2 = .07$, but did not change from T1 to T2, $F(1, 226) < 1, p = .648, \eta_p^2 = .00$; parent-reported youths' symptoms decreased from T0 to T1, $F(1, 224) = 13.63, p < .001, \eta_p^2 = .06$, and from T1 to T2, $F(1, 224) = 19.68, p < .001, \eta_p^2 = .08$.

School grade differences in entity beliefs, emotion regulation, and depressive symptoms. School grade was associated with entity beliefs such that the older grades reported stronger entity beliefs than the younger grades (see Table 4 for means and statistical tests). School grade was not associated with reappraisal or suppression. Consistent with prior research, school grade was associated with depressive symptoms, such that older grades reported higher symptoms than younger grades.

Pubertal status differences in entity beliefs, emotion regulation and depressive symptoms. Pubertal status was associated with entity beliefs such that post-pubertal youths reported stronger entity beliefs than pre-pubertal youths. Pubertal status was not associated with reappraisal or suppression. Consistent with prior research, pubertal status was associated with depressive symptoms, such that post-pubertal youths reported higher symptoms than pre-pubertal youths.

Gender differences in entity beliefs, emotion regulation and depressive symptoms. Gender was associated with entity beliefs such that girls reported stronger entity beliefs than boys. Consistent with prior research, gender was associated with emotion regulation such that girls used suppression less frequently than boys, but did not differ from boys in use of reappraisal. Gender was also somewhat associated with depressive symptoms such that girls reported significantly higher levels of depressive symptoms than boys, but this difference was only present at T2 (and not at T0 or T1, although the means were in the same direction). There were no gender differences in parents' reports of their children's depressive symptoms at any of the time points.

Interactions between school grade, pubertal status, gender, and study time point. I tested whether school grade, pubertal status, gender, and study time point interacted with each other to shape entity beliefs, emotion regulation, or depressive symptoms. Based on how participants were recruited, the majority (94%) of the youngest group of participants (the 3rd graders at T0) was pre-pubertal, while the majority (88%) of the oldest group of participants (the 9th graders at T0) was post-pubertal. Thus, it would not be appropriate to enter both school grade and pubertal status within the same analysis.

School grade x gender x study time point moderations. The three-way interaction between school grade and gender (as between subjects factors) and study time point (as a within-subject factor) did not predict entity beliefs, $F(2, 211) < 1, p = .374, \eta_p^2 = .01$, reappraisal, $F(2, 221) < 1, p = .543, \eta_p^2 = .01$, suppression, $F(2, 221) = 2.64, p = .074, \eta_p^2 = .02$, self-reported depressive symptoms, $F(4, 442) = 1.47, p = .211, \eta_p^2 = .01$, or parent-reported depressive symptoms, $F(4, 438) = 1.42, p = .227, \eta_p^2 = .01$. There were also no significant subordinate two-way interactions, all, $F(2, 438)s = 1.37, ps > .256, \eta_p^2s < .01$.

Pubertal status x gender x study time point moderations. The three-way interaction between pubertal status and gender (as between subjects factors) and study time point (as a within-subject factor) did not predict entity beliefs, $F(1, 209) < 1, p = .336, \eta_p^2 = .00$, reappraisal, $F(1, 219) < 1, p = .351, \eta_p^2 = .00$, suppression, $F(1, 219) < 1, p = .978, \eta_p^2 = .00$, self-reported depressive symptoms, $F(2, 438) = 1.68, p = .188, \eta_p^2 = .01$, or parent-reported depressive symptoms, $F(2, 434) < 1, p = .473, \eta_p^2 = .00$. There were also no significant subordinate two-way interactions, $F(1, 219)s < 1.16$, all $ps > .283, \eta_p^2s < .01$.

Exploratory analyses of developmental differences in entity beliefs. The design of study 2 allowed me to tease apart the possible separate influences of age (school grade) and puberty on youths' entity beliefs. Specifically, while the majority of the 4th graders were pre-pubertal and the majority of the 10th graders were post-pubertal, there was a split within the 7th graders: about half were pre-pubertal and half were post-pubertal. This distribution allowed me to compare entity beliefs in youths who were different ages but had the same pubertal status (i.e., pre-pubertal 4th vs. 7th graders; post-pubertal 7th vs. 10th graders) with youths who were the same age but had a different pubertal status (i.e., pre-pubertal 7th graders vs. post-pubertal 7th graders). The pre-pubertal 4th and 7th graders did not differ in their T1 entity beliefs ($M = 2.68$ vs. 2.91), $p = .435$, *Cohen's d* = .17, and the post-pubertal 7th and 10th graders did not differ in their T1 entity beliefs ($M = 3.35$ vs. 3.47), $p = .601$, *Cohen's d* = .11. However, the difference between the comparably-aged pre-pubertal 7th graders and their post-pubertal 7th-grade peers was marginally significant ($M = 2.91$ vs. 3.35) $p = .103$, *Cohen's d* = .36. Given that the effect was only marginal, it should be interpreted with caution. The effect size of the pubertal difference, however, was 2-3 times larger (.36) than the effect size for the age difference (.17, .11).

Testing primary hypotheses. Plan of analysis. As displayed in Figure 1, the model proposes that (1) youths with stronger entity beliefs will experience greater future depressive symptoms, (2) youths with stronger entity beliefs will be less likely to use reappraisal in the future, and (3) emotion regulation will account for the link between entity beliefs and future depressive symptoms. Thus, in the primary analyses, I examined (1) how the first assessment of youths' entity beliefs at T1 predicted their future depressive symptoms at T2, (2) how the first assessment of entity beliefs at T1 predicted future emotion regulation at T2, and (3) whether future emotion regulation at T2 accounted for the link between T1 entity beliefs and T2 depressive symptoms.

I also tested whether the link between T1 entity beliefs and T2 depressive symptoms was prospective in nature (i.e., held when controlling for earlier assessments of depressive symptoms). To do this, for both self reports and parent reports, I examined T2 depressive symptoms residualizing out the influence of T0 depressive symptoms or residualizing out the influence of T1 depressive symptoms. I also controlled for the possible confounding influence of parents' own depressive symptoms by residualizing out their own depressive symptoms from their reports of their children's symptoms within each time point.

Thus, in the subsequent analyses, I was able to test the robustness of the model by examining T2 depressive symptoms in multiple ways (1) T2 self-reported depressive symptoms, (2) T2 self-reported depressive symptoms, controlling for T0 self-reported symptoms, (3) T2 self-reported depressive symptoms, controlling for T1 self-reported symptoms (4) T2 parent-reported depressive symptoms, (5) T2 parent-reported depressive symptoms, controlling for T0 parent-reported symptoms, (6) T2 parent-reported depressive symptoms, controlling for T1 parent-reported symptoms, (7) T2 parent-reported depressive symptoms from analyses 4, 5, and 6, also controlling for parents' own depressive symptoms.

Entity beliefs and depressive symptoms. As hypothesized, youths' T1 entity beliefs predicted greater T2 self-reported depressive symptoms, $\beta = .19$, $t(225) = 2.83$, $p = .005$. Importantly, this link held when controlling for T0 depressive symptoms in a prospective analysis, $\beta = .15$, $t(225) = 2.27$, $p = .024$. This link was weakened when controlling for T1 depressive symptoms, $\beta = .07$, $t(225) = 1.11$, $p = .270$, perhaps due to the strong correlation between T1 and T2 depressive symptoms, $r = .63$.

Also as predicted, T1 entity beliefs predicted T2 parent-reported youths' depressive symptoms, $\beta = .19$, $t(225) = 2.87$, $p = .005$. This link also held when controlling for T0 depressive symptoms in a prospective analysis, $\beta = .19$, $t(225) = 2.94$, $p = .004$, and when controlling for T1 depressive symptoms in a prospective analysis, $\beta = .15$, $t(223) = 2.18$, $p = .030$. All links between T1 entity beliefs and T2 parent-reported youths' depressive symptoms also held when controlling for parents' own depressive symptoms, $\beta_s > .15$, $t(116)s > 2.20$, $ps < .028$.

Entity beliefs and emotion regulation. As hypothesized, T1 entity beliefs predicted less frequent T2 reappraisal, $\beta = -.19$, $t(225) = 2.89$, $p = .004$, but did not predict T2 suppression, $\beta = .06$, $t(225) < 1$, $p = .370$.

Entity beliefs and depressive symptoms: Mediated by reappraisal. T2 reappraisal was linked with fewer T2 self-reported depressive symptoms, $\beta = -.37$, $t(225) = 6.02$, $p < .001$, and fewer T2 parent-reported depressive symptoms, $\beta = -.30$, $t(225) = 4.67$, $p < .001$, even when controlling for parents' own depressive symptoms, $\beta = -.30$, $t(221) = 4.73$, $p < .001$. This pattern of associations laid the groundwork for reappraisal to mediate the link between entity beliefs and depressive symptoms. Because entity beliefs were not linked with suppression, suppression was not a viable mediator and was not considered further.

The PROCESS macro (Hayes & Preacher, 2014) was employed to test this mediation using bias-corrected bootstrapped confidence intervals with 5000 samples to test the indirect effects. As displayed in Table 3, these analyses verified that T2 reappraisal significantly mediated the link between T1 entity beliefs and all measures of T2 depressive symptoms: T2 self-reported depressive symptoms, T2 self-reported depressive symptoms controlling for T0 or T1 self-reported symptoms, T2 parent-reported depressive symptoms, and T2 parent-reported depressive symptoms controlling for T0 or T1 parent-reported symptoms. The mediations that included T2 parent-reported depressive symptoms also remained significant when controlling for parents' own depressive symptoms.

Supplementary analyses. I then examined whether school grade, pubertal status, or gender moderated any of the links within the mediation model (i.e., between T1 entity beliefs, T2 reappraisal, and T2 depressive symptoms). In these analyses, school grade (or pubertal status or gender) was entered as a fixed factor, a mean-centered predictor (either entity beliefs or reappraisal) was entered as a covariate, and the two were used to generate an interaction term in

a series of univariate ANOVAs. In the case of a significant moderation, I also examined whether the indirect effect of entity beliefs to depressive symptoms via reappraisal was moderated (i.e., a moderated mediation).

I then examined an alternative directional model. Although I hypothesized – and found supportive evidence – that youths’ entity beliefs predicted their future depressive symptoms, the present longitudinal dataset also allowed me to examine the reverse directionality. Specifically, I tested whether youths’ depressive symptoms predicted their future entity beliefs about emotion. To lend additional support to the hypothesis that depressive symptoms are an important outcome of entity beliefs via an indirect effect through reappraisal, I also tested two reverse mediation models in which depressive symptoms were the predictor (rather than the outcome).

School grade as a moderator. As summarized in Table 6, school grade did not moderate the link between T1 entity beliefs and any measure of T2 depressive symptoms, or the link between T1 entity beliefs and T2 reappraisal. School grade also did not moderate the link between T2 reappraisal and T2 *self*-reported depressive symptoms. While school grade did moderate links between T2 reappraisal and T2 *parent*-reported depressive symptoms, these links did not hold when controlling for parents’ own depressive symptoms.

Pubertal status as a moderator. Pubertal status did not moderate the link between T1 entity beliefs and any measure of T2 depressive symptoms, or the link between T1 entity beliefs and T2 reappraisal. Although pubertal status did not consistently moderate the link between T2 reappraisal and T2 *self*-reported depressive symptoms, it did significantly moderate all measures of T2 *parent*-reported depressive symptoms. Across these analyses, post-pubertal youths had a stronger link between reappraisal and depressive symptoms, compared to pre-pubertal youths. Given this moderation, below in the “Moderated Mediation” section, I tested whether pubertal status significantly moderated the mediation of entity beliefs to parent-reported depressive symptoms via reappraisal.

Gender as a moderator. Gender did not moderate the link between T1 entity beliefs and any measure of T2 depressive symptoms, or between T1 entity beliefs and T2 reappraisal. Consistent with Study 1, gender significantly moderated the link between T2 reappraisal and T2 self-reported depressive symptoms, such that the link was stronger for girls than for boys. In prospective analyses, this moderation held when controlling for T0 self-reported depressive symptoms (although not when controlling for T1 self-reported depressive symptoms). Although gender did not moderate the link between T2 reappraisal and T2 *parent*-reported depression, gender consistently moderated the link between reappraisal and *self*-reported depressive symptoms (including within Study 1). Thus, below in the “Moderated Mediation” section, I tested whether gender significantly moderated the mediation of entity beliefs to self-reported depressive symptoms via reappraisal.

Interactions between pubertal status and gender as moderators. I also tested whether pubertal status and gender interacted to shape the links between entity beliefs, reappraisal, and depressive symptoms. I focused on the interaction between pubertal status and gender (and not on the interaction between school grade and gender) for two reasons. Theoretically, both pubertal status and the selected school grades (4th, 7th, and 10th) reflect a comparable developmental change and should yield similar patterns. Practically, testing whether the links in the model are moderated by the interaction between pubertal status (pre-pubertal, post-pubertal) and gender (girl, boy) creates four moderately sized subgroups of participants (average $n = 56$) in which it is possible to examine differences in the size of the correlation between the variables. In contrast, the interaction between school grade and gender creates six relatively small subgroups (average

$n = 38$). Given that these moderation analyses are exploratory in nature, the larger cell sizes afforded by the pubertal status-by-gender interaction provide more confidence in the interpretation of results.

Pubertal status and gender were entered as fixed factors, a mean-centered predictor (either entity beliefs or reappraisal) was entered as a covariate, and the three were used to generate a 3-way interaction term as well as the subordinate 2-way interaction terms in a series of univariate ANOVAs. In these analyses, there were no significant 3-way interactions between pubertal status, gender, and T1 entity beliefs in predicting any of the measures of T2 depressive symptoms, or in predicting T2 reappraisal. There were also no significant interactions between pubertal status, gender, and T2 reappraisal in predicting any of the measures of T2 depressive symptoms (see Table 6 for statistics).

Moderated mediation. Taken together, these moderation analyses suggest that one path of the proposed mediation model – the link between reappraisal and depressive symptoms – was moderated by other factors. First, the link between reappraisal and *self*-reported depressive symptoms appeared to be moderated by gender. Second, the link between reappraisal and *parent*-reported depressive symptoms appeared to be moderated by pubertal status.

To examine whether the indirect effect between entity beliefs and self-reported depressive symptoms via reappraisal was moderated by gender, I conducted a moderated mediation analysis (Model 14 in the PROCESS macro). This analysis confirmed a significant omnibus moderated mediation, $index = .25$ ($SE = .13$), CI_{95} [0.05, 0.59], such that the conditional indirect effect of entity beliefs to depressive symptoms via reappraisal was stronger for girls, $B = .37$ ($SE = .17$), CI_{95} [0.09, 0.73], than for boys, $B = 0.12$ ($SE = .08$), CI_{95} [0.01, 0.34]. This analysis remained significant when also controlling for T0 self-reported symptoms in a prospective analysis, $index = .04$ ($SE = .02$), CI_{95} [0.01, 0.10], though not when controlling for T1 self-reported symptoms in a prospective analysis, $index = .02$ ($SE = .02$), CI_{95} [-0.004, 0.07].

To examine whether the indirect effect between entity beliefs and parent-reported depressive symptoms via reappraisal was moderated by pubertal status, I conducted another moderated mediation analysis. Within this analysis, the omnibus moderated mediation was not significant, $index = .16$ ($SE = .15$), CI_{95} [-0.03, 0.55], indicating that pubertal status did not moderate the indirect effect of entity beliefs to parent-reported depressive symptoms via reappraisal.

Alternative directional model. I also tested the alternative directional model wherein depressive symptoms predicted future entity beliefs (rather than beliefs predicting future symptoms, reported above). Although T1 self-reported depressive symptoms predicted T2 entity beliefs, $\beta = .18$, $t(215) = 2.75$, $p = .007$, this link was not prospective and did not hold when controlling T1 entity beliefs, $\beta = .12$, $t(215) = 1.71$, $p = .089$. T1 parent-reported depressive symptoms also predicted T2 entity beliefs, $\beta = .15$, $t(213) = 2.27$, $p = .024$, but this link was also not prospective and did not hold when controlling for T1 entity beliefs, $\beta = .12$, $t(213) = 1.78$, $p = .076$, and did not hold when additionally controlling for parents' own depressive symptoms, $\beta = .09$, $t(211) = 1.29$, $p = .198$.

Thus, none of the prospective links between depressive symptoms and future entity beliefs (controlling for earlier entity beliefs) were significant, lending support for the directional model proposed in Figure 1. In this model, I also proposed there would be an indirect effect between entity beliefs and greater future depressive symptoms via emotion regulation because entity beliefs discourage the use of effective strategies like reappraisal. To further rule out the reverse directional indirect effect, I tested whether T2 entity beliefs (controlling for T1 entity

beliefs in a prospective analysis) were predicted by prior experiences of T1 depressive symptoms, and whether this link was mediated by prior infrequent use of reappraisal at T1. When considering T1 self-reported symptoms of depressive symptoms as the predictor, the mediation was non-significant, *indirect effect* $B = -.001$ ($SE = .01$), $CI_{95} [-0.01, 0.01]$. When considering T1 parent-reported symptoms of depressive symptoms as the predictor, the mediation was also non-significant, *indirect effect* $B = .001$ ($SE = .002$), $CI_{95} [-0.002, 0.01]$, and remained non-significant when additionally controlling for parents' own depressive symptoms, $B = .005$ ($SE = .01$), $CI_{95} [-0.02, 0.04]$.

Discussion

Extending the cross-sectional findings from Study 1, the present study provides longitudinal and prospective evidence that youths' entity beliefs promote worse depressive symptoms over time. Even when controlling for initial depressive symptoms, youths with stronger entity beliefs experienced more depressive symptoms 18 months in the future. This pattern suggests that youths' entity beliefs about emotion may play a role in shaping their psychological health. The prospective effect of entity beliefs on depressive symptoms was not moderated by age (school grade), pubertal status, or gender, suggesting that entity beliefs consistently predicted depressive symptoms across these youths' development (between the ages of 10-18) similarly for both boys and girls.

The longitudinal design of Study 2 provided both a test of the primary hypothesis that entity beliefs predict depressive symptoms, as well as a test of the reverse directionality. Although it is plausible that higher depressive symptoms may contribute to stronger entity beliefs, I did not find compelling evidence for a prospective link between depressive symptoms and future entity beliefs. These analyses suggest that entity beliefs about emotions could be a risk factor for worse psychological health, and are not merely an outcome of worse psychological health.

Extending the results obtained for self-reported depressive symptoms in Study 1, I also assessed an informant's report of youths' depressive symptoms (i.e., one of their parents). The youths' self-reported depressive symptoms were linked with – but far from redundant with – the parent reports of youths' depressive symptoms ($r_s = .34-.46$). Thus, these two reports provide a complementary perspective on youths' symptoms. Importantly, whether I examined self reports or parent reports, I observed the same pattern: youths' entity beliefs prospectively predicted depressive symptoms. These parallel findings support the robustness of the link between entity beliefs and depressive symptoms. Also, the fact that youths' self-reported entity beliefs predicted an informant's report of depressive symptoms provides further evidence for the validity of the assessment of beliefs: entity beliefs predict measures of depressive symptoms that are unlikely to be influenced by common method variance and possible self-reported biases. In other words, beliefs do not simply predict depressive symptoms because self-reported measures predict other self-reported measures.

The results from the informant reports of youths' depressive symptoms are further strengthened by controlling for the informants' own depressive symptoms: Parents' own symptoms represent a possible confound if these symptoms bias their ratings of their child's symptoms (even if parents' own symptoms also contribute to the child's true symptoms). Compared to the relatively modest link between parents' self-reported symptoms and their child's self-reported symptoms ($r_s = .14-.24$ across the three time points), there was a relatively stronger link between parents' self-reported symptoms and their informant reports of their child's

symptoms ($r_s = .21-.48$), suggesting that parents' own symptoms biased their ratings of their child's symptoms. Importantly, when controlling for parents' depressive symptoms, the link between entity beliefs and parent-reported depressive symptoms remained unchanged. Thus, while parents' depressive symptoms likely influence their children, parental symptoms do not account for the links between youths' entity beliefs and youths' depressive symptoms.

Finally, consistent with the cross-sectional mediation from Study 1, the longitudinal mediation within Study 2 lends support for the proposed mechanistic model: Youths with stronger entity beliefs experienced greater depressive symptoms in the future because they were less likely to use reappraisal in the future. These mediations were significant for both self- and parent-reported symptoms and when controlling for earlier assessments of symptoms or not (see Table 3). Notably, I did not find evidence for the reverse indirect effect wherein depressive symptoms predicted stronger entity beliefs in the future via less frequent use of reappraisal. Rather, the present results provided consistent support for the conceptual model depicted in Figure 1, wherein entity beliefs predicted less frequent use of reappraisal in the future, which in turn, accounted for greater future depressive symptoms.

General Discussion

As humans, we have the unique capacity to think and theorize about our experiences, including our emotions. We develop theories about the nature and function of emotions, and these theories are likely to be consequential. In the present investigation, I focused on one particularly fundamental belief: whether emotions are seen as relatively controllable or uncontrollable. I proposed that believing emotions are uncontrollable (*entity beliefs*) may contribute to worse psychological health because these beliefs reduce individuals' attempts to regulate their emotions. Because this model may hold particular relevance in youth, when these beliefs are first developing and when cognitive risk factors – like maladaptive beliefs about emotion – can shape psychological health in key ways, I tested the hypothesized model in two samples of youths. This investigation allowed me to test whether entity beliefs about emotion set children and adolescents on a maladaptive trajectory, contributing to the reduced use of emotion regulation and, in turn, to worse psychological health

Entity Beliefs about Emotion: Measurement and Effects of Development and Gender

The present studies provide valuable information about the reliability and validity of assessing entity beliefs, as well as how they change across childhood and adolescence and vary as a function of gender.

First, the present studies suggest that entity beliefs are reliable within individuals over time. The longitudinal design of Study 2 provided an opportunity to examine the relative malleability versus stability of these entity beliefs: When looking at the full sample of youths, the test-retest correlation between T1 entity beliefs and T2 entity beliefs assessed 18 months later was moderate ($r = .37$). When examining the three age groups separately, the test-retest correlation remained relatively consistent ($r = .37$ for 4th graders who become 6th graders; $r = .29$ for 7th graders who become 9th graders; $r = .41$ for 10th graders who become 12th graders). These findings indicate that entity beliefs emerge and remain comparably stable within youths across 4th through 12th grade. These beliefs, however, were not *highly* stable across time, suggesting that they are not rigid or 'locked-in'; rather, they may be amendable to interventions, perhaps even brief or subtle interventions.

Second, the current investigation also provided a unique opportunity to confirm the validity of the present beliefs measure. Entity beliefs are abstract beliefs about how the world works, and as such, they should be primarily accessible via self report (vs. observable behaviors). Although there may not be a clear behavioral criterion of beliefs, it is still possible to further validate measures of beliefs by observing the downstream consequences of those beliefs, ideally with assessments other than self-reported questionnaires. To my knowledge, only one other study has assessed an outcome of individuals' entity beliefs about emotion that did not rely on a self-reported questionnaire: Tamir et al. (2007) found that entity beliefs about emotion predicted both self-reported and *peer-reported* depressive symptoms. In light of this very sparse evidence, the present investigation makes two important contributions to validating the entity beliefs about emotion scale: (a) Entity beliefs predicted not only the reappraisal people say they use in questionnaires but, in the Pilot Study, they also predicted the reappraisal people actually used in daily life and (b) entity beliefs predicted not only youths' self-reported depressive symptoms but in Study 2, they also predicted youths' *parent-reported* depressive symptoms. When entity beliefs predict outcomes assessed in every day life or outcomes that are observable by others, it suggests that those links are not due merely to a questionnaire-based self-report bias and provides additional support for the validity of the measure. Together, these findings support the validity of the present measures as well as the robustness of the overall pattern of results.

Third, the present investigation revealed consistent age-related differences in entity beliefs both within individuals over time and across individuals of different age groups. Specifically, entity beliefs became stronger as children aged, increasing marginally as the participants grew 18 months older over the course of Study 2 (rising from $M=3.10$ to 3.27). Entity beliefs were also significantly higher in the older (vs. younger) school grades and were higher in post-pubertal (vs. pre-pubertal) youths. Overall, the pattern of findings suggests that entity beliefs begin relatively low in 4th graders ($M = 2.68$ on a 1-7 scale) and rise by nearly a full scale-point across adolescence ($M = 3.60$ in 12th graders). Interestingly, the pilot study suggests that entity beliefs may remain relatively stable after youth, given that the Pilot Study adults' average level of entity beliefs ($M = 3.41$) was comparable to the 12th graders' entity beliefs.

Study 2 also provided a unique opportunity to tease apart the possible separate influences of age (school grade) and pubertal status on youths' entity beliefs. Specifically, while entity beliefs did not differ across pre-pubertal 4th and 7th graders or across post-pubertal 7th and 10th graders, entity beliefs were marginally higher in post-pubertal 7th-graders compared to their comparably-aged pre-pubertal 7th grade peers. This pattern suggests that the upward shift in entity beliefs for youths may be linked more strongly with puberty than with age. Although I did not observe age differences in entity beliefs in Study 1, these analyses were likely limited by Study 1's relatively small age range (largely 14-16 year olds) and the likelihood that most of these youths had already undergone puberty.

Finally, in addition to the age difference in entity beliefs, the youth studies revealed a consistent gender difference (see also Schleider & Weisz, 2016) with girls reporting stronger entity beliefs than boys. One explanation for this finding is that both gender and entity beliefs are confounded with depressive symptoms and the gender difference in beliefs might be simply due to the gender difference in depressive symptoms. However, when controlling for depressive symptoms when testing for gender differences in entity beliefs, the gender difference is still observed in Study 1 ($p = .051$, $\eta_p^2 = .03$) and in Study 2 (T1 $p = .004$, $\eta_p^2 = .04$; T2 $p = .040$, $\eta_p^2 = .02$). Thus, gender differences in depressive symptoms do not appear to explain the gender difference in entity beliefs.

This gender difference could also be explained by early gender socialization. Girls may be socialized toward a more essentialized view of emotions such that they are taught emotions are “natural” for females (the time worn “*women are emotional*” trope). When we believe something is natural and essential, perhaps we are less likely to believe it is controllable. Boys may also be socialized to believe that emotions should be controlled (“*boys don't cry*” is essentially a command to control emotions). When someone receives enough messages that something should be controlled, they may internalize a belief that it is possible to control it. These ideas will be important to explore more systematically in future studies. Future replications will be particularly important because although this gender difference was also observed in one of the two previously-published youth samples (Schleider & Weisz, 2016), it was not observed in the second youth sample (Romero et al., 2014). It has additionally not been observed in adult samples (e.g., Tamir et al., 2007), nor did we observe it in the present pilot study that employed an adult sample from a wide age range (*gender difference* $t(221) < 1, p = .865$). Thus, it is an open question whether females are particularly susceptible to higher levels of entity beliefs.

Entity Beliefs about Emotion and Depressive Symptoms

Establishing that young children do, in fact, hold abstract beliefs about the controllability of emotions sets the stage for measuring how these beliefs are linked with youths’ psychological health. Across both studies, I found support for my primary prediction: youths who believed emotions are relatively uncontrollable experienced greater levels of depressive symptoms, whether those symptoms were assessed cross-sectionally, longitudinally, via self report, or via informant report. Importantly, entity beliefs also prospectively predicted greater depressive symptoms 18 months later, even when controlling for earlier assessments of symptoms. And while I found relatively consistent evidence that entity beliefs prospectively predicted future levels of depressive symptoms, I found no consistent evidence that depressive symptoms prospectively predicted future entity beliefs. Thus, these results provide preliminary evidence for the directional model proposed in Figure 1 – that youths’ beliefs about emotion are a predictor of psychological health.

Only one other study reported prospective analyses between entity beliefs and psychological health (i.e., controlling for earlier levels of psychological health), and this study did not find a link between entity beliefs and prospective psychological health (Schleider & Weisz, in press). This study could represent an important caveat of controlling for initial levels of psychological health: if initial levels of psychological health are highly correlated with later levels of psychological health – as might be the case if the two assessments are relatively close together in time – the strong link between the same construct measured twice can overshadow other meaningful predictors included in the model. In this previously published study, the two time points occurred four months apart and the correlation between initial levels and later levels of psychological health was quite strong ($r = .75$). As a result, statistically controlling for initial levels of psychological health could have prevented researchers from identifying other meaningful predictors of later psychological health, including entity beliefs about emotion. These previously published prospective results are thus difficult to interpret. It is likely, however, that the longitudinal time frame of the current Study 2 – 18 or 36 months, depending on the analysis – was long enough to ensure that initial levels of psychological health were not redundant with later levels of psychological health. The average correlation between T0 or T1 depressive symptoms with T2 symptoms was strong ($r = .51$) but not so strong that it absorbed

all the meaningful predictive power. Overall, prospective analyses are an important tool that can begin to point towards directional links between variables. But, results from prospective analyses can be misleading (e.g., suggesting there is no predictive power of entity beliefs) if researchers control for earlier assessments of the outcome that are nearly redundant with the outcome.

In the present studies, the link between entity beliefs and depressive symptoms was not moderated by developmental status (e.g., age, school grade, pubertal status) or gender, suggesting that entity beliefs consistently predict symptoms across adolescent development (10-18 years old) for both boys and girls. These findings are consistent with one of the published studies assessing youths' entity beliefs, which also found that age and gender did not moderate the link between entity beliefs and depressive symptoms (Romero et al., 2014). These findings are in contrast, however, with only one of the other two studies of youths' entity beliefs, which found that the link between entity beliefs and psychological health was stronger for girls than for boys (Schleider & Weisz, 2016). Although conceptually plausible, these results are difficult to interpret because they are based on a relatively small sample of boys ($n = 28$) and girls ($n = 31$). The youth study that did not find this gender moderation used a relatively larger sample (boys $n = 48$, girls $n = 67$) and the present investigation also found no evidence for gender as a moderator within two larger samples (combined $N = 363$; girls $n = 183$, boys $n = 180$). Taken together, these findings suggest that the link between entity beliefs and psychological health could be relatively consistent for males and females.

Interpreting these results within the context of other researchers' findings, it appears that entity beliefs consistently and longitudinally predict greater depression from childhood through at least freshmen year in college. Indeed, in one study (Tamir et al., 2007), incoming college freshmen's entity beliefs longitudinally predicted their depressive symptoms at the end of their spring semester to a similar degree ($r = .15, p < .05$) as the longitudinal correlation observed within the present youth sample ($r = .19, p < .05$). In sum, entity beliefs appear to emerge early in childhood and predict greater levels of depressive symptoms in a relatively stable way across childhood, adolescence, and emerging adulthood.

There is also evidence that entity beliefs about emotion (vs. entity beliefs in other domains, like intelligence) may be specifically linked to psychological health outcomes like depression (vs. outcomes in other domains, like academic functioning). First, prior research suggests that entity beliefs about emotion are not strongly linked with other entity beliefs (e.g., about intelligence). In the three adult samples that assessed entity beliefs about emotion and intelligence, the link between entity beliefs about emotion and entity beliefs about intelligence was relatively small ($r_s = .13$ and $.10$ in Schroder et al., 2014; $r = .27$ in Tamir et al., 2007). In an additional sample of youths, the link between entity beliefs about emotion and entity beliefs about intelligence was moderate, but not so large to suggest that these two measures are redundant ($r = .43$ in Romero et al., 2012). Perhaps more importantly, these studies also suggest that the links between entity beliefs and depressive symptoms are specific to entity beliefs about *emotion*: in a longitudinal study of youths, entity beliefs about emotion – but not entity beliefs about intelligence – predicted greater depressive symptoms several months later, while entity beliefs about intelligence – but not entity beliefs about emotion – predicted worse academic outcomes (Romero et al., 2012). Overall, this pattern suggests that entity beliefs about different attributes are separable and their effects are domain specific (e.g., Hughes, 2015).

Finally, it is worth noting that while there is a consistent link between entity beliefs and greater depressive symptoms both within the present studies and across others' studies (De Castella et al., 2013; Romero et al., 2014; Schroder et al., 2015; Tamir et al., 2007), this link

sometimes has relatively small effect sizes, especially when the assessment of beliefs and depressive symptoms are 1.5 years apart. That being said, even small effect sizes – when they are consistent – can exert important cumulative effects. Moreover, depression is complex and multiply determined and one would not expect a single cognitive risk factor to explain most – or even much – of the variance in depressive symptoms. The model tested in the present investigation also did not predict there would be a strong *direct* link between individuals' abstract beliefs about emotion and their downstream psychological health. Rather, this link should be indirect in nature, via key mediating processes. Here, I made the case for the mediating role of emotion regulation processes and found evidence for a robust indirect link from entity beliefs to depressive symptoms via decreased use of reappraisal.

Entity Beliefs about Emotion and Emotion Regulation

Because entity beliefs concern the control of emotional experiences, stronger entity beliefs should reduce individuals' attempts to use emotion regulation strategies that target controlling emotional experiences (e.g., reappraisal), but not necessarily other strategies (e.g., suppression). Across both youth studies, as predicted, children who believed emotions were relatively uncontrollable were also less likely to use reappraisal, but were not less (or more) likely to use suppression. These results add to a broader literature on self-regulation and specifically, to the growing set of findings suggesting that people engage in self-regulation when they are motivated to do so (Inzlicht & Schmeichel, 2012) and believe it is possible to do so (Job, Dweck, & Walton, 2010).

Finding that entity beliefs were linked with less frequent reappraisal 18 months later also underscores the cumulative effect these beliefs may have. Children with stronger entity beliefs will likely miss many opportunities to use reappraisal, losing valuable chances to practice and gain skill in this important emotion regulation strategy. These children may even be less likely to learn reappraisal in the first place, setting the stage for worse downstream outcomes. Specifically, reappraisal has been considered a foundational emotion regulation strategy, central to several prominent empirically-supported therapies (e.g., Cognitive Behavioral Therapy) and reliably linked with psychological health (see Aldao et al., 2010 for meta-analysis). Reappraisal has also been shown to predict lower levels of depressive symptoms in children (Gullone & Taffe, 2012). Overall, reappraisal is an important strategy and there is good reason to hypothesize that children who do not use it will experience worse psychological as a result.

In the current investigation, youths who used reappraisal less frequently did, indeed, experience greater levels of depressive symptoms measured both with self reports and informant reports. I also found support for the proposed mediation model: Youths with stronger entity beliefs were less likely to use reappraisal and in turn, experienced greater depressive symptoms. I found evidence for this statistical mediation model in cross-sectional analyses, longitudinal analyses, and prospective analyses. I also did *not* find evidence for the reverse mediation model wherein early depressive symptoms predicted stronger entity beliefs via less frequent use of reappraisal. Rather, the present results provided consistent support for the conceptual model (Figure 1) wherein earlier entity beliefs predicted less frequent use of reappraisal in the future, which in turn, often fully accounted for greater future depressive symptoms. While experimental evidence is necessary to confirm the directionality of this model, the present cross-lagged results are compelling non-experimental support for the model.

The results of the present pilot study additionally suggest that the link between entity beliefs and reappraisal is not merely due to entity beliefs reflecting a general sense of low self-

efficacy, pessimism about the future, or heightened negative emotional reactivity. While future research should also rule out these alternative explanations within youth samples, there is preliminary evidence that individuals' entity beliefs about emotion specifically shape their use of emotion regulation in important – and possibly detrimental – ways.

Gender Difference in the Link between Reappraisal and Depression

Examining the basic link between emotion regulation and depressive symptoms in children was not the main focus of the present investigation, but this link was an important component of the proposed mediation. In both studies, I found that while there was an overall link between lower reappraisal and greater depressive symptoms, this link was moderated by gender such that it was stronger for girls (vs. boys). Although this moderation is consistent with some adult findings (Duarte, Matos, & Marques, 2015; Kelly, Tyrka, Price, & Carpenter, 2008), it is inconsistent with a recent well-powered youth study that found no evidence of gender moderating the link between reappraisal and depressive symptoms (Gullone & Taffe, 2012).

Theoretically, what might account for a stronger link between reappraisal and depressive symptoms for girls? Differences between girls' and boys' social environments may offer one explanation: it may be particularly important for individuals who tend to experience relatively less power and control over their environment to learn to adapt themselves – and their emotions – to their environments (Chen & Miller, 2012). Individuals with relatively less control over their environments (e.g., girls; Nolen-Hoeksema, 2001) may thus be particularly likely to benefit from using strategies like reappraisal, compared to individuals who have more control over their environment (e.g., boys) (see Troy, Shallcross, & Mauss, 2013). It is worth mentioning, however, that this gender moderation was only present for *self-reported* depressive symptoms, and not for the parent-reported symptoms. According to parent reports, reappraisal was equivalently linked with lower levels of depressive symptoms for both boys and girls. Future research would benefit from considering informant-reports of psychological health to test whether there is a robust gender difference in the link between reappraisal and psychological health.

Practical Implications

Practically, the present findings have strong implications for prevention and intervention efforts. The proposed model highlights entity beliefs about emotion as a precursor – and thus possible risk factor – to worse psychological health. These beliefs appear to be further 'up-stream' than the more proximal emotion regulation processes that act as the mechanism. Targeting these more distal beliefs could thus provide an important benefit: by targeting up-stream factors and influencing earlier stages in this risk cascade, intervention efforts can have a more lasting influence. For example, teaching someone about reappraisal may not take root unless that person also believes that emotions are amenable to control through emotion regulation in the first place. Thus, changing individuals' beliefs about emotion may represent a critical precondition to the successful development of a healthy emotion regulation repertoire.

It is also possible that targeting these beliefs in young children may be particularly fruitful. It may be easier to change entity beliefs when they are first emerging, in childhood. Additionally, because younger (vs. older) children appear to be more optimistic about the controllability of emotions, it may be beneficial to work with young children to keep their entity beliefs about emotion low: it should be easier to prevent the increase in entity beliefs that occurs during adolescence than correct entity beliefs once they are already elevated. Given the strong

links between childhood psychological health and adult psychological health, improving entity beliefs in childhood could have considerable cumulative benefits.

Some preliminary evidence speaks to the risk conveyed by entity beliefs, and the rewards provided by changing these beliefs. Specifically, one study found that adults with stronger entity beliefs were less likely to want to try talk therapy (vs. pharmacology) (Schroder et al., 2015). Thus, entity beliefs about emotion may not only worsen psychological health, but they may also shape how individuals seek help to improve their health, steering them away from effective forms of treatment where they could learn strategies like reappraisal.

Although entity beliefs about emotions are a strong candidate for intervention, research that experimentally (or clinically) manipulates these beliefs is just beginning. As reviewed earlier, two recent experiments have induced entity beliefs about emotions in adults and assessed the downstream consequences on emotion regulation (Kneeland et al., in press-a, in press-b). One additional study extended this research into the clinical domain and found that individuals with social anxiety disorder who underwent Cognitive Behavioral Therapy (vs. waitlist control) felt more in control of their anxiety which, in turn, accounted for post-treatment decreases in social anxiety symptoms (De Castella et al., 2015). Overall, targeting entity beliefs about emotion is a promising way to understand and possibly improve psychological health, through prevention as well as intervention.

Limitations and Future Directions

This research makes a novel contribution to our understanding of beliefs about emotion, links to psychological health in developmental samples, and the mechanisms through which these beliefs shape psychological health. It also has limitations that suggest directions for future research.

First, although there is strong theoretical rationale and promising empirical support for the proposed model, experimental studies are needed to confirm the directionality of these links. Experimentally manipulating entity beliefs would not only provide evidence for the model proposed here, but would also lend key insight into pathways to improve people's psychological health. Research on entity beliefs in other domains (e.g., intelligence) suggests that these beliefs can be improved (Blackwell et al., 2007), and some preliminary research suggests that beliefs about specific emotions can be shifted using interventions (De Castella et al., 2015; Howell, Passmore, & Holder, in press). If entity beliefs about emotion can be improved in sustainable ways, individuals may be able to attain lasting improvements in psychological health. Importantly, while the present assessment of psychological health focused on depressive symptoms, these findings should generalize to other emotion-related indices of psychological health including other mood symptoms (e.g., anxiety) or well-being (e.g., satisfaction with life).

Second, the current studies examined 10-18 year olds, but future research would benefit from examining both younger and older samples. By targeting younger samples, we would learn more about when and how these beliefs develop. By targeting older samples, we would learn more about whether beliefs are stable after emerging adulthood or if shifts occur in the adult life span, such as in middle age or older adulthood. Older adults, for example, may believe that emotions are relatively more controllable as they gain perspective and wisdom (Grossmann et al., 2010).

Third, this investigation's primary focus was to examine whether and how entity beliefs about emotion predict worse psychological health, but they did not address where these beliefs might originate. There are at least two options worth investigating. First, entity beliefs may be

generated from the bottom-up. For example, a child who experiences intense and hard-to-manage emotions may draw the conclusion that emotions are relatively uncontrollable. Preliminary findings from Study 2 cast some doubt on the bottom-up hypothesis, given that initial experiences of depressive symptoms did not predict subsequent entity beliefs. However, some evidence from others suggests there may be some support for it (Schleider & Weisz, in press). A second option is that the beliefs are generated top-down. For example, children may hear explicit messages about the controllability of emotions from parents, teachers, or other children. They may also learn indirectly about the controllability of emotions by observing others struggle with versus effectively manage their emotions. Identifying how entity beliefs are generated could lend key insights into the most effective ways to shape these beliefs.

Fourth, the present investigation focused on children's general beliefs about whether emotions can be controlled, but more specific beliefs could be examined as well. For example, some research has also focused on beliefs about whether specific emotions can be controlled, like anxiety (De Castella et al., 2014) and happiness (Howell, Passmore, & Holder, 2015). Focusing on specific emotions may also allow for a better understanding of the gender differences in entity beliefs, given that gender socialization varies by emotion for children (e.g., parents elaborate more on sadness girls vs. boys; Fivush, Brotman, Buckner, & Goodman, 2000) which could in turn lead to gender differences in entity beliefs about specific emotions.

Fifth, although the present investigation focused on children's beliefs about whether emotions can be controlled, this may not be the only fundamental and influential belief that people hold about emotions. To thoroughly and fruitfully examine people's beliefs about emotion, it would be useful to develop a nomological net of beliefs. This net would describe superordinate beliefs about emotion, their subordinate beliefs, as well as the inter-relationships between these beliefs and their possibly differential links with health and functioning. For example, a growing literature has examined people's beliefs about whether emotions are good or bad (Ford & Mauss, 2014; Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011; Mikulincer & Ben-Artzi, 1995; Tamir, 2009; Tsai, 2007), which represents another superordinate belief about emotion. For the purposes of this paper, I focus on the superordinate entity belief, as a belief that should function independently from other superordinate beliefs and should have unique implications for emotion regulation and downstream psychological health. However, other beliefs may critically feed into entity beliefs – for example, people likely differ in their beliefs about where emotions come from (e.g., cognitive versus bodily reactions), which could influence whether individuals believe emotions are controllable (e.g., cognitive experiences may be considered more easily controllable). Further research should examine multiple superordinate beliefs together, how superordinate beliefs might shape subordinate beliefs, and how these beliefs may work separately or together to predict health and functioning.

Sixth, although the present investigation focused on two widely studied emotion regulation strategies, assessing other strategies is an important area of future research. I found that entity beliefs were uniquely linked with reappraisal but not suppression, suggesting that entity beliefs may be specifically linked with decrements in strategies that focus on changing internal emotional experiences. Reappraisal, however, can also be characterized as a strategy that is generally considered adaptive to use in the long-run (whereas suppression is not). To identify the active ingredient linking entity beliefs with reappraisal, it may be useful to examine additional strategies: For example, distraction can be used to effectively change internal emotional experiences, but is not necessarily considered an adaptive strategy to use in the long run (Sheppes & Gross, 2011). Conversely, emotional acceptance is defined by *not* trying to

change or control the internal emotional experiences, but is generally considered adaptive to use in the long run (Baer et al., 2008). Examining additional strategies would help triangulate the pattern and uncover what factors are driving the links between entity beliefs and emotion regulation.

Finally, although the present effect sizes were consistent across these studies and comparable to other work, they were small. This could suggest that there are key moderators and boundary conditions of the effects of entity beliefs. For example, under some conditions, believing an attribute is controllable and constantly striving to improve that attribute can foster worse outcomes (Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Indeed, under some conditions, entity beliefs may actually foster better outcomes (Park & Kim, 2015). For example, entity beliefs may have interpersonal benefits if believing emotions are relatively uncontrollable fosters empathy for close others who are struggling with overwhelming emotions. Many of these exciting ideas remain to be tested.

Concluding Comment

A small literature has begun to examine individuals' fundamental beliefs about emotion. Building on these early findings, the present research demonstrates that beliefs about whether emotions can or cannot be controlled are not merely intellectual musings – they are core individual differences that develop early in life and shape the emotion regulation process and subsequent psychological health.

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Footnotes

¹ These 142 children represent the full sample from the larger study (i.e., they are not a subsample). The larger study included additional scales (e.g., assessing individuals' goals, life events, and decision-making) that were not central to the present hypotheses.

² These 366 children represent the full Denver sample from the larger study (another sample was collected from the New Jersey area, but entity beliefs were not assessed in this sample). The larger study included additional measures (e.g., assessing individuals' goals, personality, life events, and relationships) that were not central to the present hypotheses.

³ The final sample did not significantly differ from the excluded participants on entity beliefs at T1 or T2, $ps > .66$, $\eta_p^2s < .001$, reappraisal at T1 or T2, $ps > .45$, $\eta_p^2s < .002$, suppression at T2, $p = .57$, $\eta_p^2 = .001$, or self-reported depressive symptoms at T0, T1, or T2, $ps > .073$, $\eta_p^2s < .011$. The final sample did differ from the excluded participants' parent-reported depressive symptoms at T0, T1, and T2, $ps < .008$, $\eta_p^2s > .025$, suggesting that parents who perceived their children were feeling worse may have not completed all necessary components of data collection. The final sample also used suppression significantly less at T1 than the excluded participants, $p = .010$, $\eta_p^2 = .025$.

⁴ This longitudinal study was initiated before the ERQ-CA (Emotion Regulation Questionnaire for Children and Adolescents; Gullone & Taffe, 2012), the scale used in Study 1, was published. For Study 2, the authors made subtle modifications to the original ERQ to create more youth-friendly items. Because this questionnaire and the ERQ-CA are both based closely on the original ERQ scale, the present questionnaire is very similar to the ERQ-CA. For example, this suppression item from the ERQ-CA, "*When I'm feeling bad (e.g., sad, angry, or worried), I am careful not to show it*" reads as follows in the Study 2 scale, "*When I'm feeling bad, sad, or angry, I do not show these feelings in my face or my behavior*".

⁵ Due to IRB concerns, one BDI item referencing suicidal ideation was removed.

Figure 1. Theoretical model wherein believing emotions cannot be controlled (entity beliefs about emotion) predicts less frequent use of emotion regulation strategies that focus on controlling emotional experiences (e.g., cognitive reappraisal), but not strategies that focus on controlling the expression of emotions (e.g., expressive suppression), which in turn predicts worse psychological health.

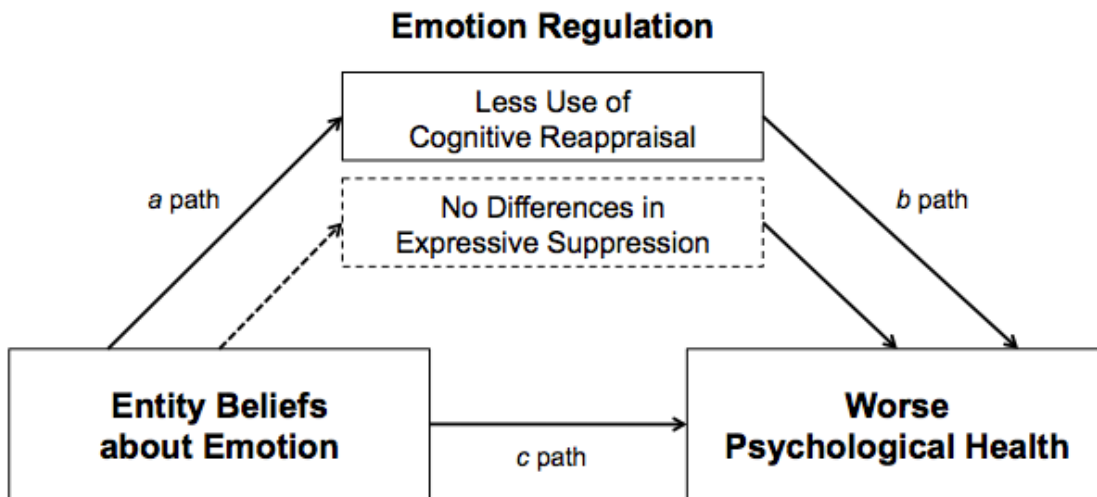


Table 1. Study 1: Descriptive statistics (mean, standard deviation, alpha) for primary study variables, as well as tests of age and gender differences in primary study variables.

Study 1 Descriptives (N=136)	
Entity Beliefs	
Mean (<i>SD</i>) [<i>alpha</i>]	3.60 (1.20) [.64]
Age	$r = .09, n.s.$
Gender	$t = 2.61^*$
Girls <i>M</i> (<i>SD</i>)	3.93 (1.05)
Boys <i>M</i> (<i>SD</i>)	3.39 (1.26)
Emotion Regulation: Cognitive Reappraisal	
Mean (<i>SD</i>) [<i>alpha</i>]	4.49 (1.10) [.82]
Age	$r = -.06, n.s.$
Gender	$t < 1, p = .655$
Girls <i>M</i> (<i>SD</i>)	4.54 (1.13)
Boys <i>M</i> (<i>SD</i>)	4.45 (1.08)
Emotion Regulation: Expressive Suppression	
Mean (<i>SD</i>) [<i>alpha</i>]	3.83 (1.50) [.84]
Age	$r = .04, n.s.$
Gender	$t = 2.25^*$
Girls <i>M</i> (<i>SD</i>)	3.47 (1.61)
Boys <i>M</i> (<i>SD</i>)	4.06 (1.39)
Depressive Symptoms	
Mean (<i>SD</i>) [<i>alpha</i>]	19.38 (8.55) [.83]
Age	$r = -.13, n.s.$
Gender	$t = 3.73^*$
Girls <i>M</i> (<i>SD</i>)	22.64 (10.39)
Boys <i>M</i> (<i>SD</i>)	17.29 (6.38)

Note. $*p < .05$. Entity beliefs and emotion regulation were rated on a scale of 1-7 and depressive symptoms were rated on a scale of 0-60.

Table 2. *Study 1: Pearson's r correlations between primary study variables.*

	Entity Beliefs	Emotion Regulation		Depressive Symptoms
		Cognitive Reappraisal	Expressive Suppression	
Entity Beliefs	–			
Emotion Regulation: Cognitive Reappraisal	-.17*	–		
Emotion Regulation: Expressive Suppression	.08	-.07	–	
Depressive Symptoms	.21*	-.23*	.26*	–

Note. * $p < .05$.

Table 3. Studies 1 and 2: Mediation analyses testing whether the link between youths' entity beliefs and depressive symptoms was mediated by reappraisal.

Outcome	<i>a</i> path Entity beliefs predicting reappraisal	<i>b</i> ' path Reappraisal predicting depressive symptoms (controlling for entity beliefs)	<i>c</i> ' path Entity beliefs predicting depressive symptoms (controlling for reappraisal)	Indirect effect	
				Statistics	Significant mediation?
Study 1					
<i>Youth-reported Depressive Symptoms</i>	B = -0.16, SE = 0.08 <i>t</i> (134) = 2.03, <i>p</i> = .044	B = -1.52, SE = 0.66 <i>t</i> (133) = 2.31, <i>p</i> = .022	B = 1.22, SE = 0.60 <i>t</i> (133) = 2.04, <i>p</i> = .043	B = 0.24, SE = 0.18 CI ₉₅ [.01, .77]	Yes, partial
Study 2					
<i>Youth-reported Depressive Symptoms</i>					
Assessed at T2	B = -0.17, SE = 0.06 <i>t</i> (225) = 2.89, <i>p</i> = .004	B = -1.54, SE = 0.28 <i>t</i> (224) = 5.58, <i>p</i> < .001	B = 0.48, SE = 0.25 <i>t</i> (224) = 1.90, <i>p</i> = .059	B = 0.27, SE = 0.13 CI ₉₅ [.06, .56]	Yes, full
Assessed at T2 (Controlling for T0)	B = -0.17, SE = 0.06 <i>t</i> (225) = 2.89, <i>p</i> = .004	B = -0.23, SE = 0.05 <i>t</i> (224) = 4.85, <i>p</i> < .001	B = 0.06, SE = 0.04 <i>t</i> (224) = 1.42, <i>p</i> = .157	B = 0.04, SE = 0.02 CI ₉₅ [.01, .09]	Yes, full
Assessed at T2 (Controlling for T1)	B = -0.17, SE = 0.06 <i>t</i> (225) = 2.89, <i>p</i> = .004	B = -0.18, SE = 0.05 <i>t</i> (224) = 3.60, <i>p</i> < .001	B = 0.02, SE = 0.04 <i>t</i> (224) < 1, <i>p</i> = .666	B = 0.03, SE = 0.02 CI ₉₅ [.01, .07]	Yes, full
<i>Parent-reported Youth Depressive Symptoms</i> †					
Assessed at T2	B = -0.17, SE = 0.06 <i>t</i> (225) = 2.89, <i>p</i> = .004	B = -1.11, SE = 0.26 <i>t</i> (224) = 4.22, <i>p</i> < .001	B = 0.51, SE = 0.24 <i>t</i> (224) = 2.12, <i>p</i> = .035	B = 0.19, SE = 0.10 CI ₉₅ [.05, .47]	Yes, partial
Assessed at T2 (Controlling for T0)	B = -0.17, SE = 0.06 <i>t</i> (225) = 2.89, <i>p</i> = .004	B = -0.22, SE = 0.05 <i>t</i> (224) = 4.26, <i>p</i> < .001	B = 0.10, SE = 0.05 <i>t</i> (224) = 2.18, <i>p</i> = .030	B = 0.04, SE = 0.02 CI ₉₅ [.02, .09]	Yes, partial
Assessed at T2 (Controlling for T1)	B = -0.18, SE = 0.06 <i>t</i> (223) = 2.89, <i>p</i> = .004	B = -0.21, SE = 0.05 <i>t</i> (222) = 4.00, <i>p</i> < .001	B = 0.07, SE = 0.05 <i>t</i> (222) = 1.45, <i>p</i> = .148	B = 0.04, SE = 0.02 CI ₉₅ [.01, .10]	Yes, full

Note. †All mediations with parent-reported child's depressive symptoms were significant when also controlling for parents' own depressive symptoms.

Table 4. Study 2: Descriptive statistics (mean, standard deviation, alpha) for primary study variables, as well as tests of school grade, pubertal status, and gender differences in primary study variables.

Study 2 Descriptives (N=227)			
	Time 0 (0 months)	Time 1 (18 months)	Time 2 (36 months)
Entity Beliefs			
Mean (SD) [<i>alpha</i>]	–	3.10 (1.29) [.62]	3.27 (1.22) [.63]
School grade	–	$F = 6.79^*$ (4 th < 7 th = 10 th)	$F = 4.54^*$ (4 th = 7 th < 10 th)
4 th <i>M</i> (SD)	–	2.68 (1.48)	3.00 (1.25)
7 th <i>M</i> (SD)	–	3.12 (1.24)	3.19 (1.25)
10 th <i>M</i> (SD)	–	3.47 (1.05)	3.60 (1.08)
Pubertal status	–	$t = 3.52^*$	$t = 2.70^*$
Pre-pubertal <i>M</i> (SD)	–	2.79 (1.39)	3.06 (1.24)
Post-pubertal <i>M</i> (SD)	–	3.39 (1.12)	3.51 (1.15)
Gender	–	$t = 3.05^*$	$t = 2.61^*$
Girls <i>M</i> (SD)	–	3.32 (1.30)	3.45 (1.21)
Boys <i>M</i> (SD)	–	2.80 (1.22)	3.02 (1.19)
Emotion Regulation: Cognitive Reappraisal			
Mean (SD) [<i>alpha</i>]	–	4.83 (1.21) [.82]	4.81 (1.18) [.89]
School grade	–	$F = 1.44, n.s.$	$F = 1.66, n.s.$
4 th <i>M</i> (SD)	–	4.92 (1.31)	4.83 (1.28)
7 th <i>M</i> (SD)	–	4.65 (1.26)	4.64 (1.13)
10 th <i>M</i> (SD)	–	4.95 (1.03)	4.99 (1.15)
Pubertal status	–	$t = 1.65, n.s.$	$t < 1, n.s.$
Pre-pubertal <i>M</i> (SD)	–	4.96 (1.22)	4.84 (1.19)
Post-pubertal <i>M</i> (SD)	–	4.69 (1.19)	4.76 (1.20)
Gender	–	$t = 1.10, n.s.$	$t < 1, n.s.$
Girls <i>M</i> (SD)	–	4.75 (1.23)	4.77 (1.22)
Boys <i>M</i> (SD)	–	4.93 (1.18)	4.87 (1.44)
Emotion Regulation: Expressive Suppression			
Mean (SD) [<i>alpha</i>]	–	3.47 (1.32) [.71]	3.74 (1.27) [.69]
School grade	–	$F < 1, n.s.$	$F < 1, n.s.$
4 th <i>M</i> (SD)	–	3.39 (1.39)	3.68 (1.07)
7 th <i>M</i> (SD)	–	3.61 (1.25)	3.86 (1.36)
10 th <i>M</i> (SD)	–	3.38 (1.34)	3.64 (1.32)
Pubertal status	–	$t = 1.78, n.s.$	$t = 1.41, n.s.$
Pre-pubertal <i>M</i> (SD)	–	3.61 (1.29)	3.85 (1.16)
Post-pubertal <i>M</i> (SD)	–	3.30 (1.33)	3.62 (1.31)
Gender	–	$t = 2.62^*$	$t = 2.79^*$
Girls <i>M</i> (SD)	–	3.28 (1.34)	3.54 (1.24)
Boys <i>M</i> (SD)	–	3.73 (1.35)	4.00 (1.25)

Depressive Symptoms: Youth self report

Mean (<i>SD</i>) [<i>alpha</i>]	6.07 (5.28) [.83]	4.70 (5.09) [.84]	4.83 (5.22) [.86]
	$F = 5.68^*$	$F = 6.07^*$	$F = 7.21^*$
School grade	(4 th = 7 th < 10 th)	(4 th = 7 th < 10 th)	(4 th < 7 th = 10 th)
4 th <i>M</i> (<i>SD</i>)	5.27 (4.71)	3.28 (4.33)	3.12 (3.95)
7 th <i>M</i> (<i>SD</i>)	5.28 (4.65)	4.52 (5.23)	4.84 (5.35)
10 th <i>M</i> (<i>SD</i>)	7.75 (6.10)	6.20 (5.23)	6.39 (5.64)
Pubertal status	$t = 2.36^*$	$t = 3.81^*$	$t = 4.25^*$
Pre-pubertal <i>M</i> (<i>SD</i>)	5.20 (5.33)	3.32 (3.94)	3.33 (4.10)
Post-pubertal <i>M</i> (<i>SD</i>)	6.88 (5.21)	5.79 (5.57)	6.18 (5.76)
Gender	$t < 1, n.s.$	$t = 1.13, n.s.$	$t = 2.25^*$
Girls <i>M</i> (<i>SD</i>)	6.35 (4.94)	5.02 (5.55)	5.50 (5.79)
Boys <i>M</i> (<i>SD</i>)	5.69 (5.71)	4.26 (4.39)	3.94 (4.19)

Depressive Symptoms: Parent report of youth

Mean (<i>SD</i>) [<i>alpha</i>]	6.43 (4.56) [.82]	5.34 (4.09) [.83]	4.01 (4.87) [.87]
	$F < 1$	$F = 2.95, n.s.$	$F = 1.51, n.s.$
School grade			
4 th <i>M</i> (<i>SD</i>)	6.15 (4.37)	4.82 (3.46)	3.15 (4.15)
7 th <i>M</i> (<i>SD</i>)	6.43 (4.73)	4.94 (2.97)	4.42 (5.43)
10 th <i>M</i> (<i>SD</i>)	6.69 (4.58)	6.29 (5.42)	4.32 (4.71)
Pubertal status	$t < 1, n.s.$	$t = 2.03^*$	$t = 1.91, n.s.$
Pre-pubertal <i>M</i> (<i>SD</i>)	6.14 (4.37)	4.76 (3.22)	3.38 (4.10)
Post-pubertal <i>M</i> (<i>SD</i>)	6.68 (4.75)	5.87 (4.74)	4.63 (5.50)
Gender	$t < 1, n.s.$	$t < 1, n.s.$	$t < 1, n.s.$
Girls <i>M</i> (<i>SD</i>)	6.21 (4.52)	5.35 (4.44)	4.22 (5.10)
Boys <i>M</i> (<i>SD</i>)	6.73 (4.63)	5.34 (3.59)	3.72 (4.54)

Note. $*p < .05$. There are no data available for cells with dashes (-); The sample size for Study 2 was 227 for all measures except for T1 parent-reported depressive symptoms (N=225) and T2 entity beliefs (N=217); Entity beliefs and emotion regulation were rated on a scale of 1-7 and depressive symptoms were rated on a scale of 0-54.

Table 5. Study 2: Pearson's *r* correlations between primary study variables.

	Time Point	Entity Beliefs		Emotion Regulation				Depressive Symptoms					
		Entity Beliefs		Cognitive Reappraisal		Expressive Suppression		Youth Self-report			Parent-report of Youth		
		T1	T2	T1	T2	T1	T2	T0	T1	T2	T0	T1	T2
Entity Beliefs	T1	–											
	T2	.37*	–										
Emotion Regulation: Cognitive Reappraisal	T1	-.21*	-.11*	–									
	T2	-.19*	-.31*	.33*	–								
Emotion Regulation: Expressive Suppression	T1	.06	.00	-.12	-.12	–							
	T2	.06	.01	-.13	-.01	.42*	–						
Depressive Symptoms: Youth self-report	T0	.14*	.18*	-.18*	-.22*	.06	.10	–					
	T1	.20*	.18*	-.32*	-.28*	.11	.15*	.51*	–				
	T2	.19*	.28*	-.26*	-.37*	.02	.14*	.46*	.63*	–			
Depressive Symptoms: Parent-report	T0	.02	.06*	-.11	-.05	.02	.11	.34*	.20*	.18*	–		
	T1	.12	.15*	-.13	-.12	.02	.11	.42*	.46*	.40*	.49*	–	
	T2	.19*	.10	-.14*	-.30*	-.05	.08	.32*	.23*	.43*	.41*	.53*	–

Note. * $p < .05$

Table 6. Study 2: Tests of whether youths' demographic features (school grade, pubertal status, gender) moderate the links between predictors (entity beliefs, reappraisal) and outcomes (reappraisal, depressive symptoms).

	School Grade		Pubertal Status		Gender		Pubertal Status X Gender	
	Interaction	Simple Effects	Interaction	Simple Effects	Interaction	Simple Effects	Interaction	Simple Effects
Link Between T1 Entity Beliefs & T2 Depressive Symptoms								
Youth-reported Symptoms	$F < 1$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-
(Controlling for T0 symptoms)	$F < 1$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-	$F = 1.32$ $\eta_p^2 = .01$	-
(Controlling for T1 symptoms)	$F = 2.00$ $\eta_p^2 = .02$	-	$F = 1.00$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-
Parent-reported Youth Symptoms	$F = 1.17$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-	$F = 1.09$ $\eta_p^2 = .01$	-	$F = 1.35$ $\eta_p^2 = .01$	-
(Controlling for T0 symptoms)	$F = 1.85$ $\eta_p^2 = .02$	-	$F < 1$ $\eta_p^2 = .00$	-	$F = 1.07$ $\eta_p^2 = .01$	-	$F = 1.99$ $\eta_p^2 = .01$	-
(Controlling for T1 symptoms)	$F = 1.28$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-	$F = 1.24$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-
Link Between T1 Beliefs & T2 Reappraisal	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-
Link Between T2 Reappraisal & T2 Depressive Symptoms								
Youth-reported Symptoms	$F = 2.28$ $\eta_p^2 = .02$	-	$F = 3.50$ $\eta_p^2 = .02$	-	$F = 7.14^*$ $\eta_p^2 = .03$	Girls: $r = -.46^*$ Boys: $r = -.20^*$	$F = 1.86$ $\eta_p^2 = .01$	-
(Controlling for T0 symptoms)	$F = 1.81$ $\eta_p^2 = .02$	-	$F = 4.96^*$ $\eta_p^2 = .02$	Pre: $r = -.23^*$ Post: $r = -.43^*$	$F = 5.36^*$ $\eta_p^2 = .02$	Girls: $r = -.41^*$ Boys: $r = -.17$	$F < 1$ $\eta_p^2 = .00$	-
(Controlling for T1 symptoms)	$F = 2.38$ $\eta_p^2 = .02$	-	$F = 2.58$ $\eta_p^2 = .01$	-	$F = 1.50$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-
Parent-reported Youth Symptoms	$F = 5.36^*$ $\eta_p^2 = .05$	4 th : $r = -.05$ 7 th : $r = -.29^*$ 10 th : $r = -.55^*$	$F = 13.02^*$ $\eta_p^2 = .06$	Pre: $r = -.07$ Post: $r = -.46^*$	$F = 2.05$ $\eta_p^2 = .01$	-	$F < 1$ $\eta_p^2 = .00$	-
(Controlling for T0 symptoms)	$F = 3.00$ $\eta_p^2 = .03$	-	$F = 11.78^*$ $\eta_p^2 = .05$	Pre: $r = -.08$ Post: $r = -.48^*$	$F < 1$ $\eta_p^2 = .00$	-	$F < 1$ $\eta_p^2 = .00$	-
(Controlling for T1 symptoms)	$F = 3.74^*$ $\eta_p^2 = .03$	4 th : $r = -.04$ 7 th : $r = -.30^*$ 10 th : $r = -.48^*$	$F = 14.61^*$ $\eta_p^2 = .06$	Pre: $r = -.03$ Post: $r = -.46^*$	$F = 1.80$ $\eta_p^2 = .01$	-	$F = 1.07$ $\eta_p^2 = .01$	-

Note. $*p < .05$. Pre = Pre-pubertal; Post = Post-pubertal. All analyses with parent-reported youths' depressive symptoms remain comparable when also controlling for parents' own depressive symptoms with the following exception: When controlling for parental depressive symptoms, school grade did not significantly moderate the link between T2 reappraisal and any measure of T2 parent-reported youths' depressive symptoms.